TEXAS GENERAL LAND OFFICE
GEORGE P. BUSH, COMMISSIONER

January 31, 2020

Tennille Parker
Director, Disaster Recovery and Special Issues Division
Office of Block Grant Assistance
U.S. Department of Housing and Urban Development
451 7th Street S.W.
Washington, DC 20410

RE: State of Texas CDBG Mitigation (CDBG-MIT) Action Plan: Building Stronger for a Resilient Future

Dear Ms. Parker:

The Texas General Land Office is pleased to present the *State of Texas CDBG Mitigation (CDBG-MIT) Action Plan: Building Stronger for a Resilient Future* (the Action Plan). The Action Plan is for $4,297,189,000 in Community Development Block Grant Mitigation (CDBG-MIT) funds. The state of Texas was allocated these funds through the publication of HUD's notice in the Federal Register, 84 FR 45838 (August 30, 2019).

The Action Plan was released on November 21, 2019. The public comment period for the Action Plan was from November 22, 2019 to January 10, 2020. A press release and an email notification of the public comment period was sent to low-income housing advocates and community organizations representing homeless and special needs populations, as well as all mayors, county judges, and tribal leaders in the declared areas. The Action Plan was available in English, Spanish, Chinese, Arabic, Vietnamese, and Korean.

If you need any additional information about the Action Plan, please contact Heather Lagrone at heather.lagrone.glo@recovery.texas.gov

Sincerely,

Alexandra Gamble

Alexandra Gamble
Director, Policy Development
Community Development and Revitalization

State of Texas CDBG Mitigation (CDBG-MIT) Action Plan:

Building Stronger for a Resilient Future

Texas General Land Office

George P. Bush, Commissioner

Published: November 22, 2019

Public Comment Period:
November 22, 2019 - January 10, 2020

HUD Approved:

Further Additional Supplemental Appropriations for Disaster Relief Requirements Act, 2018
84 FR 45838 (August 30, 2019)

TABLE OF CONTENTS

1 Executive Summary 1

1.1 Executive Summary – Total Allocation Budget 4

2 Mitigation Needs Assessment – State of Texas 5

2.1 Cumulative Impacts of Disasters 5

2.1.1 The 2015 Floods 5

2.1.2 The 2016 Floods 9

2.1.3 Hurricane Harvey 13

2.1.4 2018 & 2019 Floods and Tropical Storm 19

2.2 CDBG Mitigation 20

2.3 Resiliency Solutions and Mitigation Priorities 23

2.4 Demographic Profile of Impacted Counties 24

2.5 Low- and Moderate-Income Analysis 27

2.6 State Risks and Hazards Assessment 28

2.6.1 State of Texas Hazard Mitigation Plan 2018 29

2.6.2 FEMA Community Lifelines 30

2.6.3 Hurricanes, Tropical Storms, and Depressions 32

2.6.4 FEMA's Community Lifelines for Hurricanes, Tropical Storms, and Depressions 37

2.6.5 Severe Coastal and Riverine Flooding 54

2.6.6 FEMA's Community Lifelines for Severe Coastal and Riverine Flooding 56

2.6.7 Drought 67

2.6.8 FEMA's Community Lifelines for Drought 69

2.6.9 Hailstorms 76

2.6.10 FEMA's Community Lifelines for Hailstorms 77

2.6.11 Tornadoes 83

2.6.12 FEMA's Community Lifelines for Tornadoes 84

2.6.13 Severe Winds 93

2.6.14 FEMA's Community Lifelines for Severe Winds 94

2.6.15 Wildfire 101

2.6.16 FEMA's Community Lifelines for Wildfire 102
2.6.17 Winter Weather 112
2.6.18 FEMA's Community Lifelines for Winter Weather 112
2.6.19 Lightning 120
2.6.20 FEMA's Community Lifelines for Lightning 122
2.6.21 Extreme Cold 127
2.6.22 FEMA's Community Lifelines for Extreme Cold 128
2.6.23 Extreme Heat 133
2.6.24 FEMA's Community Lifelines for Extreme Heat 133
2.6.25 Additional Natural Hazards 140
2.7 Hazards by County 144
2.7.1 Composite Disaster Index Overview 144
2.7.2 CDI Methodology 144
2.7.3 Hazard Categories 145
2.7.4 Composite Disaster Index Result 153
2.8 Social Vulnerability Index 155
2.9 Per Capita Market Value 157
2.10 Review of State Reports, Studies, and Legislation 159
2.10.1 The Texas Coastal Resiliency Master Plan 159
2.10.2 Governor's Commission to Rebuild Texas 162
2.10.3 Texas at Risk Report 162
2.10.4 86th Texas Legislature 163
2.10.5 State Studies 172
2.10.6 Additional Hurricane Harvey Studies 175
2.10.7 Other GLO Studies and Initiatives 177
2.10.8 Federal, State, and Local Coordination & Mitigation Alignment 179
3 General Requirements 190
3.1 Coordination of Mitigation Projects and Leverage 190
3.2 Displacement of Persons and/or Entities 190
3.3 Maximum Assistance 191

3.4 Natural Infrastructure 191
3.5 Protection of People and Property 192
3.5.1 Quality Construction Standards 192
3.5.2 Housing Contractors Standards 192
3.6 Operation and Maintenance Plans 193
3.7 Cost Verification 193
3.8 Elevation Standards 193
3.9 Appeals Processes 194
3.10 Dam and Levee Requirements 195
3.11 Program Income 195
3.12 Monitoring Standards 195
3.13 Broadband Infrastructure 196
3.14 Section 3 Compliance 196
4 State Administered Mitigation Program 197
4.1 Action Plan 197
4.2 Connection to Mitigation Needs Assessment 197
4.3 Program Budget 202
4.4 GLO Use of Funds 203
4.4.1 2015 Floods State Mitigation Competition 203
4.4.2 2016 Floods State Mitigation Competition 210
4.4.3 Hurricane Harvey State Mitigation Competition 217
4.4.4 Regional Mitigation Program (COG MODs) 225
4.4.5 Hazard Mitigation Grant Program (HMGP): Supplemental 232
4.4.6 Coastal Resiliency Program 239
4.4.7 Housing Oversubscription Supplemental 243
4.4.8 Resilient Home Program 249
4.4.9 Hazard Mitigation Plans 255
4.4.10 Resilient Communities Program 257
4.4.11 Regional and State Planning 262
4.4.12 Administrative Funds 264

4.5 Location 265
4.6 National Objectives 265
5 Citizen Participation – State Mitigation Action Plan 266
5.1 Public Hearings 266
5.2 Publication 269
5.3 Consideration of Public Comments 270
5.4 Citizen Advisory Committee 270
5.5 Citizen Complaints 270
5.6 Substantial Amendment 270
5.7 Non-substantial Amendment 271
5.8 Community Consultation 271
5.9 Public Website 271
5.9.1 Councils of Governments Websites for Regional Mitigation Program MODs 272
5.10 Application Status and Transparency 273
5.11 Waivers 273
6 Appendices 274
6.1 Appendix A: CDBG-MIT Eligible and Most Impacted and Distressed (MID) Counties and ZIP Codes 274
6.2 Appendix B: Certifications – State of Texas 278
6.3 Appendix C: Program Expenditures 281
6.4 Appendix E: Consultations – State of Texas 289
6.4.1 Mitigation Survey 289
6.4.2 Consultations 298
6.5 Appendix F: Regional Methods of Distribution 306
6.5.1 Council of Governments Method of Distribution Methodology 306
6.6 Appendix G: Public Comment – State of Texas 310

TABLE OF FIGURES

Figure 1-1: CDBG-MIT Eligible Areas 3

Figure 2-1: Fischer Store Road Bridge Over the Blanco River. 6

Figure 2-2: 2015 Floods Declared Counties 7

Figure 2-3: Hydrography for Blanco River at Wimberley. 8

Figure 2-4: Burr's Ferry Bridge SH 63 over the Sabine River. 10

Figure 2-5: 48-hour rainfall estimates for Southeast Texas April 18-19, 2016. 11

Figure 2-6: 2016 Floods County Declarations 13

Figure 2-7: Track of Hurricane Harvey. 14

Figure 2-8: Hurricane Harvey Eligible Counties (UPDATE PL 115-123) 15

Figure 2-9: Residential and Commercial Windstorm and Flood Damage Insurance Claims 16

Figure 2-10: Texas Army National Guard and Texas Task Force One, Port Arthur. 17

Figure 2-11: National Weather Service's 5-Day Point Rainfall in Inches. 18

Figure 2-12: 2018 & 2019 Disaster Declared Counties 19

Figure 2-13: Risk 20

Figure 2-14: The Aspects of Mitigation 21

Figure 2-15: Benefit-Cost Ratio of Mitigation 22

Figure 2-16: Percentage of LMI Population by Block Group 27

Figure 2-17: Timeline: Hurricanes/Storms Impacting Texas 2000 – 2019 34

Figure 2-18: Galveston, Texas, during Hurricane Ike in 2008. 35

Figure 2-19: Members of the South Carolina's Helicopter Aquatic Rescue Team and the Texas Task Force perform rescue operations in Port Arthur during Harvey. 37

Figure 2-20: Texas National Guard members work with local responders in Victoria, Texas, during Hurricane Harvey. 38

Figure 2-21: Bolivar Peninsula, Texas, after Hurricane Ike. 41

Figure 2-22: Flooding in Port Arthur, Texas, during Hurricane Harvey. 42

Figure 2-23: City of Conroe's wastewater treatment plant during Hurricane Harvey. 45

Figure 2-24: Evacuations during Hurricane Rita in Spring, Texas. 48

Figure 2-25: Hurricane Harvey floodwaters approach Ben Taub Hospital in Houston. 50

Figure 2-26: Downed utility lines near Taft, Texas, during Hurricane Harvey. 53

Figure 2-27: Riverine flooding along the Brazos River during the May 2015 Floods. 54

Figure 2-28: Storm Surge Explained..... 55

Figure 2-29: Texas Army National Guard members and local first responders saving individuals in Granbury, Texas, during the 2015 Floods..... 57

Figure 2-30: Laredo, Texas, during 2010 Flooding. 59

Figure 2-31: Flooded homes in Wharton during the 2016 Floods. 60

Figure 2-32: City of Austin Water Department Twitter account, “city-wide boil water notice,” October 2018 Flooding. 61

Figure 2-33: Collapsed RM 2900 Bridge Detour Map, October 2018 Llano River Flood..... 63

Figure 2-34: September 6, 2011, U.S. Drought Monitor 68

Figure 2-35: The Blanco River during the 2011 drought. The Blanco River supplies water to nearby communities and ranches. 71

Figure 2-36: Texas corn crops during 2013 severe drought conditions. 72

Figure 2-37: Hail Sizes by Inches 76

Figure 2-38: East Dallas neighborhood during June 2012 hailstorm. 78

Figure 2-39: Hail damage after a March 2019 storm in the DFW area. 80

Figure 2-40: Hail damage to residential solar panels. 82

Figure 2-41: Residential neighborhood after EF3 tornado hit Van, Texas, in 2015. 86

Figure 2-42: Residential tornado damage in Cherokee County, April 2019 tornadoes. 89

Figure 2-43: Destroyed home in Canton, April 2017 tornadoes. 90

Figure 2-44: Tornado damage in Franklin, April 2019. 92

Figure 2-45: Wind Zones in the United States..... 94

Figure 2-46: Uprooted tree-damaged sidewalk infrastructure and blocked roadway in Dallas, June 2019, following severe winds associated with thunderstorms. 97

Figure 2-47: Overturned semi truck outside Amarillo following severe wind in June 2018... 99

Figure 2-48: Texas National Guard assists with the 2011 Possum Kingdom Wildfire. 104

Figure 2-49: Homes on fire during the Possum Kingdom Wildfire in 2011. 106

Figure 2-50: Evacuations from Steiner Ranch in Travis County, 2011 Wildfire. 108

Figure 2-51: Bastrop County Complex fire smoke from Highway 71, 2011..... 111

Figure 2-52: Jackknifed semi-trucks..... 116

Figure 2-53: Vehicles stuck in snowdrifts near Amarillo during February 2013 blizzard. ... 117

Figure 2-54: Downed power line during the 2013 ice storm in Paris, Texas..... 119
Figure 2-55: Locations of lightning strikes in Texas (2005-2016) 120
Figure 2-56: Crews work to repair the Carrollton DART rail line damaged by lightning..... 124
Figure 2-57: Lightning ignited oil tanks in Burleson County in 2018. 126
Figure 2-58: NOAA Wind Chill Chart..... 127
Figure 2-59: Snow and ice covered AT&T Stadium in Arlington, February 2011. 130
Figure 2-60: Heat and Humidity Danger 137
Figure 2-61: Arkema chemical plant explosion in Crosby in 2017. 138
Figure 2-62: NFIP Repetitive Loss Properties per Square Mile (2001-2018) 146
Figure 2-63: Hurricane Winds per Square Mile by County (2001-2017)..... 147
Figure 2-64: Wildfires per Square Mile by County (2001–2018)..... 148
Figure 2-65: Flood Crests per Square Mile by County (2001-2017)..... 149
Figure 2-66: Tornadoes per Square Mile by County (2001-2017) 150
Figure 2-67: Drought: Weeks per Square Mile by County (2001-2018)..... 151
Figure 2-68: Hailstorms per Square Mile by County (2001-2018)..... 152
Figure 2-69: Composite Disaster Index (2001-2018) 154
Figure 2-70: Social Vulnerability Index for CDBG-MIT Eligible Counties 156
Figure 2-71: Per Capita Market Value by County (2018 Valuations) 158
Figure 2-72: The Four Regions of the Texas Coastal Zone 159
Figure 2-73: The Multiple Lines of Defense..... 160
Figure 2-74: Coastal River Basins and Waterways..... 174
Figure 2-75: Database Design..... 176
Figure 2-76: Surge reduction 100-year event in 2085. 178
Figure 2-77: County Hazard Mitigation Plan Status by County 182
Figure 2-78: Texas Councils of Governments 188
Figure 4-1: Program Budget 202
Figure 6-1: Eligible CDBG-MIT Counties..... 274
Figure 6-2: CDBG-MIT Most Impacted ZIP Codes..... 275
Figure 6-3: Projected Expenditures by Program..... 287
Figure 6-4: Remaining Funds Timeline..... 288

Figure 6-5: SoVI Factors 308

TABLE OF TABLES

Table 2-1: Demographic Statistics for Texas and the 140 CDBG-MIT Eligible Counties, 2017 American Communities Survey 25
Table 2-2: Top Natural Hazards in Texas 29
Table 2-3: FEMA Community Lifelines and Components 31
Table 2-4: Saffir-Simpson Wind Speed Scale 32
Table 2-5: Seven Wettest Hurricanes in U.S. History 33
Table 2-6: Enhanced Fujita Scale with Expected Damages 83
Table 2-7: Fire Intensity Scale (FIS) Classes 102
Table 2-8: Forms of Lightning 121
Table 2-9: Additional Natural Hazard Definitions 140
Table 2-10: CDI Hazard Types 145
Table 4-1: CDBG-MIT Most Impacted and Distressed Counties (HUD MID) 198
Table 4-2: 2015 Floods Competition Scoring Criteria 207
Table 4-3: 2016 Floods Scoring Criteria 214
Table 4-4: Hurricane Harvey Competition Scoring Criteria 222
Table 5-1: Mitigation Public Hearing Schedule 267
Table 6-1: CDBG-MIT Eligible Counties by Declared Disaster 276
Table 6-2: Timeline of Expenditures by Program 281
Table 6-3: 2019 GLO Mitigation Outreach Efforts 298
Table 6-4: CDI Hazard Weights 307
Table 6-5: Commenters 310

1 EXECUTIVE SUMMARY

The Further Additional Supplemental Appropriations for Disaster Relief Requirements Act, 2018 (Division B, Subdivision 1 of the Bipartisan Budget Act of 2018, Pub. L. 115-123, approved February 9, 2018), made available $28 billion in Community Development Block Grant disaster recovery (CDBG-DR) funds, and directed the U.S. Department of Housing and Urban Development (HUD) to allocate not less than $12 billion for mitigation activities proportional to the amounts that CDBG-DR grantees received for qualifying disasters in 2015, 2016, and 2017.

HUD allocated $4,297,189,000 in CDBG mitigation (CDBG-MIT) funds to the state of Texas through their notice published in the Federal Register, 84 FR 45838 (August 30, 2019) (the Notice). The Texas General Land Office (GLO) has been designated by Governor Greg Abbott to administer CDBG-MIT funds on behalf of the state of Texas.

CDBG-MIT funds represent an opportunity to fund and carry out strategic and high-impact activities to mitigate disaster risks and reduce future losses in areas impacted by recent disasters. In their Federal Register notice, HUD defines mitigation as: "Those activities that increase resilience to disasters and reduce or eliminate the long-term risk of loss of life, injury, damage to and loss of property, and suffering and hardship, by lessening the impact of future disasters."

Texans are at risk of significant natural disasters. According to the State of Texas Hazard Mitigation Plan (SHMP), Texas leads the nation in disaster declarations. The recent 2015 Floods, 2016 Floods, and Hurricane Harvey illustrate these risks.

The flooding events in 2018 and 2019, as well as Tropical Storm Imelda, further demonstrate that Texans have been and continue to be at risk of hazards such as hurricanes, tropical storms, depressions, and flooding. These funds will prove to be a long-lasting investment that increases the resiliency of communities throughout the state.

The State of Texas CDBG Mitigation Action Plan (the Action Plan) was developed to meet the HUD requirements outlined in the Notice. The Action Plan consists of a Mitigation Needs Assessment, a detailed use of funds, and an allocation budget.

The Mitigation Needs Assessment (the Assessment) was developed using the most recently updated SHMP (October 2018) to identify natural hazards; it provides a rationale for the state's programs. This Assessment demonstrates that:

- Flooding, hurricanes, tropical storms, and tropical depressions have the greatest impact in Texas;
- Housing, infrastructure, and businesses are continuously impacted and are at risk; and

- A variety of disasters can happen at any time and any place in Texas.

The Action Plan details the proposed use of all funds, including eligibility criteria, eligible applicants, and maximum award amounts. All state mitigation activities are required to address risks identified in areas affected by the 2015 Floods, 2016 Floods, and Hurricane Harvey.

Through this Action Plan, the GLO allocates funds to local governments and other eligible applicants for local and regional mitigation projects and mitigation planning. The GLO will implement state-run housing programs to reconstruct primary residences damaged by Hurricane Harvey with an eye toward increased resiliency.

This Action Plan considers and addresses critical mitigation needs over a large geographic area while maintaining as much local control as possible through several programs aimed at creating more resilient communities through improved infrastructure, housing, building and land use policies and practices, and hazard mitigation planning. Based on the Assessment, stakeholder outreach, past planning and recovery efforts, and public input, the GLO has created the following mitigation programs:

i. 2015 Floods State Mitigation Competition
ii. 2016 Floods State Mitigation Competition
iii. Hurricane Harvey State Mitigation Competition
iv. Regional Mitigation Program (COG MODs)
v. Hazard Mitigation Grant Program (HMGP): Supplemental
vi. Coastal Resiliency Program
vii. Housing Oversubscription Supplemental
viii. Resilient Home Program
ix. Hazard Mitigation Plans
x. Resilient Communities Program
xi. Regional and State Planning

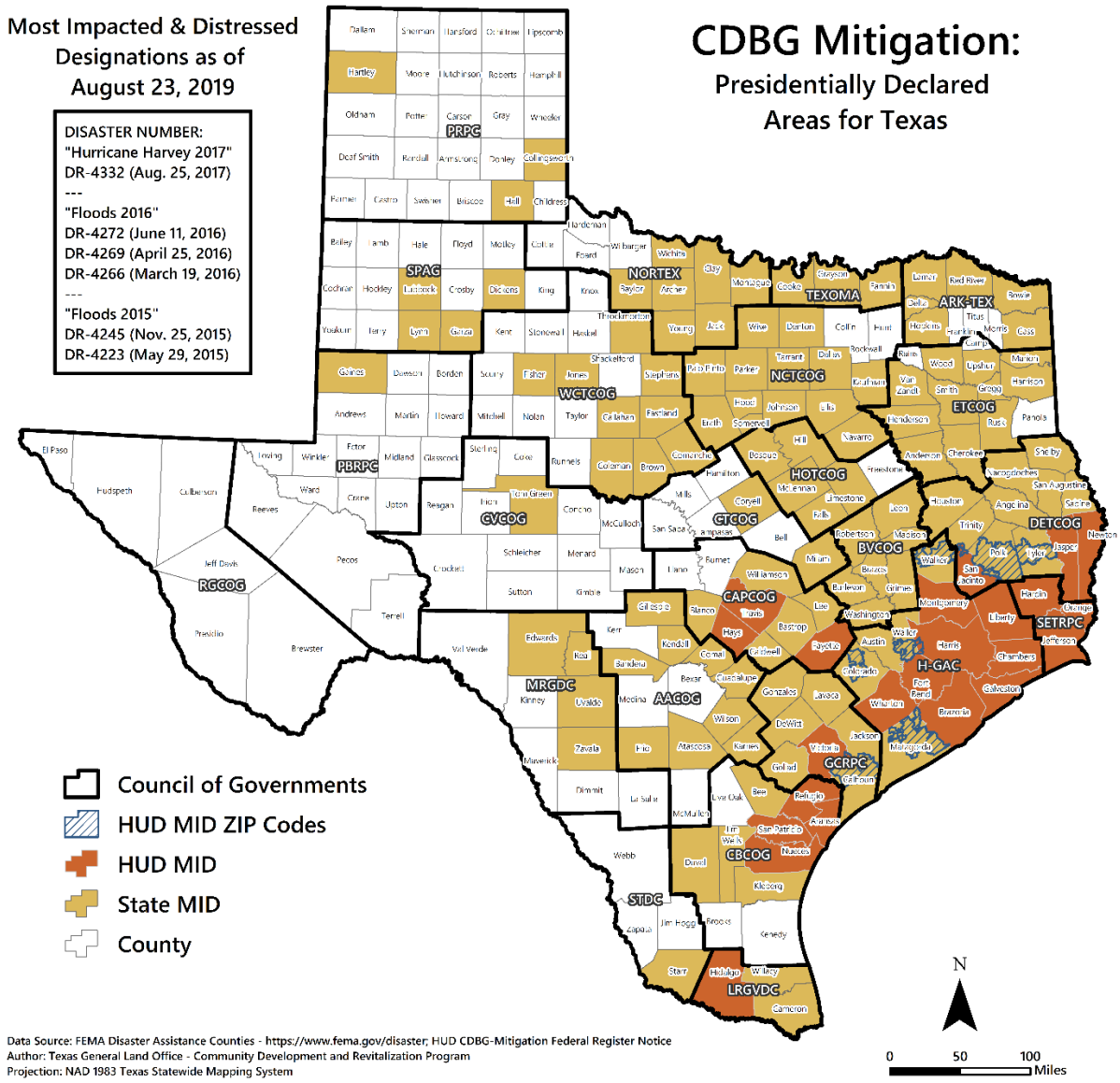
As required by the Notice, at least 50 percent of CDBG-MIT funds must be used to support activities that benefit LMI persons, and all programs will have an LMI priority.

HUD has identified Aransas, Brazoria, Chambers, Fayette, Fort Bend, Galveston, Hardin, Harris, Hays, Hidalgo, Jasper, Jefferson, Liberty, Montgomery, Newton, Nueces, Orange, Refugio, San Jacinto, San Patricio, Travis, Victoria, and Wharton Counties; 75979, 77320, 77335, 77351, 77414, 77423, 77482, 77493, 77979, and 78934 ZIP Codes as the "most impacted and distressed" areas (HUD MID) the Federal Register notice, 84 FR 45838 (August 30, 2019), and has required that at least 50 percent of the allocation must address identified risks within these areas. Up to 50

percent may address identified risks within the "most impacted and distressed" areas determined by the GLO.

Appendix A identifies the counties that received a federal disaster declaration in 2015 (DR-4223 and 4245), 2016 (DR-4266, DR-4269 and DR-4272), and Hurricane Harvey (DR-4332) and that were also identified as HUD MID Counties and ZIP Codes.

Figure 1-1: CDBG-MIT Eligible Areas



1.1 Executive Summary – Total Allocation Budget

Programs	HUD Most Impacted and Distressed	State Most Impacted and Distressed	Total Allocation	% of Total Allocation	LMI Amount
2015 Floods State Mitigation Competition	$ 23,048,475	$ 23,048,475	$ 46,096,950	1.07%	$ 23,048,475
2016 Floods State Mitigation Competition	$ 73,840,380	$ 73,840,380	$ 147,680,760	3.44%	$ 73,840,380
Hurricane Harvey State Mitigation Competition	$ 1,072,388,360	$ 1,072,388,360	$ 2,144,776,720	49.91%	$ 1,072,388,360
Regional Mitigation Program	$ 400,000,000	$ 100,000,000	$ 500,000,000	11.64%	$ 250,000,000
AACOG	$ -	$ 12,805,000	$ 12,805,000	2.56%	$ 6,402,500
BVCOG	$ -	$ 10,729,000	$ 10,729,000	2.15%	$ 5,364,500
CAPCOG	$ 10,765,000	$ 11,623,000	$ 22,388,000	4.48%	$ 11,194,000
CBCOG	$ 64,057,000	$ 12,870,000	$ 76,927,000	15.39%	$ 38,463,500
CTCOG	$ -	$ 2,900,000	$ 2,900,000	0.58%	$ 1,450,000
DETCOG	$ 54,829,000	$ 14,384,000	$ 69,213,000	13.84%	$ 34,606,500
GCRPC	$ 18,273,000	$ 16,139,000	$ 34,412,000	6.88%	$ 17,206,000
HGAC	$ 190,860,000	$ 18,550,000	$ 209,410,000	41.88%	$ 104,705,000
SETRPC	$ 61,216,000	$ -	$ 61,216,000	12.24%	$ 30,608,000
HMGP: Supplemental	$ 85,000,000	$ 85,000,000	$ 170,000,000	3.96%	$ 85,000,000
Coastal Resiliency Program	$ 100,000,000	$ -	$ 100,000,000	2.33%	$ 50,000,000
Housing Oversubscription Supplemental	$ 320,000,000	$ 80,000,000	$ 400,000,000	9.31%	$ 280,000,000
Resilient Home Program	$ 80,000,000	$ 20,000,000	$ 100,000,000	2.33%	$ 70,000,000
State Project Delivery	$ 64,457,835	$ 64,457,835	$ 128,915,670	3.00%	$ 64,457,835
Hazard Mitigation Plans	$ 15,000,000	$ 15,000,000	$ 30,000,000	0.70%	N/A
Resilient Communities Program	$ 50,000,000	$ 50,000,000	$ 100,000,000	2.33%	N/A
Regional and State Planning	$ 107,429,725	$ 107,429,725	$ 214,859,450	5.00%	N/A
State Administration	$ 107,429,725	$ 107,429,725	$ 214,859,450	5.00%	N/A
Total	$ 2,498,594,500	$ 1,798,594,500	$ 4,297,189,000	100%	$ 1,968,735,050

2 MITIGATION NEEDS ASSESSMENT – STATE OF TEXAS

The state of Texas completed the following Mitigation Needs Assessment (the Assessment) to identify long-term needs and priorities for CDBG-MIT funding allocated as a result of 2015, 2016, and 2017 Texas disasters. This Assessment takes into account a comprehensive set of data sources that cover multiple geographies and sectors and was completed according to guidelines set forth by HUD in its first CDBG-MIT Federal Register notice, 84 FR 45838 (August 30, 2019).

The information contained in the Assessment focuses on the statewide impacts and the impacts on the 140 CDBG-MIT eligible counties (see list in Appendix A). The information was compiled using federal and state sources, including information from FEMA, Texas Division of Emergency Management (TDEM), and other federal, state, and local agencies and data sources.

The GLO was able to gather information regarding the impacts of the 2015 and 2016 Floods and Hurricane Harvey; actions taken during and following the storms; and the risks and impacts on impacted communities. This Assessment includes specific details about needs in the eligible and most impacted and distressed communities. This includes risks to and impact on housing and infrastructure.

This Assessment has five main sections: (1) Impact of Prior Disasters; (2) Resiliency Solutions and Mitigation Priorities; (3) State Risks and Hazards Assessment; (4) A Review of State Reports, Studies, and Legislation; and (5) Hazards by County. Each section illustrates the variety of risks and immense impacts Texas communities face from natural hazards—particularly from flooding, hurricanes, tropical storms, and depressions. In demonstrating these risks and impacts, this Assessment provides a rationale for the state-administered mitigation programs detailed in the following chapters.

2.1 Cumulative Impacts of Disasters

2.1.1 THE 2015 FLOODS

On the nights of May 24–26, 2015, a slow-moving storm system dropped a tremendous amount of rain across much of Texas. The storm was preceded by more than a week of heavy rain that culminated in record-breaking floods in areas that historically had not previously flooded (the National Weather Service has cited May 2015 as one of the wettest months in Texas history).[1] Many areas reported tornado activity and record lightning strikes. The cities of Wimberley and

[1] "Weather Event Summary: 2015 Memorial Day Weekend Flooding," Austin/San Antonio Weather Forecast Office, National Weather Service, NOAA, https://www.weather.gov/media/ewx/wxevents/ewx-20150524.pdf

San Marcos in Hays County were particularly hard hit; countywide, 321 homes were destroyed, with hundreds more heavily damaged.[2] The Blanco River covered portions of Interstate 35.

During the first part of May, many locations across the state received well above normal rainfall that saturated soils. When the Memorial Day weekend arrived, much of the region was at least 2–4 inches (100–300 percent) above average. These conditions led to additional rains running off directly into rivers, streams, and flash flood prone areas. Across Bandera, Kerr, Kendall, Blanco and far west portions of Comal and Hays Counties 6-8 inches of rain fell with a maximum of 10 to 13 inches of rain falling across southern Blanco and northeast Kendall Counties. The majority of this rain fell from Saturday afternoon into the overnight hours of early Sunday morning, leading to the rapid rise of the Blanco and San Marcos Rivers. The Blanco River at Wimberley rose from near 5 feet at 9 p.m. to near 41 feet by 1 a.m. One staggering statistic is that the river rose 5 feet every 15 minutes from 10:45 p.m. to 11:45 p.m. This equates to a 20-foot rise along the river within a 1-hour timeframe (Figure 3-1).[3]

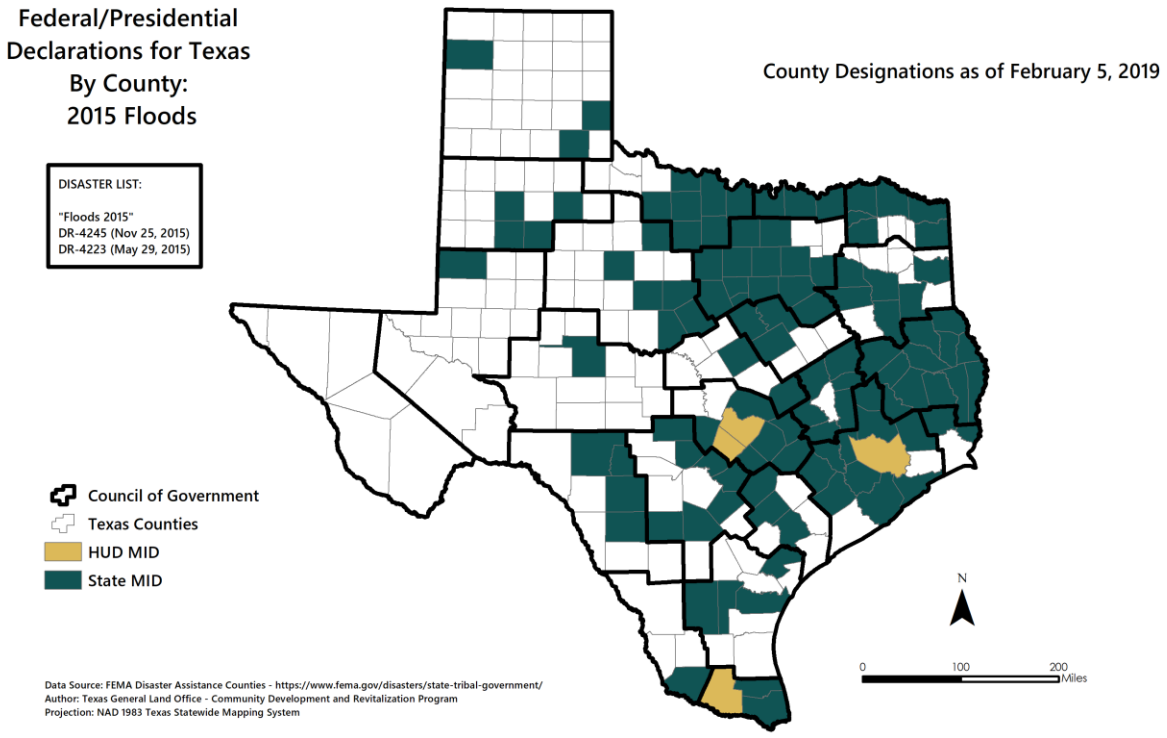
Figure 2-1: Fischer Store Road Bridge Over the Blanco River.[4]

[2] "Event Narrative," Wimberley Fire Department/Rescue, Storm Events Database, NOAA, https://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=581658
[3] "Weather Event Summary: 2015 Memorial Day Weekend Flooding," Austin/San Antonio Weather Forecast Office, National Weather Service, NOAA, https://www.weather.gov/media/ewx/wxevents/ewx-20150524.pdf
[4] Photograph by Michael Nyman, USGS, May 31, 2015, https://www.usgs.gov/media/images/memorial-day-flood-texas

Areas of Texas saw more than 20 inches of rainfall in a matter of days. About 8 million-acre feet of water flowed into the state's reservoirs. Within 48 hours, enough water fell to supply the needs of a city of 8 million people for 1 year. The amount of water that fell over the 30-day period would put the state of Rhode Island under 10 feet of water, fulfill New York City's water needs for 7 full years, or fill Lake Mead, the largest reservoir in the U.S., twice over.[5]

The May floods killed 31 people—27 in Texas and 4 in Oklahoma.[6] The President issued a major disaster declaration (FEMA-4223-DR) on May 29, 2015, after multiple state disaster declarations from the governor's office.

Figure 2-2: 2015 Floods Declared Counties



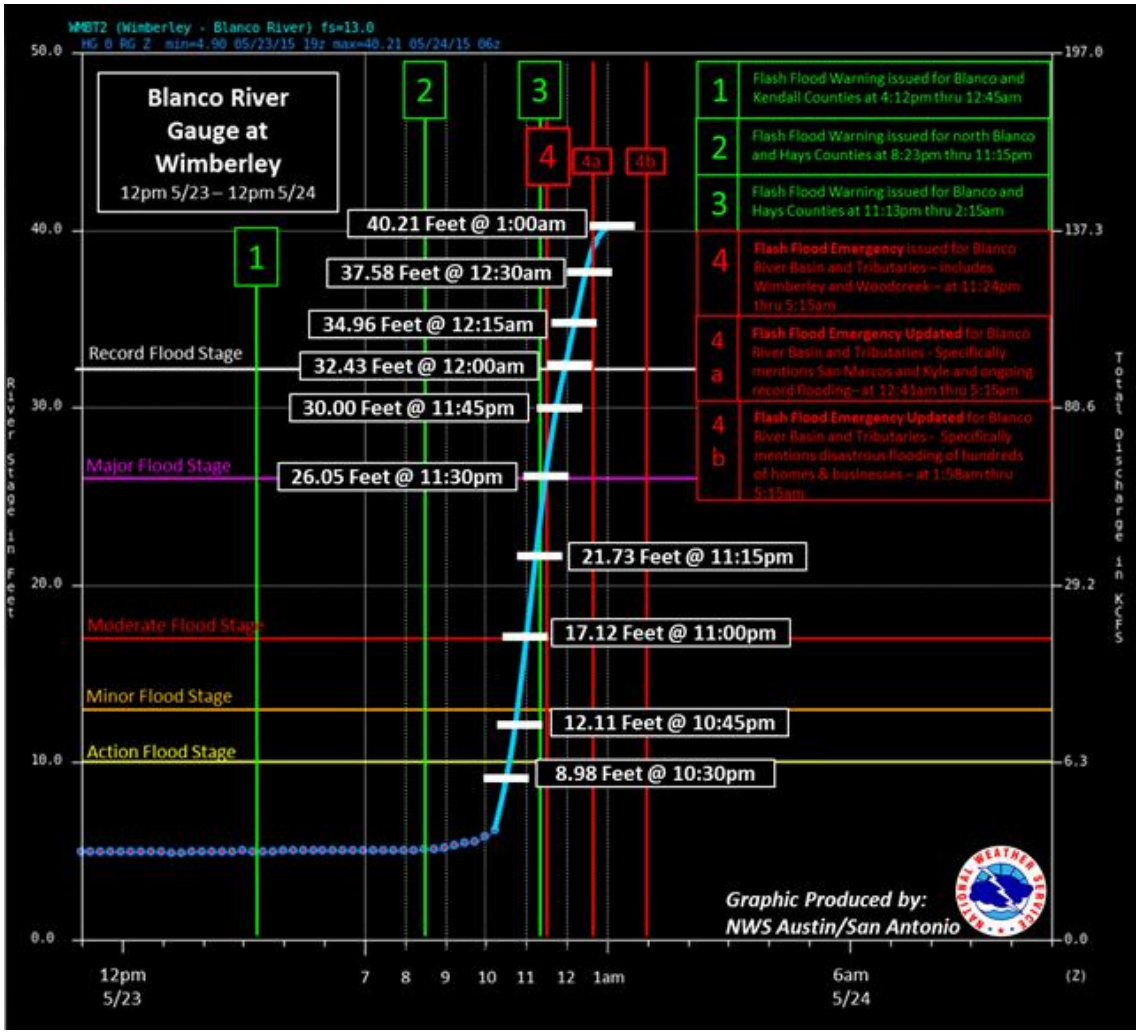
[5] Christopher Ingraham, "Visualized: How the insane amount of rain in Texas could turn Rhode Island into a lake," *Washington Post*, May 27, 2015, https://www.washingtonpost.com/news/wonk/wp/2015/05/27/the-insane-amount-of-rain-thats-fallen-in-texas-visualized/?noredirect=on

[6] "U.S. Storms, Floods Kill 31 People, 27 of Them in Texas," *Wall Street Journal*, May 30, 2015, https://www.wsj.com/articles/u-s-storms-floods-kill-29-people-25-of-them-in-texas-1433006237

Central and Eastern Texas were also hit by dangerous flooding in October of 2015 when rainfall patterns converged with remnants of Hurricane Patricia. In total, 22 counties were part of this disaster declaration (DR-4245).

For both disasters, there was a total of 16,253 approved applications for FEMA Individual Assistance. Total approved individual and households program assistance was $76,048,194. The total Public Assistance obligated was $209,596,310 for both disasters, with emergency work totaling $39,933,822 and permanent work totaling $157,709,665. Widespread flooding in 2015 could cost Texas upward of $3 billion, largely from damage to soaked roads and public infrastructure.[7]

Figure 2-3: Hydrography for Blanco River at Wimberley.



[7] Dylan Baddour,"Texas flood damage could top $3 billion for 2015," *Houston Chronicle*, October 28, 2015, https://www.chron.com/news/houston-texas/texas/article/texas-flood-damage-cost-climate-change-el-ni-o-6594008.php

2.1.2 THE 2016 FLOODS

The 2016 Floods resulted from storms that extended from March through June, causing severe damage across almost half the state or 134,000 square miles.

The torrential rain event in March was a devastating blow to many Texas communities still trying to recover from the impact of the 2015 Floods. The continuous heavy rainfall on nearly saturated ground created excessive downstream flooding and record-breaking river crests. The record-setting devastation destroyed agricultural areas and homes and resulted in the closure of Interstate 10 along the Texas-Louisiana border that created lengthy delays for individuals, as well as major disruptions in the delivery of goods and services.[8]

On March 19, 2016, Texas received a Presidential disaster declaration (DR-4266) allowing for access to federal disaster assistance including debris removal and emergency protective measures.[9] The extensive flooding effectively cut off access to entire communities. Thousands of Texans were forced to evacuate their homes and entire cities required mandatory evacuations. In Orange County, approximately 9,000 community members were evacuated while in Newton County, approximately 3,500 community members were evacuated, resulting in long-term sheltering needs for community members trying to recover and rebuild from the devastation. In Deweyville, the elementary school was flooded with over 5 feet of water that resulted in an estimated $12 million in damages; consequently, over 600 Deweyville students were out of school for a month while the community was without an elementary school.[10]

The Texas Division of Emergency Management's Disaster Summary Outline (DSO) estimated that the state's infrastructure was hard hit, with heavy damage to roads and multiple destroyed bridges. The swift flood waters carrying debris left many roads impassable, forcing many closures. Due to rain occurring upstream, downstream river levels continued to rise even after the rain stopped, causing even more damage and limiting community members' ability to return to or have access to their homes. The Burr's Ferry Bridge damage alone was so severe as to require a full closure, with subsequent extensive repairs to the bridge's piers.

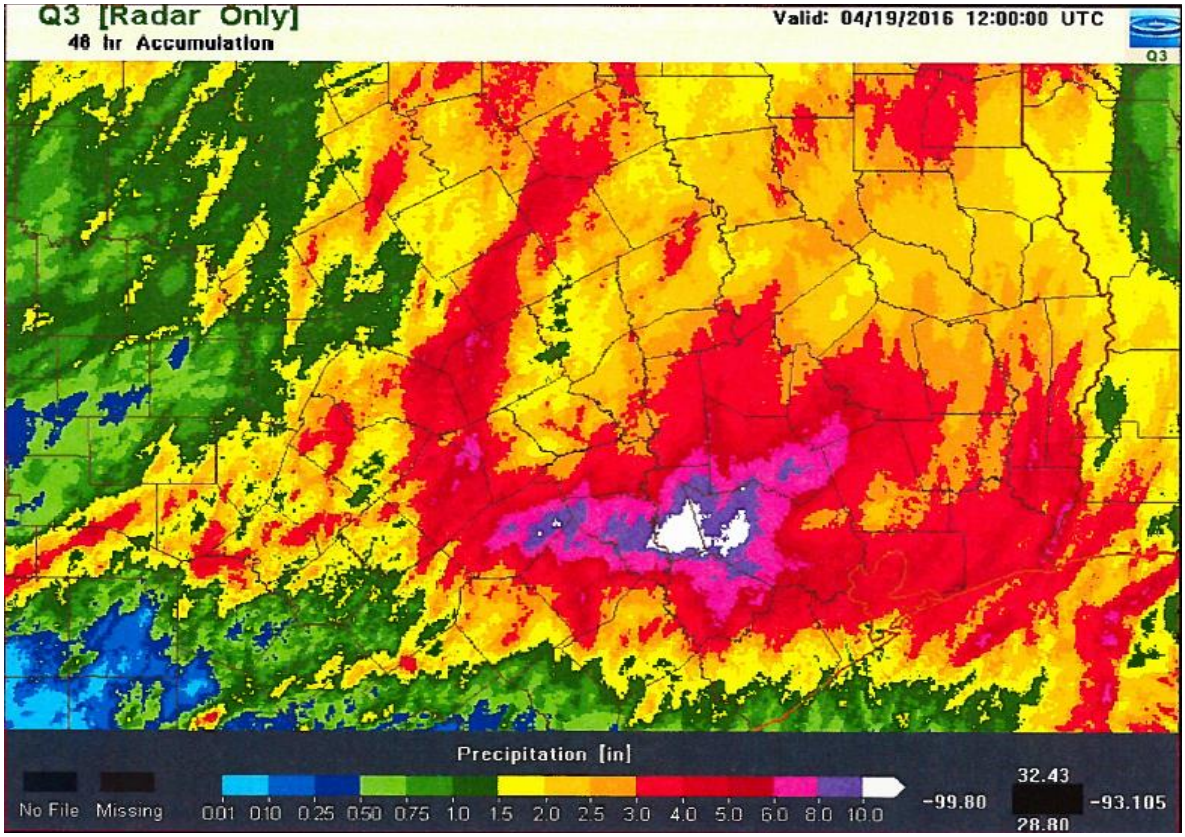
[8] "Disaster Management Assessment DR-4266 Texas April 2016 FINAL," FEMA—Department of Homeland Security.
[9] "Texas—Severe Storms, Tornadoes, and Flooding, FEMA-4266-DR, Declared March 19, 2016," FEMA, https://www.fema.gov/media-library-data/1460556248725-fc01158557a973f761ab1f1a284c421e/FEMA4266DRTX(Expedited).pdf
[10] Ibid.

Figure 2-4: Burr's Ferry Bridge SH 63 over the Sabine River.[11]

On April 17, 2016, Texas was hit with a sixth catastrophic rain event in a 12-month period, initiating a rare flash flood "emergency warning" by the National Weather Service's Houston/Galveston Weather Forecast Office. The rare warning criteria was on target, given the consequences to a highly vulnerable population. The severe flooding greatly affected first responders' abilities to assist community members and, in some instances, even required the rescue of first responders themselves. Parts of Southeast Texas received 10 inches or more of rain during a 24-hour period, with parts of northwest Harris County and Houston receiving up to 15 inches.[12] The devastating floods covered seven counties. On April 25, 2016, Texas received a second Presidential disaster declaration (DR-4269) for the April flooding.

[11] Photography by Texas Department of Transportation.
[12] John D. Harden, "Breaking down Houston's recent flooding events," *Houston Chronicle*, April 27, 2016, https://www.houstonchronicle.com/local/article/How-floods-compare-7330750.php

Figure 2-5: 48-hour rainfall estimates for Southeast Texas April 18-19, 2016.[13]



Texas was hit by another intense round of devastating storms in May, a year after the historical 2015 Memorial Day flooding event. The storms occurred between May 26 and mid-June, marking the third catastrophic storm event to impact Texas in 2016. This series of storms resulted in disaster declaration DR-4272. The effect of these storms continued to devastate communities as rain fell on supersaturated ground in counties still recovering from the previous months' floods and the flooding in 2015. Evacuation and search data provide an insight into the acute severity of these storms. Jointly, Texas Task Force 1 and the Texas Military Department made over 1,444 evacuations, 40 rescues, 520 assists, 618 wellness checks, and many victim recoveries. Texas Parks and Wildlife Department recorded 336 evacuations and 78 rescue assists.[14] Mandatory evacuations were required in many counties, including Bastrop, Brazoria, Fort Bend, Hood, and Parker, along with voluntary evacuations throughout the disaster area.

[13] Radar image courtesy National Weather Service, Houston/Galveston, April 19, 2016.
[14] "Disaster Case Management Assessment Texas DR-4272 Severe Storms and Flooding August 15, 2016," FEMA—Department of Homeland Security.

On May 26 and 27, the Austin area received widespread rain of 6–8 inches, and in a corridor stretching from I-35 in Austin to just east of I-45, over 12 inches of rain was recorded. The evening of May 28 provided more hardships, as the Texas Hill Country received widespread heavy rains of 6–10 inches—leading to flash flooding and critical flood stages for many rivers, including the Frio, Medina, and Guadalupe. Emergency response to the rain event included evacuations at Jellystone Park and along the Frio River.[15] Rescue efforts continued as a large thunderstorm moved into the Texas Hill Country the evening of May 28; subsequently, record-breaking rainfall totals were noted, as well as rare cresting above flood stage levels of rivers and creeks.

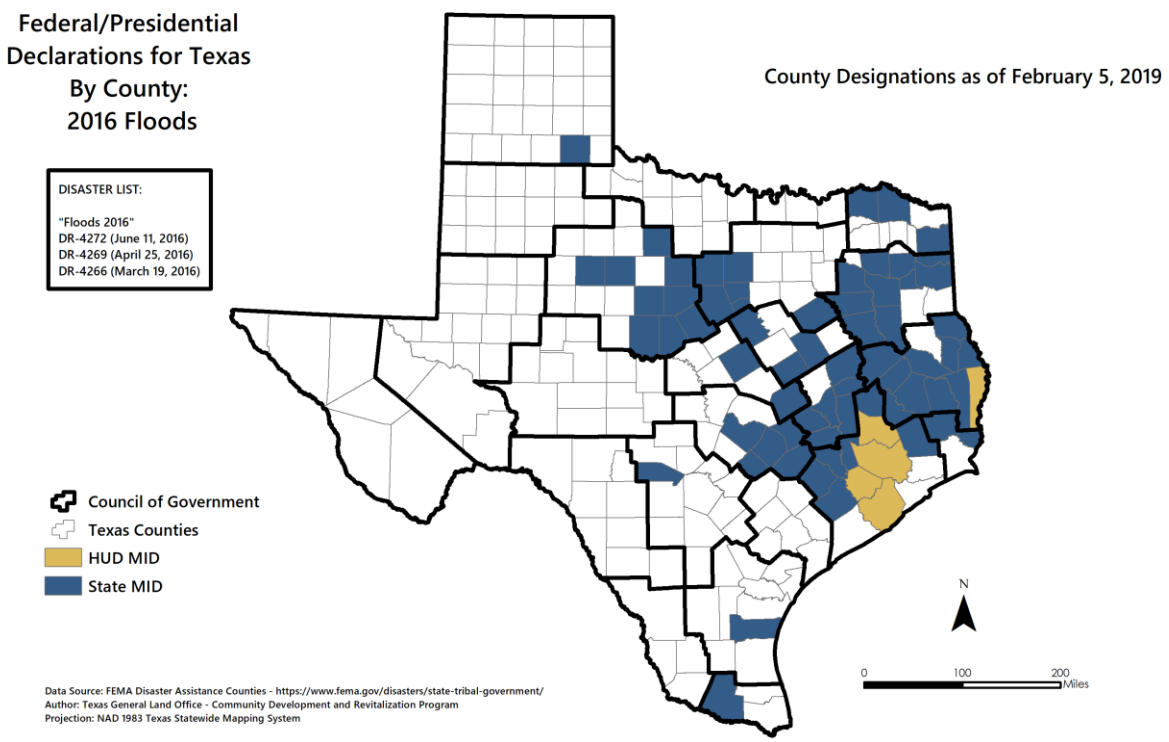
The Memorial Day holiday again proved to be devastating. As heavy rains fell, renewed flash flooding necessitated water rescues during overnight hours. In Hood County, 10 inches of rain flooded and shut down many county roads. On the morning of June 2, this dangerous episode of flash flooding claimed the lives of nine soldiers in Fort Hood, as their Light Medium Tactical Vehicle was washed from a low-water crossing and overturned in swollen Owl Creek.[16]

South Texas was also severely impacted by the storms, as two confirmed EF-1 tornadoes wreaked havoc to homes and infrastructure within those communities. The Houston area alone was hit with as much as 8 inches of rain in 5 hours.

In Fort Bend County, the devastation to critical infrastructure included damage to bridges, roads, and levees due to the continuous flooding along the Brazos River, compounding effects from the 2015 declared disasters. It is estimated that 181 homes were destroyed in the county, with an additional 600 homes experiencing major damage.

[15] "Disaster Case Management Assessment Texas DR-4272 Severe Storms and Flooding August 15, 2016," FEMA—Department of Homeland Security.
[16] Michelle Tan, "Army releases names of all 9 soldiers killed in Fort Hood truck accident," *Army Times*, June 5, 2016, https://www.armytimes.com/news/your-army/2016/06/05/army-releases-names-of-all-9-soldiers-killed-in-fort-hood-truck-accident/

Figure 2-6: 2016 Floods County Declarations



2.1.3 HURRICANE HARVEY

In 2017, communities still working to recover from the severe 2015 and 2016 flooding events were impacted again. Hurricane Harvey, a regenerated tropical depression, made landfall on August 25, 2017, as a Category 4 hurricane, bringing with it extreme wind gusts and, in some places, up to 60 inches of rain in 5 days.[17] The hurricane caused catastrophic flooding and at least 82 human fatalities,[18] due in part to the weather system stalling over the Texas coast. The windspeeds recorded over South Texas may have been underestimated, especially near the coast and close to the eye of the hurricane, as many observation stations were disabled prior to its landfall; however,

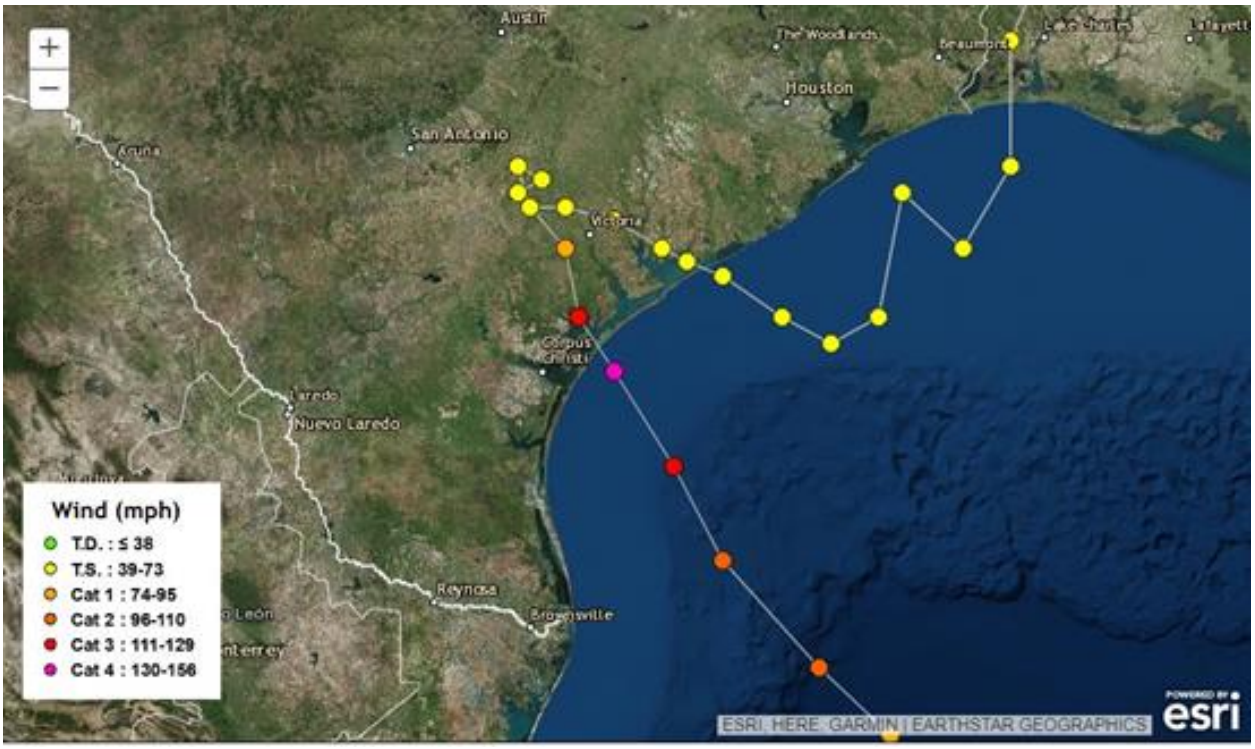
[17] "Hurricane Harvey in Texas, Building Performance Observations, Recommendations, and Technical Guidance," Mitigation Assessment Team Report, (FEMA P-2022/February 2019) FEMA, https://www.fema.gov/media-library-data/1551991528553-9bb91b4bfe36f3129836fedaf263ef64/995941_FEMA_P-2022_FINAL_508c.pdf

[18] Eva Ruth Moravec, "Texas officials: Hurricane Harvey death toll at 82, 'mass casualties have absolutely not happened.'" *Washington Post*, September 14, 2017, https://www.washingtonpost.com/national/texas-officials-hurricane-harvey-death-toll-at-82-mass-casualties-have-absolutely-not-happened/2017/09/14/bff3ffea-9975-11e7-87fc-c3f7ee4035c9_story.html?utm_term=.dfe744e2fbe8

a peak wind gust of 152 mph (at 10 meters above ground level) was recorded at the Aransas County Airport in Rockport.[19]

Although Hurricane Harvey made landfall twice in Texas, it is often regarded as three separate events: the initial landfall in Aransas County; unprecedented rainfall in the Houston metroplex and surrounding areas; and the second landfall on August 29, 2017, in Southeast Texas near the cities of Orange, Beaumont, and Port Arthur. These events caused not only wind damage but devasting widespread flooding.

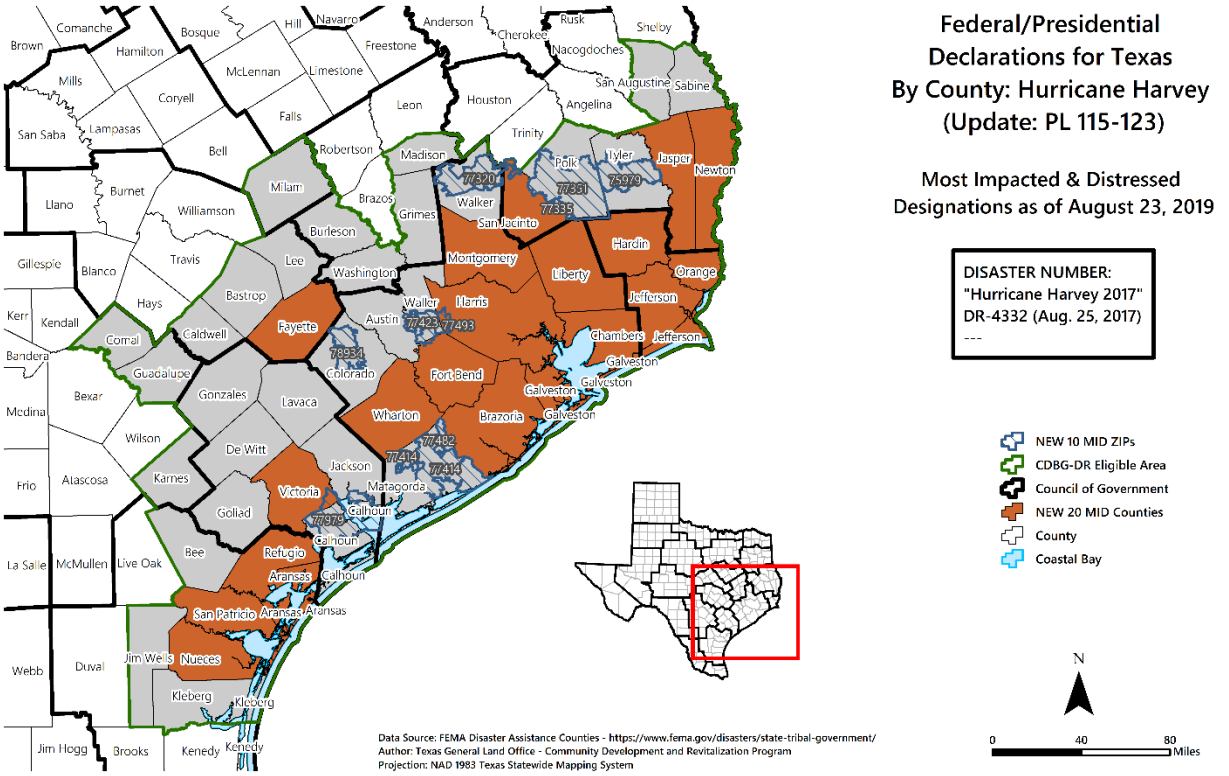
Figure 2-7: Track of Hurricane Harvey.[20]



[19] "Major Hurricane Harvey—August 25-29, 2017," Corpus Christi, TX Weather Forecast Office, National Weather Service, NOAA, http://www.weather.gov/crp/hurricane_harvey

[20] Ibid

Figure 2-8: Hurricane Harvey Eligible Counties (UPDATE PL 115-123)



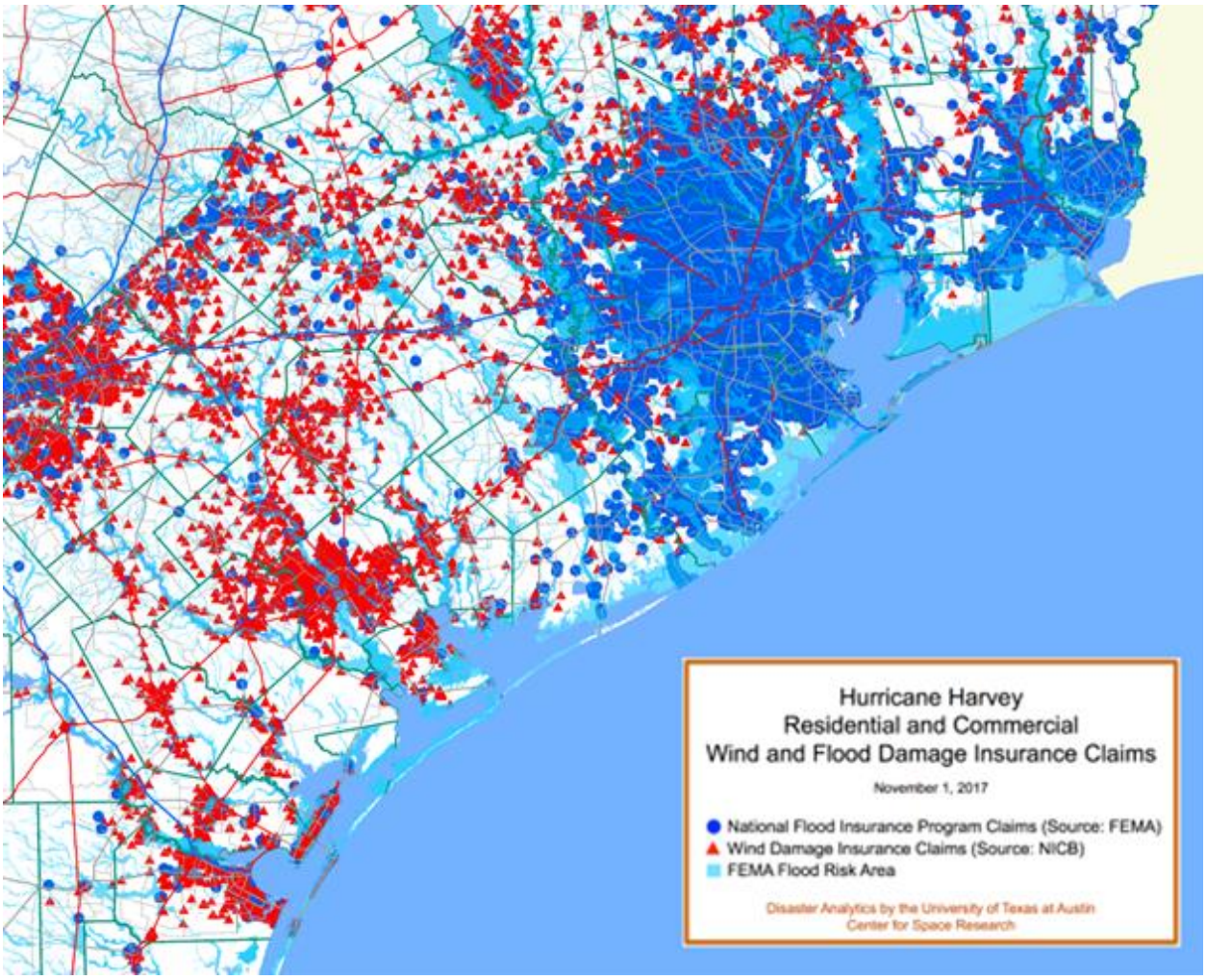
Quick Facts:

- At landfall, Hurricane Harvey was approximately 250 miles in diameter, with an eye 20 miles in diameter.
- Over 560,000 people evacuated in advance of the hurricane.
- Largest rainfall event in U.S. history.
- In Aransas, Nueces, Refugio, and San Patricio Counties, wind forces damaged 40,929 buildings, resulting in $4.58 billion in damage.
- As the hurricane stalled over the Houston metroplex, approximately one-third of Harris County was completely underwater.

The 49 CDBG-DR eligible counties affected by Hurricane Harvey cover 15 percent or 39,496 square miles of the land area in the state and contain approximately 32 percent of the state's population. The land area affected is roughly the size of the state of Kentucky.[21] Nearly 9 million Texans live in the affected counties.

The initial landfall caused severe wind damage (demonstrated by the number of windstorm damage insurance claims in red, Figure 3-9). This map also portrays the extent of NFIP claims in the northern section of the coast, where storm rains caused severe flooding in Houston and the surrounding areas. This graphic further demonstrates the two catastrophic characteristics of Hurricane Harvey: (1) hurricane-force winds and (2) a slow-moving storm bringing historic rainfall and flooding.

Figure 2-9: Residential and Commercial Windstorm and Flood Damage Insurance Claims



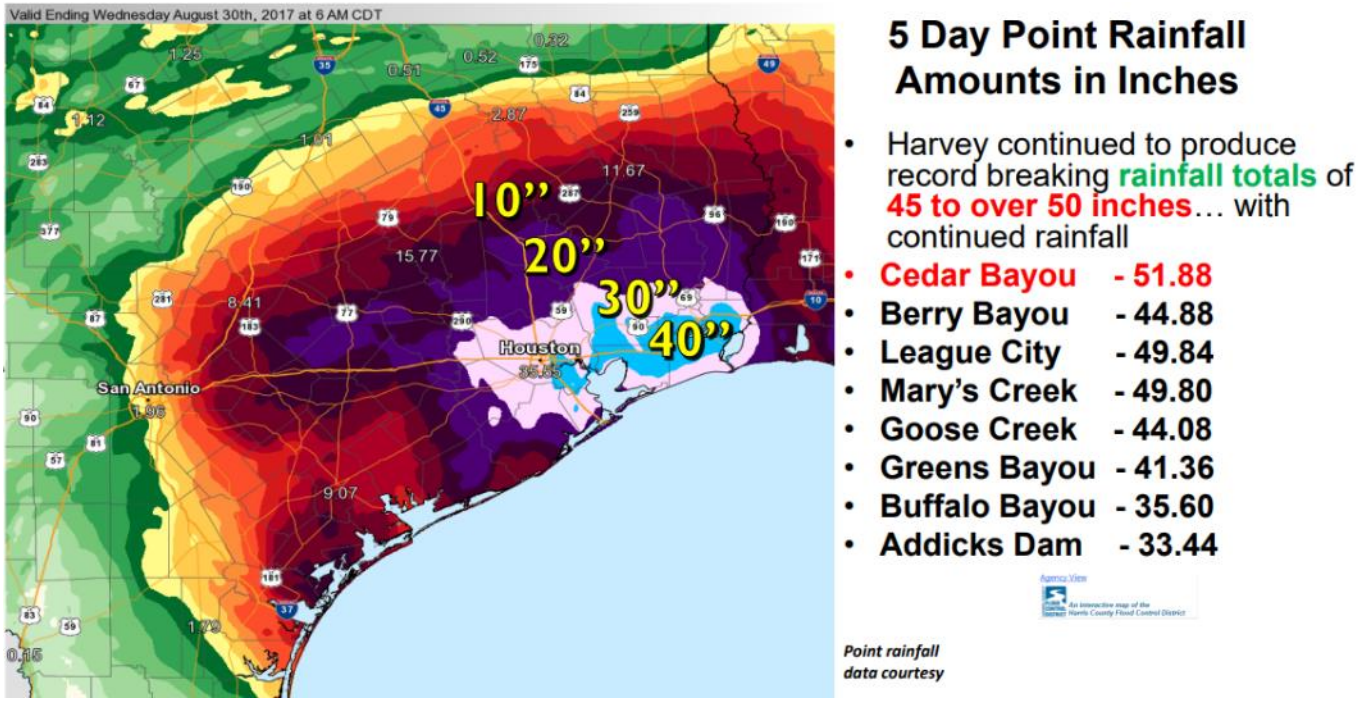
[21] "QuickFacts, Kentucky; United States," United States Census Bureau, accessed September 27, 2019, https://www.census.gov/quickfacts/fact/table/KY,US/LND110210

Figure 2-10: Texas Army National Guard and Texas Task Force One, Port Arthur.[22]

By the time the rain stopped, Hurricane Harvey had dumped almost a year's worth of rainfall in a matter of days. So much rain fell during the hurricane that the National Weather Service had to update the color charts on their graphics in order to effectively map it (see figure below). Two additional shades of purple were added to represent rainfall totals for 20–30 inches and "greater than 40 inches" ranges.

[22] Photograph by Sgt. Steve Johnson, September 1, 2017, https://www.dvidshub.net/image/3742405/members-texas-army-national-guard-conduct-air-missions-support-operations-hurricane-harvey

Figure 2-11: National Weather Service's 5-Day Point Rainfall in Inches.[23]



According to the Texas Legislative Budget Board April 2019 report, more than 70 state agencies responding to Hurricane Harvey have been fiscally impacted in aggregate over $3.3 billion. This number does not account for potential significant state public school finance expenses primarily driven by facility damage costs and property value declines. Certain disaster-related costs are statutorily required through the Foundation School Program (FSP), which is the principal vehicle for distributing state aid to school districts to provide educational services. The statutorily required state cost for the 2020–21 biennium totals $715.1 million alone in increased state aid due to decreased property values during tax year 2018. The total fiscal impact to the state (i.e., actual and estimated) could reach $6.3 billion, not including education costs.[24]

[23] "Hurricane Harvey & Its Impacts on Southeast Texas (August 25-29, 2017)," Houston/Galveston, TX Weather Forecast Office, National Weather Service, NOAA, https://www.weather.gov/hgx/hurricaneharvey

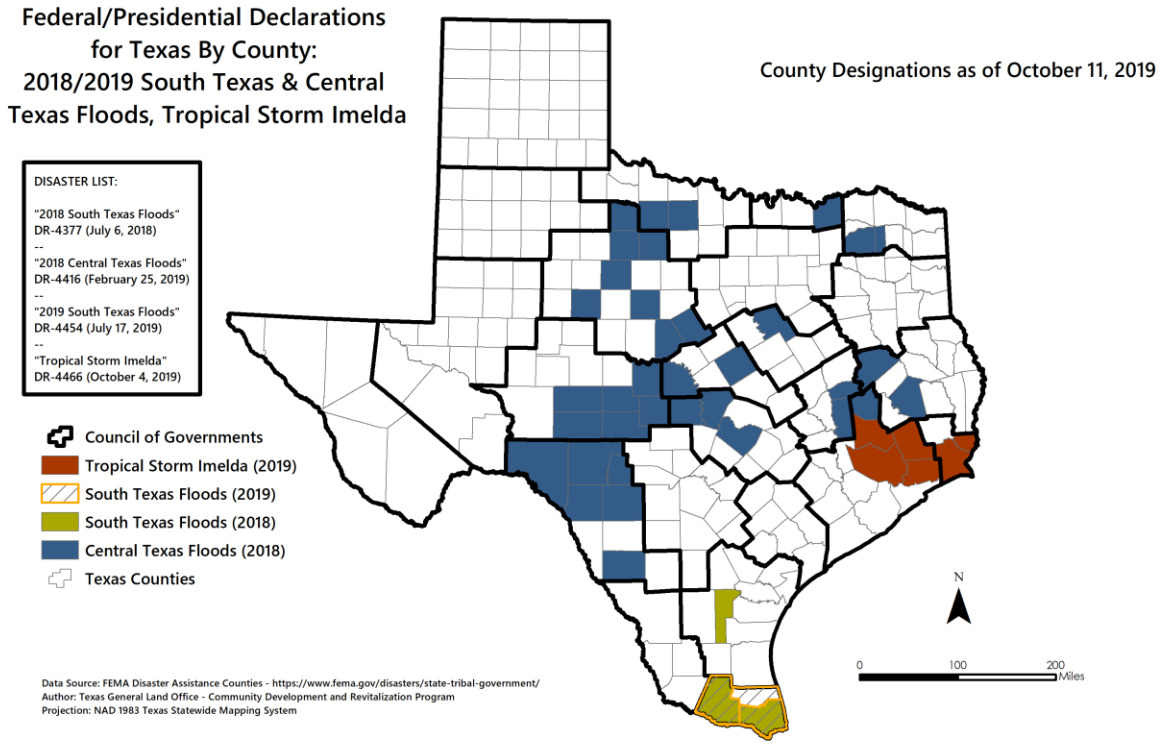
[24] "Fiscal Impact of Hurricane Harvey on State Agencies," Legislative Budget Board Staff Reports, April 2019, http://www.lbb.state.tx.us/documents/publications/staff_report/2019/5097_hurricane_harvey.pdf

2.1.4 2018 & 2019 Floods and Tropical Storm

While the CDBG-MIT funds are designated for mitigation needs in the most impacted and distressed communities across the state for the 2015, 2016, and 2017 (Hurricane Harvey) disaster events, additional federal declarations have been made for Texas since 2017. In 2018, there were two federal disaster declarations: severe storms and flooding (DR-4377), which impacted three counties in South Texas; and severe storms and flooding (DR-4416), which was a Public Assistance declaration for a variety of counties in the Hill Country in Central Texas, as well as other counties in Texas.

In 2019, the Lower Rio Grande Valley in South Texas was once again hit with severe weather, resulting in another federal disaster declaration (DR-4454). Tropical Storm Imelda in the late summer of 2019 impacted a large swath of Southeast Texas and left affected community members without homes and infrastructure-- resulting in a federal disaster declaration (DR-4466). This is continued evidence for the need for mitigation measures against floods, hurricanes, tropical storms, and depressions, and other hazards that this Action Plan addresses.

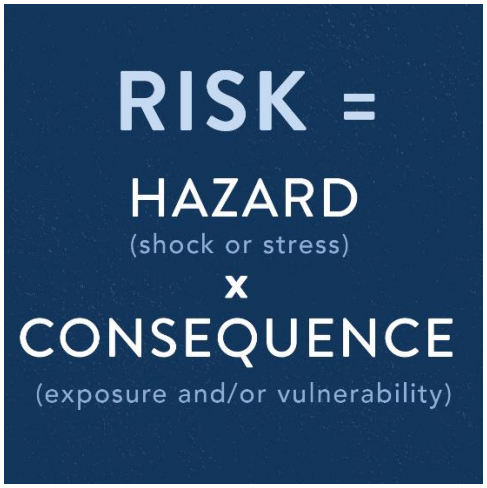
Figure 2-12: 2018 & 2019 Disaster Declared Counties



2.2 CDBG Mitigation

Populations across Texas experience continued risk from a wide variety of hazards. Risk is defined as an individual or community's exposure to danger and can be defined by the formulation of risk equaling the probability of a disruptive event, shock or stress, e.g., a hazard, multiplied by the consequences (exposure and vulnerability) or loss connected to the event occurrence.[25] This conceptual definition of risk can be written out as: Risk = Hazard x Consequence.

Figure 2-13: Risk



Over the past several years, government institutions, private and nonprofit sectors, and academia have evaluated the increased exposure to risk that populations face and are working to identify ways to mitigate against these risks. Traditionally, following a disaster and the immediate response and short-term recovery efforts, congressional appropriations are made to the U.S. Department of Housing and Urban Development (HUD) through the Community Development Block Grant program for long-term disaster recovery (CDBG-DR). These CDBG-DR funds are a mechanism for states and local communities to address their unmet recovery needs arising from events receiving a Presidential disaster declaration. These funds are typically used for infrastructure, housing recovery, and economic development and revitalization.

In response to the threat posed by future hazards and the difficulty that states and communities face in rebuilding following a major disaster, a congressional appropriation specifically targeted towards hazard mitigation was made in 2018. This appropriation was laid out in Public Law (Pub. L.) 115-123 and provided $28 billion in funding to 2015, 2016, and 2017 CDBG-DR grantees. Congress specified that these funds be used for two purposes: (1) to address unmet needs from

[25] "Preliminary Outcome Evaluation: The National Disaster Resilience Competition's Resilience Academies," *Urban Institute, The Rockefeller Foundation*, December 2016, https://assets.rockefellerfoundation.org/app/uploads/20170302163105/NDRC-Resilience-Academies-Evaluation-Report-2016.pdf

qualifying 2017 disasters; and (2) to provide funding to grantees from 2015 through 2017 for mitigation activities. When these funds were appropriated, HUD's CDBG program was identified as the mechanism through which these funds would be allocated to the impacted states and territories. HUD then made grantee allocation determinations and developed the subsequent Federal Register notice, 84 FR 45838 (August 30, 2019), outlining the rules and regulations for this first-ever CDBG mitigation (CDBG-MIT) funding stream.

To understand the shift in focus from HUD's CDBG-DR program to this new CDBG-MIT program, it is important to define mitigation as it pertains to natural hazards. The Federal Emergency Management Agency (FEMA) defines mitigation as an effort to reduce loss of life and property by lessening the impact of disasters. Similarly, HUD defines mitigation as:

> *Those activities that increase resilience to disasters and reduce or eliminate the long-term risk of loss of life, injury, damage to and loss of property, and suffering and hardship, by lessening the impact of future disasters.* —84 FR 45838 (August 30, 2019)

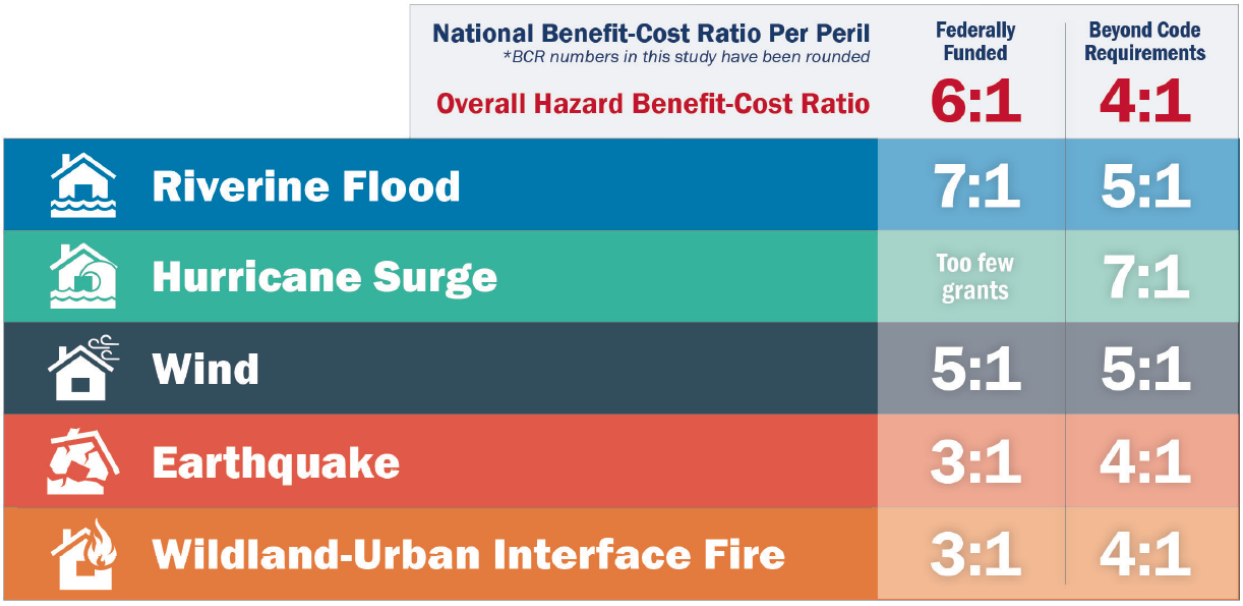
Figure 2-14: The Aspects of Mitigation

For mitigation to be effective, communities and states must take action before future hazards strike. This is particularly true in a state like Texas that experiences such a wide range of natural hazards. By understanding local risks, communities can identify and invest in long-term interventions that ensure community well-being and safety.

Without these mitigation interventions, safety, financial security, and self-reliance are jeopardized. Effective mitigation efforts can break the cycle of disaster damage by removing people and

property from harm's way and building systems that redirect or lessen the impact of natural hazards, not only saving lives but reducing future expenditures related to recovery. For example, a recently updated study by the National Institute of Building Sciences shows that federally funded mitigation grants, on average, can save a community and nation $6 in future disaster costs for every $1 spent on hazard mitigation. Additionally, the report also illustrates that, on average, investments made by local communities and homeowners in hazard mitigation measures that exceed standard building codes can save $4 for every $1 spent.[26] (See the figure below.)

Figure 2-15: Benefit-Cost Ratio of Mitigation



Hazard mitigation is an important investment. Accordingly, the CDBG-MIT program will serve as a large-scale demonstration of the impact and effectiveness of a national hazard mitigation program whose approach is highly adaptable and flexible to help states and local communities begin, or continue, efforts to mitigate against a variety of hazards. The $4.29 billion directly allocated to the state of Texas as a HUD grantee will prove to be a long-lasting investment that increases the resiliency of communities throughout the state.

The Mitigation Needs Assessment and use of funds outlined in this Action Plan may align and leverage additional state and federal programs such as the National Flood Insurance Program (NFIP), the Hazard Mitigation Grant Program (HMGP), the Pre-Disaster Mitigation (PDM) Program (which will be transforming into the Building Resilient Infrastructure and Communities [BRIC] in 2020), as well as other state and local mitigation efforts.

[26] *Natural Hazard Mitigation Saves: 2018 Interim Report*, National Institute of Building Sciences, January 2018, https://www.nibs.org/page/mitigationsaves

2.3 Resiliency Solutions and Mitigation Priorities

Recognizing the state's long and well-documented history of flooding, hurricanes, wildfires, and droughts brought recently into sharp focus by the flooding disasters of 2015 and 2016, together with the devastation of Hurricane Harvey, the CDBG-MIT funds will prove invaluable in helping to cover the additional costs of safeguarding housing and community infrastructure investments. Mitigation approaches can greatly reduce the cost of future damages by a ratio of 6:1. The success of this long-term recovery practice was seen firsthand during Hurricane Harvey when CDBG-DR resiliency-enhanced projects withstood Hurricane Harvey's worst effects.

Single family home resiliency solutions are expected to add approximately 10 to 15 percent to the total cost per home; multifamily resiliency solutions add 15 to 20 percent to the total cost per project; and infrastructure resiliency solutions add 15 to 20 percent to the total cost per project. Resiliency solutions are varied and dependent on the respective area's Threat and Hazard Identification and Risk Assessment.

Single family home resiliency solutions may include elevating the first floor of habitable area; breakaway ground floor walls; reinforced roofs; storm shutters; use of ENERGY STAR appliances and fixtures; and mold and mildew resistant products. Multifamily resiliency solutions include elevation; retention basins; fire-safe landscaping; firewalls; and landscaped floodwalls.

Buyout programs support hazard mitigation, floodplain management goals, and resiliency by removing homeowners from the floodplain, thus eliminating vulnerability to future flooding situations. After homes are purchased, the structures are demolished or relocated. The land reverts to a natural floodplain, converts into a retention area, is retained as green space for recreational purposes, or becomes a component of ecosystem restoration or wetlands management practices. The buyout option serves multiple objectives and provides a resiliency option versus rebuilding within a floodplain, helping to prevent repetitive loss and extreme risk to human health and safety. Additionally, buyouts conducted in a timely manner prevent homeowners from making repairs and investing funds in properties that they then may not want to sell.

In the case of infrastructure resiliency solutions, improvements may include:

i. Elevating critical systems, facilities, and roadways above base flood elevation;

ii. Installing backup power generators for critical systems (water, sewer, etc.);

iii. Avoiding an increase in impervious cover by keeping projects in their original footprint and encouraging the use of building practices that allow for more pervious coverage;

iv. Incorporation of natural or green infrastructure strategies, such as wetland or land barriers, or mimicking such systems, e.g., using permeable pavements and amended soils to improve infiltration and pollutant removal;

v. Replanting with only native vegetation to preserve the natural environment;

vi. Stormwater management including installing retention basins, larger culverts and debris guards, and erosion control solutions;

vii. Backup communication systems; and

viii. Supporting local community efforts to (1) enhance building codes and Land Use Plans, (2) participate in multi-jurisdiction hazard mitigation plans to qualify for HMGP funds, and (3) participation in the NFIP.

2.4 Demographic Profile of Impacted Counties

The demographic profile data was generated using a wide range of data sets from the U.S. Census Bureau's American Community Survey from 2017, unless otherwise noted.

Quick Facts:

- The 140 CDBG-MIT eligible counties impacted by the 2015 Floods, 2016 Floods, and Hurricane Harvey cover 48.5 percent, or 130,279 square miles of the state.
- These counties contain approximately 77.4 percent of the state's population, accounting for just over 21 million Texans.
- Since 2010, these counties have seen a 9 percent population increase totaling 1.8 million people.

Of the approximately 8.3 million housing units located in eligible counties, 54.8 percent are owner-occupied units, close to the statewide rate of 55.1 percent. The estimated median owner-occupied housing unit value and median household income are both lower in the eligible counties than the state as a whole. Median value of owner-occupied housing units in the eligible counties is $116,388—roughly $35,000 less than the statewide median value of $151,500. Median household income in the eligible counties is $50,014—approximately $7,000 less than the statewide average of $57,051. The poverty rate is nearly identical—16 percent—between the state and eligible counties.

The demographic differences between the state and eligible areas are minimal. The largest divergence is within the Hispanic or Latino population, which is currently at 38.9 percent for the state and 35.8 for the eligible area. Slight differences also exist among the percentage of African-Americans—12 percent for the state, 13.5 percent for the eligible area—and White, Non-Hispanic or Latino, where the state rate is 42.9 percent and the eligible area is 44.3 percent. The minority

population as a whole in all 140 eligible counties is approximately 55.7 percent—less than two percentage points lower than the statewide rate.

In the 140 eligible counties, the elderly account for 11.6 percent, while disabled persons under the age of 65 account for 6.7 percent of the population. These numbers are in line with state averages. The table below contains the full demographic profile for the state and eligible areas.

Table 2-1: Demographic Statistics for Texas and the 140 CDBG-MIT Eligible Counties, 2017 American Communities Survey

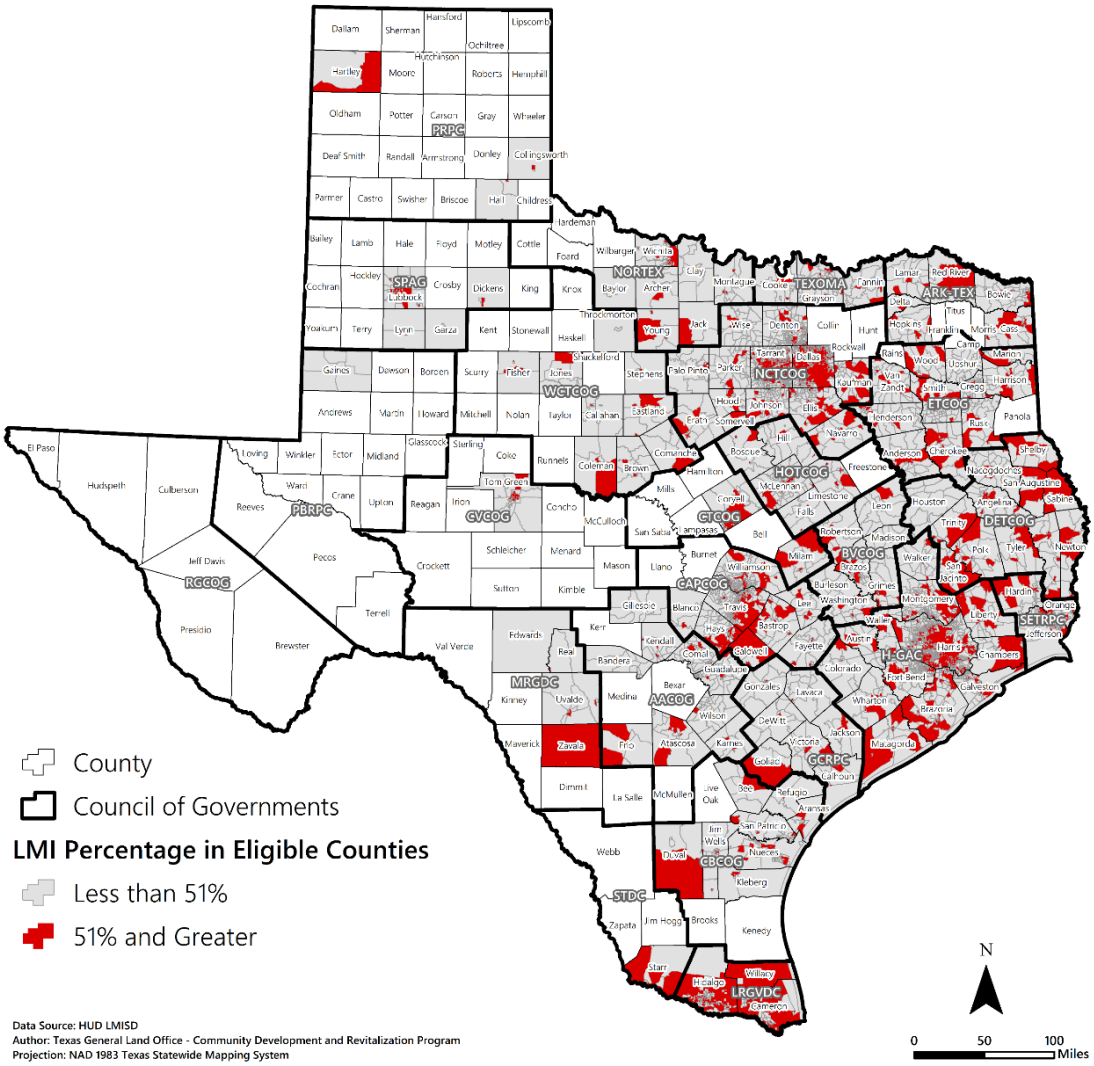
	Texas	140 CDBG-MIT Eligible Counties	
Fact	Estimates	Estimates	Percent of Area
Population estimates	27,419,612	21,216,942	77.4% of Texas Population
Population, percent change – 2010–2017	12.78%	9%	
Persons under 5 years, percent	7.23%	1,540,166	7.3% of Eligible Population
Persons under 18 years, percent	26.31%	2,349,074	11.1% of Eligible Population
Persons 65 years and over, percent	11.73%	2,470,171	11.6% of Eligible Population
White alone, percent	74.62%	15,501,777	73.1%
Black or African American alone, percent	11.99%	2,856,236	13.5%
American Indian and Alaska Native alone, percent	0.48%	92,874	0.4%
Asian alone, percent	4.51%	1,014,014	4.8%
Native Hawaiian and other Pacific Islander alone, percent	0.09%	15,762	0.1%
Two or more races, percent	2.56%	528,328	2.5%
Hispanic or Latino, percent	38.93%	7,590,578	35.8%
White alone, not Hispanic or Latino, percent	42.87%	9,395,007	44.3%
Housing units	10,932,870	8,263,936	
Owner-occupied housing unit rate	55.14%	4,529,994	54.8% of Housing Units

	Texas	140 CDBG-MIT Eligible Counties	
Fact	Estimates	Estimates	Percent of Area
Median value of owner-occupied housing units	$151,500	$116,388	
Median gross rent	$952	$765	
With a disability, under age 65 years, percent	6.96%	1,426,209	6.7% of Eligible Population
Median household income (in 2017 dollars)	$57,051	$50,014	
Persons in poverty, percent	16.00%	16.08%	
Land area in square miles	268,596	130,279	48.5% of Texas

2.5 Low- and Moderate-Income Analysis

Of the 11,861 block groups within the 140 eligible counties, 5,072—representing approximately 43 percent—qualify as low and moderate income (LMI). The percentage of LMI individuals throughout the eligible counties is similar, at roughly 45 percent. The figure below identifies census block groups that have an LMI population of 51 percent or more for the 140 eligible counties using HUD's 2019 LMI Summary Data (LMISD) for the state of Texas.[27]

Figure 2-16: Percentage of LMI Population by Block Group



[27] "FY 2019 LMISD by State—All Block Groups, based on 2011-2015 American Community Survey," HUD Exchange, accessed September 27, 2019, https://www.hudexchange.info/programs/acs-low-mod-summary-data/acs-low-mod-summary-data-block-groups-places/

2.6 State Risks and Hazards Assessment

The following sections identify and analyze all significant current and future disaster risks and impacts in the State of Texas Hazard Mitigation Plan (SHMP) and provide a substantive basis for the activities described in the Action Plan. The SHMP is a FEMA-approved plan authored and maintained by the Texas Division of Emergency Management (TDEM); it is the starting point for this State Risks and Hazards Assessment (the RHA) to identify Texas' hazards. In addition to utilizing the SHMP, a variety of other data sources identified the hazards, risks, and impacts discussed throughout this RHA.

This RHA quantitatively evaluates the potential significant impacts and risks of the identified hazards that affect the following seven critical service areas (also known as FEMA's Community Lifelines):

- Safety and Security
- Communications
- Food, Water, Sheltering
- Transportation
- Health and Medical
- Hazardous Material (Management)
- Energy (Power & Fuel)

The proposed programs in the Action Plan work to ensure that these critical lifeline areas are made more resilient and are able to (1) reliably function during and after future disasters; (2) reduce the risk of loss of life, injury, and property damage; and (3) accelerate recovery following a disaster. Forecasted information gleaned from the SHMP is also presented for each hazard and pertains to potential property loss (in dollars), potential crop loss (in dollars), potential fatalities, and potential injuries.

This RHA articulates the top two hazards impacting Texas:

- Severe coastal and riverine flooding
- Hurricanes, tropical storms, and depressions

2.6.1 State of Texas Hazard Mitigation Plan 2018

FEMA requires states, tribes, and local governments to adopt and update their hazard mitigation plans every 5 years as a condition for receiving certain types of federal funding—including mitigation funding. The current SHMP, authored and regularly updated by TDEM, is the latest iteration to meet this requirement. The SHMP details 18 natural hazards that impact Texas.

Table 2-2: Top Natural Hazards in Texas

Hazards in Texas
Severe Coastal Flooding
Hurricanes, Tropical Storms, and Depressions
Drought
Hailstorms
Riverine Flooding
Tornadoes
Wildfire
Severe Winds
Winter Weather
Lightning
Extreme Cold
Extreme Heat
Coastal Erosion
Inland Erosion
Land Subsidence
Earthquakes

The SHMP provides an overview of each hazard together with its respective impacts on the state over time. The SHMP then ranks Texas hazards by the severity of the potential impact on the state. The top three natural hazards Texas faces in terms of economic impact are (1) severe coastal flooding; (2) hurricanes, tropical storms, and depressions; and (3) drought.

This RHA addresses each of the 18 natural hazards and their associated risks referenced in the SHMP while citing additional sources to quantify each hazard's risks and impacts affecting FEMA's seven community lifelines.

2.6.2 FEMA COMMUNITY LIFELINES

FEMA cites a total of seven community lifelines that enable the continuous operation of government and critical business during a disaster: (1) Safety and Security, (2) Communications (3) Food, Water and Sheltering, (4) Transportation, (5) Health and Medical, (6) Hazardous Materials and (7) Energy. Together these lifelines provide a framework for communities to prioritize and review critical services during a disaster. According to FEMA, community lifelines are designed to highlight priority response areas, enhance community-wide situational awareness, and strengthen coordination efforts among responders during a disaster.

FEMA's community lifelines provide a framework for this RHA to discuss risks and impacts of Texas hazards. By describing lessons learned from past disasters in Texas through the frame of community lifelines, this RHA aims to ensure that CDBG-MIT funds go towards programs and activities that reduce the risk of loss of life, injury, and property damage, as well as accelerate recovery following a disaster.

Each lifeline is comprised of multiple components that can change based on a particular situation and hazard; these variable components reflect how each hazard uniquely affects the community. For instance, flooding and hurricanes strike quickly and need a variety of different types of first responders in a short amount of time, whereas a hazard like coastal erosion has the potential to occur over a long period of time and therefore the prioritization of first responders is not warranted.

Table 2-3: FEMA Community Lifelines and Components

I. Safety and Security	II. Communications	III. Food, Water, Sheltering	IV. Transportation	V. Health and Medical	VI. Hazardous Material	VII. Energy
Law Enforcement	Infrastructure	Evacuations	Highway/Roadway	Medical Care	Facilities	Power (Grid)
Search and Rescue	Alerts, Warnings, Messages	Food/Potable Water	Mass Transit	Patient Movement	Hazardous Debris, Pollutants, Contaminants	Temporary Power
Fire Services	911 and Dispatch	Shelter	Railway	Public Health		Fuel
Government Service	Responder Communications	Durable Goods	Aviation	Fatality Management		
Responder Safety	Financial Services/ Economic Impact	Water Infrastructure	Maritime	Health Care Supply Chain		
		Agriculture	Pipeline			

2.6.3 HURRICANES, TROPICAL STORMS, AND DEPRESSIONS

Hurricanes, tropical storms, and depressions that impact Texas form over warm tropical waters in the Gulf of Mexico or the Atlantic Ocean. The warm, moist air over the ocean rises upward from near the surface, creating an area of lower air pressure. These areas of relative low pressure draw in new air from surrounding high-pressure areas. Quick cyclonic circulation then begins, and rain bands spin out from a wall of wind that surrounds a central area of low barometric pressure (the "eye"). Such storms can grow to 1000 miles in diameter and sustain winds near the eye that approach 200 miles an hour.

Tropical depressions are storms with winds less than 39 mph. When the observed winds surpass 39 mph but remain below 74 mph, the formation is classified a tropical storm. Once winds in excess of 74 mph are observed, a hurricane has officially formed. The Saffir-Simpson scale, presented below, is used to describe the intensity of a hurricane, based on wind speed, and ranging from Category 1 to Category 5.

Table 2-4: Saffir-Simpson Wind Speed Scale

Saffir-Simpson Scale	
Category	Sustained Wind Speeds
1	74 – 95 mph
2	96 – 110 mph
3	111 – 129 mph
4	130 – 156 mph
5	157 mph and above

2.6.3.1 *Texas Hurricane History*

Texas has been described as a state of extreme drought broken with occasional extreme flooding.[28] This is phenomena is illustrated through the history of hurricanes, tropical storms, and depressions. Four of the seven wettest hurricanes in the U.S. have made landfall in Texas.[29] Hurricane Harvey

[28] *State of Texas Hazard Mitigation Plan* Texas Division of Emergency Management, October 2018, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf

[29] Kristen Currie, "Tropical Storm Imelda 7th wettest tropical cyclone on U.S. record," *KXAN, Nexstar Broadcasting*, September 19, 2019, https://www.kxan.com/weather/weather-blog/tropical-storm-imelda-7th-wettest-tropical-cyclone-on-u-s-record/

is the wettest hurricane to hit the U.S. with over 60.58 inches of rainfall recorded at Nederland, Texas.[30] Tropical Storm Imelda is the fourth wettest in Texas with preliminary reports noting approximately 41 inches of rainfall recorded near Beaumont in September 2019.[31]

Table 2-5: Seven Wettest Hurricanes in U.S. History

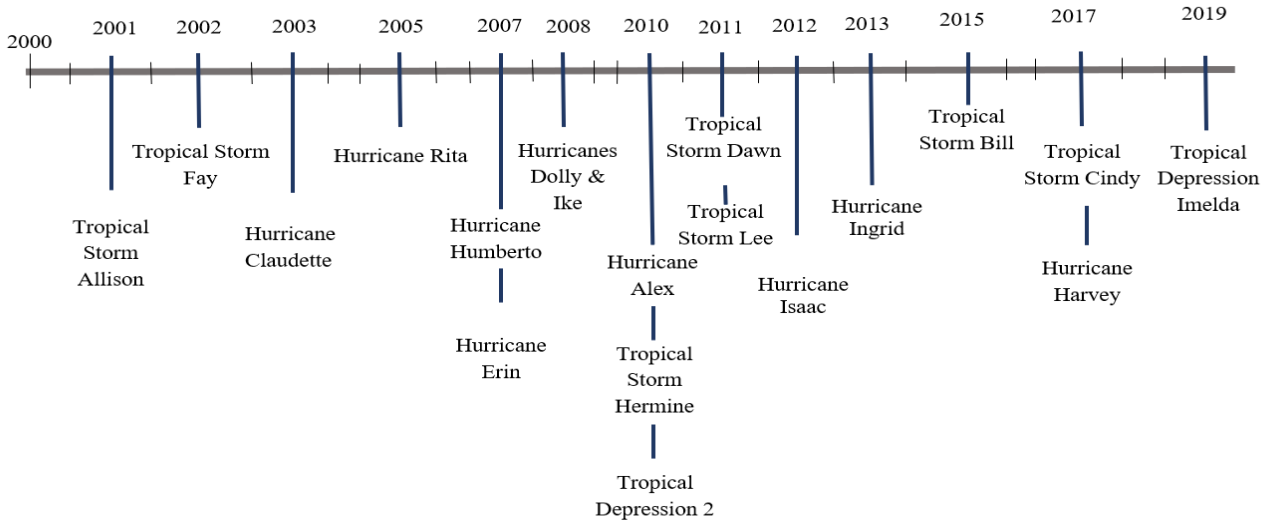
Name of Storm	Year	Highest Rainfall (in inches)
Hurricane Harvey (Texas)	2017	60.58
Tropical Storm Lane (Hawaii)	2018	58
Hurricane Hiki (Hawaii)	1950	52
Tropical Storm Amelia (Texas)	1978	48
Hurricane Easy (Florida)	1950	45.2
Tropical Storm Claudette (Texas)	1979	45
Tropical Storm Imelda (Texas)	2019	40.79[32]

The severity of rain and wind of past hurricanes, tropical storms, and depressions have led to mass destruction and death throughout Texas. The Galveston Hurricane in 1900 is regarded as the deadliest natural disaster in American history; this Category 4 hurricane struck with winds above 135 mph and a 15-foot storm surge that left approximately 6,000 to 12,000 community members dead and 3,600 buildings destroyed.[33]

[30] "State Flood Assessment, Report to the Legislature, 86th Legislative Session," TWDB, January 2019, http://www.texasfloodassessment.com/doc/State-Flood-Assessment-report-86th-Legislation.pdf
[31] Kristen Currie, "Tropical Storm Imelda 7th wettest tropical cyclone on U.S. record," *KXAN, Nexstar Broadcasting*, September 19, 2019, https://www.kxan.com/weather/weather-blog/tropical-storm-imelda-7th-wettest-tropical-cyclone-on-u-s-record/
[32] "Post Tropical Cyclone Report . . . Tropical Storm Imelda," NWSChat, NOAA, September 27, 2019, https://nwschat.weather.gov/p.php?pid=201909272034-KHGX-ACUS74-PSHHGX
[33] "The Galveston Hurricane of 1900: Remembering the deadliest natural disaster in American history," National Ocean Service, NOAA, https://oceanservice.noaa.gov/news/features/sep13/galveston.html

Between 1851 and 2016, 289 hurricanes made landfall in the continental U.S. Of these, 63 made landfall in Texas.[34] Since 2000, over 15 hurricanes, tropical storms or depressions have hit Texas. These include: Tropical Storm Allison (2001), Tropical Storm Fay (2002), Hurricane Claudette (2003), Hurricane Rita (2005), Hurricane Humberto (2007), Hurricane Erin (2007), Hurricane Dolly (2008), Hurricane Ike (2008), Tropical Storm Hermine (2010), [35] Hurricane Alex (2010), Tropical Depression 2 (2010), Tropical Storm Dawn (2011), Tropical Storm Lee (2011), Hurricane Isaac (2012), Hurricane Ingrid (2013), Tropical Storm Bill (2015), Tropical Storm Cindy (2017), Hurricane Harvey (2017), and Tropical Storm Imelda (2019).[36,37]

Figure 2-17: Timeline: Hurricanes/Storms Impacting Texas 2000 – 2019



[34] "Appendix 1: Major Hurricanes in Texas and the U.S.—A Historical Perspective," FiscalNotes, Texas Comptroller, accessed October 2, 2019, https://comptroller.texas.gov/economy/fiscal-notes/2018/special-edition/history.php

[35] Holli Riebeek, "Tropical Storm Hermine," Hurricanes/Tropical Cyclones, NASA, September 10, 2010, https://www.nasa.gov/mission_pages/hurricanes/archives/2010/h2010_Hermine.html

[36] David Roth, "Texas Hurricane History," National Weather Service, January 6, 2010, https://www.weather.gov/media/lch/events/txhurricanehistory.pdf

[37] "2011 Atlantic Hurricane Season," Tropical Cyclone Reports, National Hurricane Center, NOAA, accessed October 2, 2019, https://www.nhc.noaa.gov/data/tcr/index.php?season=2011&basin=atl

2.6.3.2 *Hurricanes Rita, Ike, Dolly, and Harvey*

Hurricanes Rita, Dolly, Ike, and Harvey had an approximate total impact of $283 billion.[38,39,40,41] Each storm presented different challenges, impacts, and risks to both Texas coastal communities and statewide residents.

Figure 2-18: Galveston, Texas, during Hurricane Ike in 2008.[42]

[38] Carol Christian, Craig Hlavaty,"12 Years Ago Hurricane Rita Made Us All Lose Our Minds in Houston," *Houston Chronicle*, September 21, 2017, https://www.chron.com/news/houston-weather/hurricanes/article/Hurricane-Rita-9236850.php
[39] *Hurricane Ike Impact Report*, Texas Engineering Extension Service, TAMU, November 2011, https://www.thestormresource.com/Resources/Documents/Full_Hurricane_Ike_Impact_Report.pdf
[40] "Damage Costs from Hurricane Dolly May Reach $750 M," *Insurance Journal*, August 4, 2008, https://www.insurancejournal.com/magazines/mag-features/2008/08/04/156680.htm
[41] "A storm to Remember: Hurricane Harvey and the Texas Economy," FiscalNotes, Texas Comptroller, accessed October 2, 2019, https://comptroller.texas.gov/economy/fiscal-notes/2018/special-edition/impact.php
[42] Photography by U.S Army Corps of Engineers.

2.6.3.3 *Hurricane Rita*

Hurricane Rita made landfall a week after Hurricane Katrina in September 2005 as a Category 3 hurricane along the Texas-Louisiana Coast. While, Houston was predicted to be in the direct path of Rita, the storm landed along the Sabine River, directly hitting the cities of Port Arthur and Beaumont. Hurricane Rita's storm surge reached 15 feet, combined with 115 mph winds and rain to cause extensive flood and wind damage. Hurricane Rita left 19 people dead and caused $18.5 billion in total damages.[43]

2.6.3.4 *Hurricanes Dolly and Ike*

On July 8, 2008, Hurricane Dolly made landfall 80 miles south of Corpus Christi as a Category 1 hurricane with 80 mph winds and 2 to 3 feet of storm surge. Torrential rains came with this slow-moving storm. No deaths were reported; however, the state sustained over $1 billion in damages.

On September 13, 2008, Hurricane Ike made landfall as a Category 2 hurricane with winds of up to 110 mph and a 20-foot storm surge in the city of Galveston. This storm left 112 people dead with $30 billion in property damage and over $140 billion in economic losses. Due to these losses, Hurricane Ike is one of the most destructive hurricanes in U.S. history.[44]

2.6.3.5 *Hurricane Harvey*

Hurricane Harvey, initially a regenerated tropical depression, made landfall on August 25, 2017, as a Category 4 hurricane near Rockport, bringing with it triple-digit wind gusts and torrential rains; local rainfall totals in Southeast Texas ranged from 20 inches to over 60 inches over 7 days, making it the wettest hurricane in U.S. history.[45] The hurricane caused catastrophic flooding and at least 82 human fatalities,[46] due in part to the weather system stalling over the Texas coast for 6 days. The total impact of Hurricane Harvey reaches beyond $125 billion.

[43] Jon Erdman, "Hurricane Rita Should Never be Forgotten," The Weather Channel, September 22, 2015, https://weather.com/storms/hurricane/news/hurricane-rita-forgotten-louisiana-texas-sep2005#4

[44] "Hurricanes Ike and Dolly," Community Development and Revitalization, GLO, accessed October 2, 2019, http://www.glo.texas.gov/recovery/files/hurricane-ike-disaster-overview.pdf

[45] *Hurricane Harvey in Texas, Mitigation Assessment Team Report*, (FEMA P-2022), FEMA, February 2019, https://www.fema.gov/media-library-data/1551991528553-9bb91b4bfe36f3129836fedaf263ef64/995941_FEMA_P-2022_FINAL_508c.pdf

[46] Eva Moravec, "Texas officials: Hurricane Harvey death toll at 82, 'mass casualties have absolutely not happened,'" *Washington Post,* September 14, 2017, https://www.washingtonpost.com/national/texas-officials-hurricane-harvey-death-toll-at-82-mass-casualties-have-absolutely-not-happened/2017/09/14/bff3ffea-9975-11e7-87fc-c3f7ee4035c9_story.html?utm_term=. dfe744e2fbe8

2.6.4 FEMA's Community Lifelines for Hurricanes, Tropical Storms, and Depressions

2.6.4.1 *Safety and Security*

Risks: The unpredictability and immensity of hurricanes, tropical storms, and depressions create the potential for chaotic response efforts and damage to public services and infrastructure. The scope of these types of hazards creates the potential need for thousands of first responders to aid impacted areas. On-the-ground responders, helicopter and boat rescues from federal and local teams, and nonprofit organizations are all a part of this potential need. An example of one of the local teams is the Texas A&M Engineering Extension Service's Task Force 1; this one team has over 240 active responders including helicopter and water rescuers.[47] A first responder nonprofit rescue group, TEXSAR, has 397 active members including 50 rescue boat operators, 138 ground responders, and 111 flood and swift water technicians.[48] These two organizations are just two examples of the thousands of federal, state, and local first responders that deploy during hurricanes, tropical storms, and depressions.

Figure 2-19: Members of the South Carolina's Helicopter Aquatic Rescue Team and the Texas Task Force perform rescue operations in Port Arthur during Harvey.[49]

[47] Texas A&M Task Force 1, Urban Search & Rescue, accessed October 2, 2019, https://texastaskforce1.org/
[48] TEXSAR Texas Search and Rescue, accessed October 2, 2019, https://www.texsar.org/about-us/
[49] Photography by Staff Sergeant Daniel J. Martinez, U.S. Air National Guard.

While emergency management is highly organized throughout Texas, the total number and diversity of first responders needed during a hurricane, tropical storm or depression, creates the risk of disorganization. The state has identified a need for additional training and coordination among all partners and teams working on response efforts.[50]

Figure 2-20: Texas National Guard members work with local responders in Victoria, Texas, during Hurricane Harvey.[51]

In addition to this vast first responders' network, there is a complex network of government service providers and infrastructure in the path of hurricanes. In southwest Texas alone there are over 130 individual towns or cities that make up the Gulf Coast region; each community has its own city hall, school system, police department, correctional facilities, and other community services and infrastructure;[52] these facilities each have the potential to sustain wind damage or flooding. These damages can prevent students from going back to school or delay government services for a sustained period.

Impacts: The potential for damage and disorganized response efforts may lead to economic losses as well as injuries and further loss of life. For example, the vast number of individuals working on rescue efforts made it difficult during Hurricane Harvey to coordinate rescue efforts throughout impacted communities. City halls and emergency management centers were flooded throughout

[50] *Eye of the Storm, Report of the Governor's Commission to Rebuild Texas*, Texas A&M University System, November 2018, page 83, https://www.rebuildtexas.today/wp-content/uploads/sites/52/2018/12/12-11-18-EYE-OF-THE-STORM-digital.pdf
[51] Photography by Captain Martha Nigrelle, Army National Guard.
[52] "Regional Directory," H-GAC, accessed October 4, 2019, https://www.h-gac.com/regional-directory/default.aspx

the impacted areas making response more challenging. Major roadways were flooded or blocked with debris during past hurricanes, tropical storms, and depressions.

Consequently, even if emergency centers or city halls were not flooded, responders could not reach these centers or put themselves in danger trying to do so. The command structure during of Hurricane Harvey was further challenged by confusion over assigned roles resulting from the inability of responders to reach their assigned destinations due to blocked or flooded roadways, and their subsequent replacement by those responders who did not face those obstacles.[53]

2.6.4.2 *Communications*

Risks: The severe winds that accompany hurricanes, tropical storms, or depressions have the potential to destroy powerlines, communication towers, and other similar equipment. This creates a situation where community members may not be able to reach out for help. Impacted communication systems may also impede first responders by impeding the flow of information between colleagues and disrupting coordinated efforts.

The vast network of responders after a hurricane, tropical storm, or depression bring a variety of communication systems and protocols to the impacted area, creating a potential for communication failure or confusion between different response groups. The variety of current social media platforms add to the potential confusion not only between responders, but with community members needing assistance.

These dual communication issues create the opportunity for misinformation to be spread, with vast amounts of critical information being shared, yet limited staff capacity to address community members' concerns. With the rains and winds that accompany hurricanes, tropical storms, and depressions, this gap in communications between differing systems and protocols on the one hand, and the deluge of communication through social media on the other, creates the opportunity for uncertainty in prioritizing the provision of resources and rescue efforts and activities. This uncertainty has the potential to lead to responders venturing out into unknown wind or flooding conditions and community members not getting the assistance that they need when they are trapped in high water.

In addition to communication risk, the potential economic impact of hurricanes, tropical storms, and depressions can be compounded due to the vast number of industries that can be in the direct path of a hurricane, tropical storm, or depression, as well as any industries related to these major sectors inside and outside of the impacted areas. This may be particularly true of communities where there is a concentration of a particular industry. Along Texas's Gulf Coast, the oil and gas

[53] Jen Para, "Harris County Publishes Report on Hurricane Harvey," *Houston Business Journal*, May 29, 2018, https://www.bizjournals.com/houston/news/2018/05/29/harris-county-publishes-report-on-hurricaneharvey.html

industry is dominant, with approximately 1 out of 3 jobs in the region in this industry.[54] The flooding and high winds that come with hurricanes have the potential to damage oil refiners, close major ports in the region that export these products, and close or damage other major transportation infrastructure. Damage and closures can lead to a production halt or delay in the oil and gas industries, as well as all other goods that are imported or exported from these facilities. Adding to this complexity are personal property losses of community members in the impacted communities.

Impacts: During Hurricane Harvey, approximately 336,000 customers lost power, compared to 4.5 million customers during Hurricane Ike.[55] During Hurricane Harvey, the Federal Communications Commission reported that three Texas counties had cellular outages greater than 80 percent.[56] Power outages and cell site failures were due in part from the flooding of substations, water damage to related equipment, and downed powerlines throughout the impacted area.[57]

Along with power outages, overwhelmed and incohesive communication systems lead to prolonged wait times for those in need. Hurricane Harvey overwhelmed traditional emergency systems, leading to individuals reaching out through non-traditional means. Community members could not reach 911 during Hurricane Harvey, due to the vast number of individuals trying to call, which led residents to call 311 and 211 instead; there were over 21,000 calls to 211 just in the city of Houston during the week of Hurricane Harvey.[58] Community members also reached out through social media. This led to confusion over where to direct resources.

Along with community members calling for help, the Texas Division of Emergency Management was overwhelmed with calls from local government staff and officials needing assistance. Similarly, during Tropical Storm Imelda, the city of Beaumont's police department was overwhelmed with 911 calls.[59]

[54] "2014–2018 Comprehensive Economic Development Strategy," Gulf Coast Economic Development District, H-GAC, http://www.h-gac.com/gulf-coast-economic-development-district/regional-economic-development-plan.aspx

[55] Travis Bubenik, "Though Power Outages Were Limited, Harvey Revealed New Challenges for the Grid," Houston Public Media, University of Houston, November 2, 2017, https://www.houstonpublicmedia.org/articles/news/energy-environment/2017/11/02/248175/though-power-outages-were-limited-harvey-revealed-new-challenges-for-the-grid/

[56] "Presentation on FCC Response to Hurricanes Harvey, Irma and Maria" Federal Communications Commission, September 26, 2017, https://www.fcc.gov/document/presentation-fcc-response-hurricanes-harvey-irma-and-maria

[57] Ryan Maye Handy, Fernando Alfonso III, "Power outages reported in wake of Hurricane Harvey," *Houston Chronicle*, August 30, 2017, https://www.chron.com/news/houston-weather/hurricaneharvey/article/Houston-still-has-power-power-loss-for-hundreds-11968986.php#photo-13912902

[58] "Hurricane Harvey Relief Fund Needs Assessment Phase One," Rice University Kinder Institute for Urban Research, November 2017, https://kinder.rice.edu/sites/g/files/bxs1676/f/documents/Phase1_PostHarveyAssessment_11130217-2.pdf

[59] Manny Fernandez, Margaret Toal, Rick Rojas, Sarah Mervosh, Nicholas Bogel-Burroughs, John Schwartz, Adeel Hassan, "Imelda Swamps Texas with Flooding Rain," *New York Times*, September 20, 2019,

Major economic impacts were also seen during past storms including Hurricane Harvey, Ike, and Dolly. The total verified business loss from Hurricane Harvey was approximately $5.91 billion;[60] approximately 14 oil refineries shut down during Hurricane Harvey accounting for over 17 percent of the nation's gas refining capabilities. Ports in and around Houston shutdown for approximately a week accounting for more than $2.5 billion in economic losses alone.[61] Hurricane Ike also had a large economic impact. During Hurricane Ike, approximately, 26 percent of the total Texas business establishments were in the path of the hurricane, with small locally owned business seeing much of the impact.

Figure 2-21: Bolivar Peninsula, Texas, after Hurricane Ike.[62]

Along with the economic impacts, significant damage and destruction of homes are also a direct consequence of past hurricanes. Approximately 3.4 billion in total home damages were caused by Hurricane Ike. Additionally, approximately 109,045 applicants were approved for FEMA's

https://www.nytimes.com/2019/09/19/us/houston-beaumont-flooding-imelda.html

[60] "2017 Hurricane Harvey" Community Development and Revitalization, Texas General Land Office, accessed October 1, 2019, https://recovery.texas.gov/action-plans/hurricane-harvey/index.html

[61] *Eye of the Storm, Report of the Governor's Commission to Rebuild Texas*, Texas A&M University System, November 2018, page 23, https://www.rebuildtexas.today/wp-content/uploads/sites/52/2018/12/12-11-18-EYE-OF-THE-STORM-digital.pdf

[62] Photography by National Weather Service, September 2008, https://www.weather.gov/hgx/projects_ike08_bolivar2

housing assistance program totaling over $20 million.[63] In some instances, as in the case of the small town of Bridge City located along the Gulf Coast where only 14 of 3,400 homes remained inhabitable after Hurricane Ike, the entire housing stock of a community was destroyed.[27]

A similar situation was seen during Hurricane Harvey where over 300,000 homes were destroyed.[64] 892,263 individuals applied for FEMA's Individual Assistance with 132,458 of these applicants having unmet needs.[65] Hurricane Harvey also illustrates another way in which hurricanes impact housing – a decrease in affordable housing stock.[66]

Figure 2-22: Flooding in Port Arthur, Texas, during Hurricane Harvey.[67]

At present, the economic and housing impacts of Tropical Depression Imelda are still to be reported. As of September 19, 2019, Winnie, Texas reported approximately 500 to 2,000 homes

[63] *Hurricane Ike Impact Report*, Texas Engineering Extension Service, TAMU, November 2011, https://www.thestormresource.com/Resources/Documents/Full_Hurricane_Ike_Impact_Report.pdf
[64] Pam Fessler, "At Least 100,000 Homes Were Affected by Harvey. Moving Back in Won't Be Easy," *NPR*, September 1, 2017, https://www.npr.org/2017/09/01/547598676/at-least-100-000-homes-were-affected-by-harvey-moving-back-in-wont-be-easy
[65] *State of Texas Plan for Disaster Recovery: Amendment 3, Hurricane Harvey–Round 1*, Community Development and Revitalization, GLO, April 20, 2019, https://recovery.texas.gov/files/hud-requirements-reports/hurricane-harvey/5b-sap-amend3-approved.pdf
[66] "Another Blow from Harvey: Houston Home Prices, rents likely to Rise," *Reuters*, September 1, 2017, https://www.reuters.com/article/us-storm-harvey-realestate/another-blow-from-harvey-houston-home-prices-rents-likely-to-rise-idUSKCN1BC5QY
[67] Photography by Staff Sergeant Daniel J. Martinez, U.S. Air National Guard.

were flooded due to the storm. Jefferson County reported that 50 households were waiting to be rescued as of September 19; Jefferson County homes that did not flood during Hurricane Harvey did so during Tropical Storm Imelda. As of September 24, 2019, impacted counties self-reported that there were over 5,000 homes affected and there was over $24.5 million in public infrastructure damage due to Tropical Storm Imelda (DR-4466).[68,69]

2.6.4.3 *Food, Water, Sheltering*

Risks: The deluge of water and high winds that come with hurricanes, tropical storms, and depressions have the potential to close grocery stores, destroy crops, and damage water and waste-water treatment plants and other critical infrastructure such as shelters and major roadways acting as evacuation routes. Debris in the roadways from severe winds and flood water cut off roadways or damage powerlines; this creates the potential for all types of businesses to close including grocery stores and restaurants. Water and wastewater treatment plans are susceptible to damage or are shut down due to overcapacity.

In terms of agriculture at risk, the SHMP identifies Texas as the state with the largest acreage of agricultural lands throughout the U.S., accounting for approximately 248,900 farms and ranches; together they generate approximately $20 billion in annual revenue.[70] The SHMP also points to cattle and cotton as the top two agricultural commodities in the state. South and Southeast Texas are not only where a large proportion of crops such as cotton are grown, but also where distribution points and ports are located. Landfall of a hurricane, tropical storm, or depression in these regions could not only lead to crop losses but impede the movement of all types of products to market as distribution centers, major roadways, or ports are closed due to flooding or debris.

The current SHMP also speaks to the current availability and condition of emergency shelters in Texas. The SHMP discusses the state's efforts to incorporate shelters at approximately 100 highway rest stops throughout the state.[71] These auxiliary shelters do run the risk of flooding that impact highways during storms, which can render them inaccessible. In addition to these new

[68] Robert Downen and Doug Begley, "A Switch from Response to Recovery After Imelda," *Houston Chronicle*, September, 23, 2019, https://www.houstonchronicle.com/news/houston-texas/houston/article/Officials-seek-donations-for-Imelda-fund-urge-14462011.php

[69] John Bacon and Kristin Lam, "'Worse than Hurricane Harvey': At least 2 dead as Imelda overwhelms Texas with' incredibly dangerous' flooding," *USA Today*, September 19, 2019, https://www.usatoday.com/story/news/nation/2019/09/19/texas-flooding-storm-imelda-hits-winnie-beaumont-dangerous-rain/2372220001/

[70] "Texas Ag Stats," Texas Department of Agriculture, accessed, October 2, 2019, https://www.texasagriculture.gov/About/TexasAgStats.aspx

[71] "Safety Rest Area Map," Texas Department of Transportation, accessed, October 2, 2019, https://www.txdot.gov/inside-txdot/division/maintenance/rest-areas-map.html

sheltering options, existing local shelters are becoming more critical during these large-scale weather events.

Evacuation routes are also at risk of being flooded or blocked with debris. The SHMP does not describe the evacuation routes throughout the state, but there are approximately 130 major evacuation routes and 18 potential counter flow and EvacuLanes throughout Texas.[72] These evacuation routes are concentrated in Southeast and South Texas to provide a way out for Texans evacuating from a hurricane, tropical storm, or depression; however, during past events, many of these routes became impassable or were overwhelmed with traffic that resulted in traffic jams.

Impacts: Loss of life, injuries, and economic losses are all potential consequences of closed or flooded grocery stores, water treatment facilities, shelters, damaged crops, and flooded or blocked evacuation routes. For example, during Hurricane Ike, 137 Walmarts, 40 Targets, 149 Burger Kings, and all Kroger stores were temporarily closed throughout the impacted area, while HEB had to permanently close a store in the city of Galveston due to extensive water damage from the hurricane.[73,74, 75] Although grocery stores and other businesses such as home improvement stores did need to shut down for a period of time, these types of stores often see a boost in activity right before and right after such events due to individuals rushing to prepare for the storm and then to purchase items to recover after a storm.

Wastewater treatment plants needed to close or were damaged due to past hurricanes as was the case during Hurricane Harvey where 40 waste water treatment plants were either offline or closed, and 61 public water drinking systems rendered inoperable.[76]

[72] "TxDOT Evacuation Routes," Texas Department of Transportation, accessed, October 2, 2019, https://gis-txdot.opendata.arcgis.com/datasets/txdot-evacuation-routes
[73] "H-E-B will not Reopen Damaged Galveston Store," *San Antonio Business Journal*, September 25, 2008, https://www.bizjournals.com/sanantonio/stories/2008/09/22/daily33.html
[74] Martinne Geller, "Retailers grapple with impacts of Hurricane Ike," *Reuters*, September 14, 2008, https://www.reuters.com/article/us-hurricane-retail/retailers-grapple-with-impacts-of-hurricane-ike-SN1445556420080914
[75] Katherine Blunt, "Flooding After Harvey Too Much for Retailers, Grocers; Many Close Sunday Afternoon," *Houston Chronicle*, August 27, 2017, https://www.chron.com/news/houston-weather/hurricaneharvey/article/Houston-retailers-close-stores-to-assess-Harvey-12003495.php
[76] "Hurricane Harvey After Action Report," Texas Commission on Environmental Quality, April 3, 2018, https://www.tceq.texas.gov/assets/public/response/hurricanes/hurricane-harvey-after-action-review-report.pdf

Figure 2-23: City of Conroe's wastewater treatment plant during Hurricane Harvey.[77]

In the city of Conroe, the sole wastewater plant serving approximately 82,000 people flooded and closed during Hurricane Harvey. This plant typically treats around 5 million gallons of wastewater per day; during the 5 days the plant was down, wastewater flowed directly into the San Jacinto River.[78] This is just one example of how waterways were impaired due to past hurricanes; the significant and wide-reaching effects of Hurricane Harvey and other past hurricanes on water quality is still being researched.[79, 80, 81,82]

In addition to water quality challenges, past hurricanes had significant consequences for evacuations, agriculture and shelters. During Hurricane Rita, 72 people died trying to evacuate

[77] Photography by Captain Matthew A. Roman, U.S. Army Reserves.
[78] Paul Wood, "Healing from Harvey," *Water & Wastes Digest*, September 10, 2018, https://www.wwdmag.com/storm-water/healing-harvey
[79] "Fecal bacteria contaminated surface water after Hurricane Harvey," *Science Daily*, August 1, 2018, https://www.sciencedaily.com/releases/2018/08/180801093703.htm
[80] Frank Bajak, "Hurricane Harvey's Toxic Impact Deeper Than Public Told," *Associated Press*, March 23, 2018, https://www.apnews.com/e0ceae76d5894734b0041210a902218d
[81] Alex Stuckey, "3 wastewater treatment plants offline with $1M in damages caused by Harvey," *Houston Chronicle*, November 10, 2017, https://www.houstonchronicle.com/news/houston-texas/houston/article/3-wastewater-treatment-plants-offline-with-1M-in-12348390.php
[82] Allison Lee, "Study: Harvey Aftermath Affected Gulf of Mexico Water Quality," *Houston Public Media*, August 6, 2018, https://www.houstonpublicmedia.org/articles/news/2018/08/06/298705/study-harvey-aftermath-affected-gulf-of-mexico-water-quality/

before the hurricane reached Texas; this affected the decision, during Hurricane Harvey, to not evacuate certain communities, such as the city of Houston.[83] Finally, even though there were approximately 692 shelters operating during Hurricane Harvey, several shelters needed to be evacuated due to inundation with flood water.

Within the agriculture sector, Texas AgriLife estimated that there was more than $200 million in crop losses from Hurricane Harvey.[84]

2.6.4.4 *Transportation*

Risks: Damage from hurricanes, tropical storms, and depressions can cause short and long-term effects to how people are able to move through and around an impacted area; wind-damaged transportation infrastructure, flooded streets, flooded personnel and shared vehicles, hampered public transportation systems, adjusted flight paths, and crippled rail lines can all affect the social and economic functions of a community and region. The movement of goods and services needed for the operational functions of commercial businesses can also be impacted by limited mobility options.

Rescue missions by ground transportation, waterway transportation, or aerial transportation may not be safe or viable depending on the level of flooding, wind variability, or debris inundation. Limited mobility, especially during heavy rain and high wind events caused by these storms, can also limit the ability of first responders to access people who are in need of potentially life-saving assistance. To that end, the State of Texas Emergency Assistance Registry (STEAR) program allows those who may not be able to evacuate or receive assistance on their own to register and allow local officials to know who they are and where they are in case of emergency.[85] Elderly individuals who may have difficulty evacuating and may not be able to drive or have trouble taking public transit must be considered during large-scale evacuations; also critical to consider is the fact that there are over 3,100 nursing homes in Texas, a state with a growing elderly population.[86]

Ports and inland waterways may also be impacted by storm surge and other factors associated with tropical weather systems to a point where tangible goods cannot be delivered and distributed.

[83] *Eye of the Storm, Report of the Governor's Commission to Rebuild Texas*, Texas A&M University System, August 2018, https://www.rebuildtexas.today/wp-content/uploads/sites/52/2018/12/12-11-18-EYE-OF-THE-STORM-digital.pdf
[84] "Texas agricultural losses from Hurricane Harvey estimated at more than $200 million," AgriLife Today, October 27, 2017, https://today.agrilife.org/2017/10/27/texas-agricultural-losses-hurricane-harvey-estimated-200-million/
[85] "State of Texas Emergency Assistance Registry (STEAR) – Public," Texas Division of Emergency Management, https://tdem.texas.gov/stear/
[86] "Homeland Infrastructure Foundation-Level Data (Nursing Homes)," United States Department of Homeland Security, https://hifld-geoplatform.opendata.arcgis.com/datasets/nursing-homes

Commercial transportation services to local communities is impaired if roads are impassable and air support is limited.[87]

Impacts: During Hurricane Harvey, 781 roads across Southeast Texas were impassable at some point in time.[88] This limited direct access to critical human services and the ability of first responders to access individuals who needed assistance. Conditions can also potentially hinder evacuation orders, as these are made by the chief elected official of a local government; the current SHMP notes that mandatory evacuations were issued for 779,000 people in Texas, with an additional 980,000 people evacuating voluntarily during Hurricane Harvey.[89]

These numbers show the importance of incorporating mitigation and resiliency measures into ground transportation infrastructure before a storm hits. However, ground transportation was not the only form of mobility hampered during Hurricane Harvey. George Bush Intercontinental Airport (IAH) and William P. Hobby Airport (HOU), the two main airports in Southeast Texas, were closed for nearly one week; an estimated $32 million in revenue was lost during this time in the commercial airline industry.[90] During the 2018 fiscal year, IAH averaged 113,715 daily passengers and HOU averaged 37,867 daily passengers.[91] This shows the impact a 1-week closure can have on traveler thoroughfare through these airports. Other forms of aviation were also impacted during Harvey in a way that was not expected, which can be seen within the first 6 days after the storm hit. During this time period, the Federal Aviation Administration issued more than 40 authorizations for emergency drone activities above Houston and the surrounding area. The duties of these aerial drones ranged from inspecting roadways, checking railroad tracks, assessing the condition of water and wastewater plants, monitoring oil refineries, and evaluating power lines.[92] In addition, state response personnel task forces eventually accounted for 841 rescues by air.[93]

[87] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 58, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[88] *Eye of the Storm, Report of the Governor's Commission to Rebuild Texas*, Texas A&M University System, November 2018, page 4, https://www.rebuildtexas.today/wp-content/uploads/sites/52/2018/12/12-11-18-EYE-OF-THE-STORM-digital.pdf
[89] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 452, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[90] "Assessment of Hurricane Harvey's impact on aviation 2017," *International Air Transport Association*, October 2017, https://www.iata.org/publications/economics/Reports/Hurricane-harvey-impact-on-aviation.pdf
[91] Houston Airport System, "Statistical Report: 2018 Fiscal Year Summary," city of Houston, https://d14ik00wldmhq.cloudfront.net/media/filer_public/52/4e/524ee321-a729-474b-89d8-5ccceba5406e/fy18_report_final.pdf
[92] *Eye of the Storm, Report of the Governor's Commission to Rebuild Texas*, Texas A&M University System, November 2018, page 140, https://www.rebuildtexas.today/wp-content/uploads/sites/52/2018/12/12-11-18-EYE-OF-THE-STORM-digital.pdf
[93] *Eye of the Storm, Report of the Governor's Commission to Rebuild Texas*, Texas A&M University System, November 2018, page 62, https://www.rebuildtexas.today/wp-content/uploads/sites/52/2018/12/12-11-18-EYE-OF-THE-STORM-digital.pdf

Maritime transportation, such as port and ship channel entry and exit, was drastically limited. In all, 23 Texas ports were closed during Harvey, including the Port of Corpus Christi, Port of Port Arthur, Port of Galveston, and many others. [94,95] This also included the Port of Houston (Houston Ship Channel) which, in 2018, accounted for $339 billion in the state's economic value, 20.6 percent of Texas' gross-domestic product (GDP), and more than 1.35 million jobs across Texas. Nearly $5.7 billion in state and local tax revenues are generated by business activities related to the Port of Houston yearly.[96] It is estimated that the closing of the Port of Houston, during and after Hurricane Harvey, equated to more than $2.5 billion in economic losses due to delays and cancelled transactions.[97]

Figure 2-24: Evacuations during Hurricane Rita in Spring, Texas.[98]

[94] "Historical Disaster Response to Hurricane Harvey," Federal Emergency Management Agency, September 22, 2019, https://www.fema.gov/news-release/2017/09/22/historic-disaster-response-hurricane-harvey-texas

[95] "Factbox: Major Texas ports remain mostly closed due to Storm Harvey," *Reuters*, September 1, 2019, https://www.reuters.com/article/us-storm-harvey-ports-factbox/factbox-major-texas-ports-remain-mostly-closed-due-to-storm-harvey-idUSKCN1BC5FY

[96] "The Economic Impact of the Houston Ship Channel," Port of Houston, April 5, 2019, https://porthouston.com/about-us/economic-impact/

[97] *Eye of the Storm, Report of the Governor's Commission to Rebuild Texas*, Texas A&M University System, November 2018, page 62, https://www.rebuildtexas.today/wp-content/uploads/sites/52/2018/12/12-11-18-EYE-OF-THE-STORM-digital.pdf

[98] Photograph by Ashish, September 21, 2005, https://theconversation.com/thousands-of-people-didnt-evacuate-before-hurricane-matthew-why-not-66724

2.6.4.5 *Health and Medical*

Risks: The SHMP emphasizes that hurricanes, tropical storms, and depressions can pose significant threats to public health and safety. Hospitals and medical facilities face enormous pressure when a hurricane, tropical storm, or depression makes land fall, as medical emergencies become common occurrences and fatality management becomes critical. Hospital patients may face long wait times, difficulty being transported to a more adequate facility, or a complete lack of health care providers open to accepting patients. Community members, first responders, and general response crews face dangerous conditions in the context of tropical weather systems, as conditions during and following hurricanes can be uncomfortable and pose numerous health risks. Dangers such as high water, downed electrical power lines, and broken gas mains are major health and safety threats after hurricanes, together with consumption concerns stemming from a potentially contaminated food and water supply.[99] Due to the evacuation of staff, public health advisories and reports of public health concerns may also be limited in their ability to reach the public. This issue during tropical weather systems is only compounded by power outages and a potential loss of communication signals and lines.

Impacts: Hurricane Harvey led the closure of 16 hospitals throughout Texas, necessitating the relocation of nearly 1,000 patients. After the direct impact of the storm, many local hospitals and clinics were either too damaged to operate or were too overwhelmed with patients to function.[100] Driscoll Children's Hospital, located in Corpus Christi, had to evacuate all 10 new-born babies in its neonatal intensive care unit several local emergency room services closing down as well.[101] Lake Arthur Place, a nursing home and rehabilitation facility in Port Arthur, had to evacuate as it was reported that some community members had no other option but to stay in the flooded location for up to 24 hours.[102] As Tropical Storm Imelda made landfall near Freeport in Southeast Texas during mid-September 2019, the Chambers County Office of Emergency Management posted on their Facebook page that the Riceland Hospital in Winnie had to be evacuated.[103] During this same

[99] "Hurricanes," Texas Department of State Health Services, accessed October 4, 2019, https://www.dshs.texas.gov/preparedness/hurricanes.shtm

[100] *Eye of the Storm, Report of the Governor's Commission to Rebuild Texas*, Texas A&M University System, November 2018, page 122, https://www.rebuildtexas.today/wp-content/uploads/sites/52/2018/12/12-11-18-EYE-OF-THE-STORM-digital.pdf

[101] Alyssa Rege, "Texas hospitals and Hurricane Harvey: 8 things to know Friday," *Becker Hospital Review*, August 25, 2017, https://www.beckershospitalreview.com/patient-flow/texas-hospitals-and-hurricane-harvey-8-things-to-know-friday.html

[102] Jen Christensen, "Some hospitals hang on as others close amid Harvey's floods," *CNN*, August 31, 2017, https://www.cnn.com/2017/08/30/health/harvey-houston-hospitals/index.html

[103] Chambers County Emergency Management, "Significant flooding occurring in Winnie," *Facebook*, September 19, 2019, https://www.facebook.com/ChambersCountyEmergencyManagement/

event, a hospital in Beaumont was also flooded and evacuated, while two hospitals in Orange County—Christus St. Elizabeth and Baptist—were cut off by flood waters.[104]

As a result of Tropical Storm Allison in 2001, the Texas Medical Center hospitals located in Houston lost $2 billion from flood damage; subsequently, $50 million was invested in storm mitigation measures to make the hospitals more resilient. When Hurricane Harvey hit, the Texas Medical Center was able remain operational due to lessons learned and the watertight floodgates that were installed after Allison to protect all basements and subterranean parking.[105]

Fatality management, the process of properly recovering, handling, identifying, transporting, tracking, storing, and disposing of human remains and personal effects, especially during a tropical weather system, is vital in public health measures that need to be addressed before, during, and after landfall of a storm.[106] Before Hurricane Rita, 73 people died in a chaotic evacuation before the storm even hit Texas. This number represents more than half of the 139 total deaths accredited to Rita. This shows that measures for fatality management must be in place before the weather-related impacts of a storm are felt.

Figure 2-25: Hurricane Harvey floodwaters approach Ben Taub Hospital in Houston.[107]

[104] Ron Brackett, "Two Die in Devastating Texas Floods; Hundreds Rescued in Wake of Imelda's Torrential Rails," *The Weather Channel*, September 19, 2019, https://weather.com/news/news/2019-09-19-tropical-depression-imelda-impacts-southeast-texas-flooding
[105] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 457, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[106] "Capability 5: Fatality Management," Centers for Disease Control, accessed October 4, 2019, https://www.cdc.gov/cpr/readiness/00_docs/capability5.pdf
[107] Photograph by Andrew Kragie, *Associated Press*, August 30, 2017, https://www.washingtonpost.com/national/health-science/some-hospitals-evacuated-but-houstons-vaunted-medical-world-mostly-withstands-harvey/2017/08/30/2e9e5a2c-8d90-11e7-84c0-02cc069f2c37_story.html

2.6.4.6 *Hazardous Material (Management)*

Risks: Hazardous material facilities are facilities involved in the production, storage, and/or transport of corrosives, explosives, flammable materials, radioactive materials, and toxins.[108] Flooding, high wind, the movement of debris, storm surge, damaged marine vessels, and breached off-shore oil infrastructure can lead to movement of these materials away from their facilities.

There are 66 solid waste facilities within all counties that border the Gulf of Mexico or border the Gulf's adjacent bays in Texas. This includes 30 solid waste facilities in Houston's city limits alone and speaks to the importance of critically safeguarding the movement of potential hazardous materials during tropical weather events.[109] If not contained correctly and efficiently, this can lead to impacts that can be felt on public and environmental health systems that may persist for years after a storm has made its immediate effects felt. The SHMP puts emphasis on the importance of critical facility protection, including hazardous material storage and production facilities, being mitigated during hurricanes and similar weather events. The South Texas Nuclear Generating Station, a case in point, is one of three nuclear power stations in Texas. Located southwest of Bay City and roughly 3 miles from Matagorda Bay and 15 miles from the Gulf of Mexico, this nuclear power station could itself become a potential hazard during a hurricane event. However, during Hurricane Harvey, there were no reported issues at this location.

Impacts: During and after Hurricane Harvey, the EPA determined that 13 Superfund sites were flooded, and 11 separate Superfund sites were not accessible by response personnel. This lack of ground transportation access to the Superfund sites may prove consequential in the years to come, as the effects of hazardous material penetration into environmental ecosystems can take decades to fully manifest.[110] Further, in the aftermath of Hurricane Harvey, reporters cataloged more than 266 hazardous spills and discharges on land, water, and the air.[111] Roughly 500 chemical plants, 10 refineries, and more than 6,670 miles of intertwined oil, gas, and chemical pipelines were also located in the impact zone of Harvey, making this area of Texas the nation's most significant energy corridor. At least 14 oil refineries, accounting for 17.6 percent of the nation's gasoline refining capacity, shut down during Harvey. Nearly half a billion gallons of industrial wastewater,

[108] *Eye of the Storm, Report of the Governor's Commission to Rebuild Texas*, Texas A&M University System, November 2018, page 122, https://www.rebuildtexas.today/wp-content/uploads/sites/52/2018/12/12-11-18-EYE-OF-THE-STORM-digital.pdf

[109] "Homeland Infrastructure Foundation-Level Data (Solid Waste Landfill Facilities)," United States Department of Homeland Security, accessed October 4, 2019, https://hifld-geoplatform.opendata.arcgis.com/datasets/solid-waste-landfill-facilities?geometry=-102.92%2C28.968%2C-95.982%2C30.636

[110] "Status of Superfund Sites in Areas Affected by Harvey," United States Environmental Protection Agency, September 2, 2019, https://www.epa.gov/newsreleases/status-superfund-sites-areas-affected-harvey

[111] "EPA/TCEQ: Updated Status of Systems affected by Harvey," Texas Commission on Environmental Quality, September 24, 2019, https://www.epa.gov/newsreleases/epatceq-updated-status-systems-affected-harvey-2

mixed with stormwater, leaked from a single chemical plant in Baytown on the upper shores of Galveston Bay. Benzene, vinyl chloride, butadiene and other known human carcinogens were among the dozens of tons of industrial toxic substances released into neighborhoods and waterways following the rain event with Harvey.[112]

2.6.4.7 *Energy (Power & Fuel)*

Risks: Hurricanes, tropical storms, and depressions can bring sustained wind damage and, eventually, downed power lines which lead to short and long-term power outages. Flooding events, associated with tropical systems, have been known to also bring power outages as substations and other critical power grid locations or equipment may be underwater or have limited access due to high water. Power outages can be deadly occurrences, especially during the summer and early fall heat that is seen during hurricane season in Texas. Critical facilities that are without power have their operations depreciated and are not able to provide potentially life-saving services. During the 2017 Hurricane Season, FEMA noted that they "faced challenges supplying limited temporary power generation capacity."[113] This highlights the need for states and local governments to have and invest in resilient power systems while also having an ability to provide temporary power resources. Without temporary power resources during a tropical weather event, lives will be put in danger and fuel capacity for individuals and first responders attempting to reach individuals in distress will be vulnerable. If fuel capacity is limited due to gas stations risk running low on fuel for personal and response vehicles, along with generators, evacuation and recovery for individuals is made much more difficult. With 18 percent of petroleum refineries in the United States located in Texas (as of 2015), impacts to the oil industry in the state are felt across the country through fuel capacity and availability factors.[114]

Impacts: According to the North American Electric Reliability Corporation, over 2 million customers' power services were affected by Hurricane Harvey. Over 850 transmission structures were downed or damaged, over 6,200 distribution poles were also downed or damaged, and over 800 miles of transmission and distribution conductors had to be replaced. It was observed that over 90 substations were damaged and over 12,000 energy employees and contractors were utilized in

[112] Frank Bajak and Lise Olsen, "Silent Spills: Environmental Damage from Hurricane Harvey is Just Beginning to Emerge," *Houston Chronicle*, March 22, 2018, https://www.chron.com/news/%20houston-weather/hurricaneharvey/article/Silent-Spills-Environmental-damage-from-12768677.php

[113] *2017 Hurricane Season FEMA After-Action Report 2018*, Federal Emergency Management Agency, page iii, July 12, 2018, https://www.fema.gov/media-library-data/1533643262195-6d1398339449ca85942538a1249d2ae9/2017FEMAHurricaneAARv20180730.pdf

[114] "State of Texas: Energy Sector Risk Profile," United States Department of Energy, Page 4, accessed October 4, 2019, https://www.energy.gov/sites/prod/files/2015/06/f22/TX_Energy%20Sector%20Risk%20Profile.pdf

the restoration of Texas' power grid during the aftermath of Harvey.[115] Due to the impacts of the hurricane, about 4.4 million barrels of oil had to be taken temporarily offline, roughly 25 percent of the national capacity.[116]

Figure 2-26: Downed utility lines near Taft, Texas, during Hurricane Harvey.[117]

[115] *Hurricane Harvey Event Analysis Report:* March *2018*, North American Electric Reliability Cooperation, page VI, March 2018, https://www.nerc.com/pa/rrm/ea/Hurricane_Harvey_EAR_DL/NERC_Hurricane_Harvey_EAR_20180309.pdf
[116] Michael Webber, "How the Texas Energy Industry Should Move Forward After Hurricane Harvey," *University of Texas – UT News*, September 17, 2017, https://energy.utexas.edu/news/how-texas-energy-industry-should-move-forward-after-hurricane-harvey
[117] Photography by Eric Grat, *Associated Press*, August 31, 2018, https://www.dallasnews.com/business/energy/2018/08/31/how-much-will-texans-pay-for-electricity-grid-damage-from-hurricane-harvey-here-s-who-decides/

2.6.5 Severe Coastal and Riverine Flooding

Texas has been described as the state of severe droughts broken by occasional severe floods. While flooding effects the majority of communities throughout Texas, several types of flooding impact different areas of the state. While there are a variety of different terms used to categorize flooding in Texas, the state generally faces three general categories: storm surge or coastal flooding, riverine flooding, and stormwater flooding.[118]

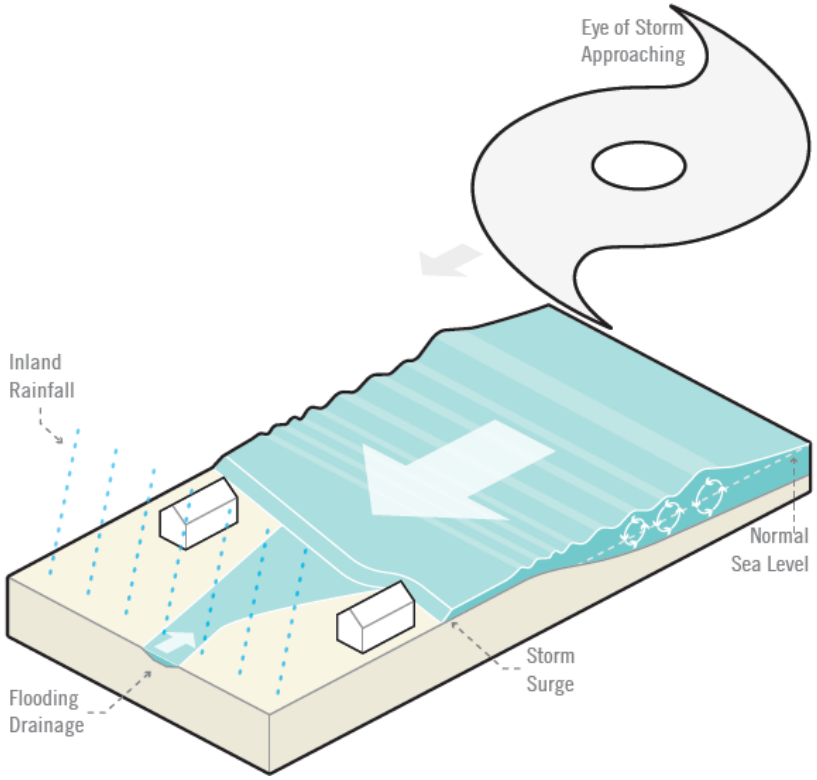
Figure 2-27: Riverine flooding along the Brazos River during the May 2015 Floods.[119]

Storm surge is an abnormal rise in water levels in coastal areas over the regular tide due to storms' winds, waves, and low atmospheric pressure. Storm surge can begin to occur a few days before a tropical system even makes landfall. Extreme coastal flooding, or the inundating of land areas along the coast, can occur particularly when storm surge occurs during the regular high tide.[120, 121] Further impacts may be seen if storm surge is combined with heavy participation creating compound flooding.[122] Compound flooding occurs when rainfall is prevented from flowing into

[118] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[119] Photography by Roy Luck, May 2015, Richmond, Texas.
[120] "Severe Weather 101- Floods," The National Severe Storms Laboratory, accessed September 26, 2019, https://www.nssl.noaa.gov/education/svrwx101/floods/types/
[121] *State Flood Assessment, Report to the Legislature, 86th Legislative Session*, TWDB, January 2019, http://www.texasfloodassessment.com/doc/State-Flood-Assessment-report-86th-Legislation.pdf
[122] Thomas Wahl, Shaleen Jain, Jens Bender, Steven Meyers, "Increasing risk of compound flooding from storm surge and rainfall for major US cities," *ResearchGate*, accessed September 20, 2019, https://www.researchgate.net/publication/282535631_Increasing_risk_of_compound_flooding_from_storm_surge_and_rainfall_for_major_US_cities

the ocean during a storm surge, furthering inland flooding, or when extreme rainfall exasperates the effects of coastal flooding.[123]

Figure 2-28: Storm Surge Explained[124]



The SHMP describes riverine flooding, also known as fluvial flooding, as flooding that comes from water which has overtaken river banks, is localized, bears immediate impacts, and is also the most widely dispersed type of flooding in Texas. From 1996-2016, riverine flooding killed and injured more people than any other weather-related hazard in the state.

The Texas Water Development Board's *State Flood Assessment* describes two types of riverine flooding—flash and slow rise flooding. Flash flooding may occur in any area where "rainfall intensity exceeds the infiltration capacity of the soil, causing rapid surface runoff," whereas slow rise flooding occurs when a rain event upstream causes flooding further downstream where it was not raining.[125]

[123] "What is Storm Surge?" Greater Houston Flood Mitigation Consortium, accessed September 26, 2019, https://www.houstonconsortium.com/p/research-studies
[124] Graphic by Greater Houston Flood Mitigation Consortium, https://www.houstonconsortium.com/
[125] http://www.twdb.texas.gov/publications/reports/special_legislative_reports/doc/State-Flood-Assessment-report-86th-Legislation.pdf?d=15025.900000007823

Stormwater flooding, or urban flooding, occurs when local water drainage systems are overwhelmed with rainwater causing flood conditions. This effect is compounded by the increased impervious surfaces, such as asphalt and concrete, found in urban areas which increase the speed and volume of stormwater runoff.[126] While this type of flooding can be seen in rural areas, urban areas—by their definition—have more roads, residences, businesses, and other uses that increase the amount of impervious surface cover and thereby increase stormwater runoff. Implementing nature-based and green infrastructure flood mitigation projects are particularly effective in combatting urban flooding, as those interventions seek to mimic the flood mitigation services found in less developed areas. In addition, ensuring responsible floodplain and wetland management, while benefitting areas facing the threat of high winds and continued sea level rise, must be practiced for flood mitigation efforts.

The SHMP forecasts that from 2018-2023 the combination of severe coastal and riverine flooding will account for $6,871,390,942 in property losses, $247,575,854 in crop losses, 103 fatalities, and 1,918 injuries.

2.6.6 FEMA's Community Lifelines for Severe Coastal and Riverine Flooding

2.6.6.1 *Safety and Security*

Risks: In addition to the risks above in the hurricane, tropical storm, and depression section, the high and often fast-moving water accompanying flooding creates the potential for first responders to be injured during rescues and the potential for government services to be delayed or government facilities to sustain damages. This is particularly true for flash flood events or flooding during night; community members may not see water at night until it enters their vehicles or may not realize how quickly flood waters have risen, necessitating search and rescue operations that also put first responders at risk.[127] Between 2005–2014, 3,256 swift water rescues were reported in 136 of Texas's 254 counties; over half of these reported rescues were in counties in the Flash Flood Alley in Texas, reaching from Dallas to San Antonio.[128]

[126] "Green Infrastructure," United States Environmental Protection Agency, accessed October 4, 2019, https://www.epa.gov/green-infrastructure/manage-flood-risk
[127] "Flood Safety," City of Austin, Watershed Protection Department, accessed October 4, 2019, http://www.austintexas.gov/department/flood-safety
[128] Vaidehi, Shah, Katie R.Kirsch, Cervantes, Diana Zane, Diana, Haywood, Tracy, and Horney, Jennifer, " Flash Flood Swift Water Rescues, Texas 2005-2014," *Climate Risk Management*, accessed October 4, 2019, https://www.sciencedirect.com/science/article/pii/S2212096316301139

Figure 2-29: Texas Army National Guard members and local first responders saving individuals in Granbury, Texas, during the 2015 Floods.[129]

Compounding this risk is potential debris in flood water that could injure the individual needing assistance or the first responders, leading to potentially more responders needing to save both injured individuals. City halls, correctional facilities, schools, community centers and other government resources can be flooded leading to school closures, city services halting, and correctional facilities damaged or needing to be evacuated.

Impacts: An increase in injuries, deaths, and closures are all potential consequences from flooding. During the 2015 flash flood along the Blanco river, a firefighter drowned after being swept away in flood waters trying to rescue individuals; in the city of San Marcos police cars washed away and a police station flooded in the same 2015 flood.[130] Two correctional facilities were evacuated during the 2016 Floods; approximately 2,600 inmates were evacuated due to a prison riot sparked by a power outage from the storm.[131] Furthermore, six people died during Hurricane Harvey when they were swept away during a boat rescue.[132]

[129] Photography by First Lt. Max Perez.
[130] Drew Harwell, "Catastrophic Flooding Hits Texas and Oklahoma," *Washington Post*, May 25, 2015, https://www.washingtonpost.com/business/economy/catastrophic-flooding-hits-texas-and-oklahoma/2015/05/25/0f86027e-02fb-11e5-a428-c984eb077d4e_story.html?noredirect=on
[131] Jon Herskovitz, "At Least 16 Killed in Texas Floods, Four Soldiers Bodies Found," *Reuters,* June 3, 2016, https://www.reuters.com/article/us-texas-flooding/at-least-16-killed-in-texas-floods-four-soldiers-bodies-found-idUSKCN0YP1OG
[132] Sebastian Jonkman, Maartje Godfroy, Antonia Sebastian, Bas Kolen, "Loss of Life During Hurricane Harvey," *Natural Hazards and Earth System Sciences*, April 19, 2018, https://www.nat-hazards-earth-syst-sci.net/18/1073/2018/nhess-18-1073-2018.pdf

2.6.6.2 *Communications*

Risks: While the SHMP does not mention the risks to communication infrastructure, flood waters have the potential to damage telephone, internet, and other communications infrastructure throughout the impacted communities, as was seen during the 2015 and 2016 Floods when cell phone and internet services were limited in areas such as the city of Wimberly.[133] These interruptions to telecommunications services can impede coordination of disaster response between first responders and emergency management coordinators, prevent those in harm's way from communicating with emergency response services, and have long-term economic impacts to residents, government, and businesses.

Impacts: The potential loss of telephone and internet services or power can limit resident's ability to seek help and for potential rescuers to find individuals in need or understand how many people need to be rescued and what their situation is. The consequences of these limitations can include injury or loss of life. Power outages were widespread during May 2015 flooding in North Texas; Dallas County saw 6,700 customers without power, while Collin, Tarrant, Denton counties saw 1,000, 1,600, and 181 customers without power respectively;[134] approximately 100,000 customers throughout Texas lost power during the 2015 floods. [135]

[133] Jamie Thompson, "When the River Rises," *Texas Monthly*, May 2016, https://features.texasmonthly.com/editorial/wimberley-floods-memorial-day-weekend-2015/

[134] Shamar Walters, Alexander Smith, and Brinley Bruton, "Texas Floods: Scores Rescued as State Struggles with Record Rain," *NBC News*, May 29, 2019, https://www.nbcnews.com/news/weather/texas-floods-dozens-rescued-state-struggles-record-rain-n366436

[135] Kristen Hays and Amanda Orr, "Storms Kill 15 in Texas, Oklahoma; Houston Flooded," *Reuters*, May 25, 2015, https://www.reuters.com/article/us-usa-storms/storms-kill-15-in-texas-oklahoma-houston-flooded-idUSKBN0OA19020150526

Figure 2-30: Laredo, Texas, during 2010 Flooding.[136]

The personal and economic loss from flooding is similar to that of hurricanes, tropical storms, and depressions, with individuals and families losing homes and communities losing businesses. During the 2015 flash floods along the Blanco river the city of Wimberly lost 350 homes.[98, 137] The June Flood of 2019 in the Rio Grande Valley destroyed 1,188 homes and FEMA's individual assistance cost are estimated at $27.6 million.[138] Further, the South Texas Floods in 2018 saw $1.9 million in approved SBA loans for businesses to repair or replace disaster-damaged property.[139]

[136] Photography by Texas Military Department.
[137] "Causes and Consequences of the 2015 South Texas Floods in Texas," University of Texas at San Antonio, January 2, 2019, https://www.sciencedaily.com/releases/2018/01/180129085801.htm
[138] "Monday Night Madness: Great June Flood II in 2019 Strikes Willacy, Eastern Hidalgo, and Northwest Cameron on June 24th," National Weather Service, accessed October 4, 2019, https://www.weather.gov/bro/2019event_june24flood
[139] "SBA Data: DR-4377 (2018 South Texas Floods). SBA TX-00500: Severe Storms and Flooding - Report 13304," Small Business Administration to GLO, August 1, 2019.

Figure 2-31: Flooded homes in Wharton during the 2016 Floods.[140]

2.6.6.3 *Food, Water, Sheltering*

Risks: Flooding—like hurricanes, tropical storms, and depressions—has the potential to close grocery stores, impair water quality, damage crops and shelters, and block evacuation routes with flood water or debris.

Grocery stores may close during flooding due to floodwater inundating stores, power outages, or major distribution centers and routes closed due to flooding. Restaurants also have the potential to close during flood events due to similar effects of flooding or if water quality becomes impaired or water is shut off completely. Crop losses not only include crops that were yet to be harvested, but losses from the delay of planting the next crops or the loss of nutrients in the soil producing lower quality crops.[141,142]

Water quality may become impaired if water treatment plants are closed due to flooding as described above in the hurricane section, or debris, soil or silt overwhelm water treatment plants. Water quality in private wells may become impaired if wells are flooded or if a septic system near the well becomes flooded.[143]

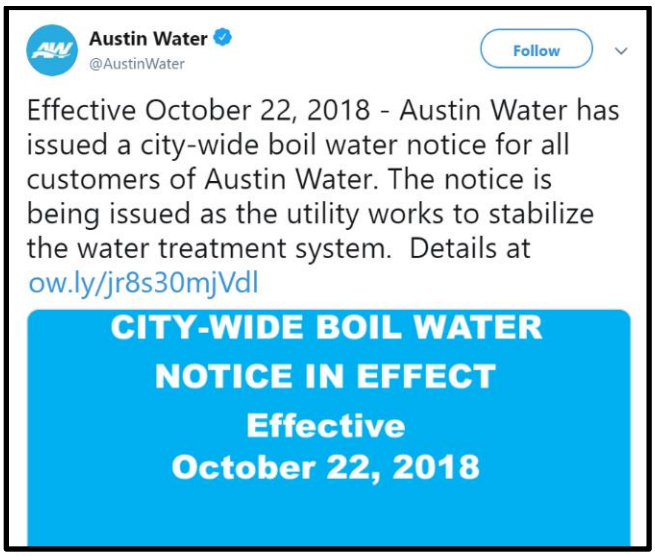
[140] Photography by 1st Lt Zachary West U.S. Army National Guard.
[141] Robert Ferris, "Texas Floods and Commodities: Farms Face 'total loss for year,'" *CNBC*, May 29, 2015, https://www.cnbc.com/2015/05/29/texas-floods-and-commodities-farms-face-total-loss-for-year.html
[142] Schnell, Ronnie, Provin, Tony, Morgan, Gaylon. "Hurricane Harvey: Assessment of Flooded Soils and Cropland in Texas," Texas A&M AgriLife Extension, accessed October 4, 2019, http://publications.tamu.edu/SOIL_CONSERVATION_NUTRIENTS/Soils_Assessment-of-HurricaneHarvey-Impact.pdf
[143] "More Free Testing Available for Private Water Well Owners Affected by Hurricane Harvey," *AgriLife Today*, December 7, 2017,

Additionally, flood waters can cause power outages at shelters not equipped with generators and flood shelters throughout the impacted areas. Floodwaters may also make it difficult for community members to reach shelters.

Impacts: During October 2018 flooding, the city of Austin experienced a boil water notice for 7 days after flooding in the Llano Rivers brought massive amounts of silt and debris into Lake Travis, the source of drinking water for the city;[144] approximately 880,000 Austin community members were impacted by this notice, [145] with approximately 40 Austin restaurants closing or having limited menu options.'[146]

Again, the consequences of not having access to shelters or crop losses can include economic losses for the community as well as increased injuries or death. There was $14 million in crop losses due to the 2018 floods in Jim Wells County alone; this not only includes direct crop losses, but damage to agricultural buildings and equipment.[147]

Figure 2-32: City of Austin Water Department Twitter account, "city-wide boil water notice," October 2018 Flooding.[148]



https://agrilifeextension.tamu.edu/blog/2017/12/07/free-testing-available-private-water-well-owners-affected-hurricane-harvey/

[144] Matt Largey, "Austin Water Lifts Boil -Water Notice," *KUT*, October 28, 2018, https://www.kut.org/post/austin-water-lifts-boil-water-notice

[145] Chase Hoffberger, "Austin Water Issues Boil Notice," *Austin Chronicle*, October 23, 2018, https://www.austinchronicle.com/daily/news/2018-10-23/austin-water-issues-boil-notice/

[146] Nadia Chaudhury, "Austin Boil Water Notice Affects Local Restaurants," *Eater Austin*, October 24, 2018, https://austin.eater.com/2018/10/22/18008626/austin-boil-water-notice-restaurants-airport-floods

[147] Texas A&M AgriLife Extension- Jim Wells County email message to GLO, August 15, 2019.

[148] "City-wide Boil Water Notice," *Twitter*, City of Austin Water Department, October 22, 2019, https://twitter.com/austinwater/status/1054279799718461440

2.6.6.4 *Transportation*

Risks: Flooding impacts have caused delays, damages, and fatalities on Texas' transportation network. The SHMP notes that almost all deaths from flash flooding occur when drivers enter low water crossings during flood events, pointing to the need for mitigation measures to be taken at these locations to protect human life. While campaigns such as the Turn Around Don't Drown campaign, developed by the Texas Flash Flood Coalition, is highly recognizable and successful in reinforcing its message, more must be done to mitigate the effects of flood related fatalities on Texas' roads. Exploring the impacts of protective barriers on roadways at low water crossings to prevent motorists from driving through moving water is one mitigation strategy that is presented in the SHMP.

Local capital improvement plans can be used to identify opportunities for public works crews to mitigate roadway infrastructure from flood damage. It is important that both inland and coastal communities identify transportation infrastructure that is vulnerable to flooding as waters may take days to dissipate and cause delays to recreation and commercial business travel. Significant roadway infrastructure may also be especially undermined and damaged along river banks, compounded by soil erosion, as Texas suffers approximately 400 floods annually.[149] These floods can be much more damaging to aging transportation infrastructure, especially infrastructure such as bridges which are often seen directly over rivers and have their integrity based in the soil which may become saturated to a point where stability comes into question. Throughout Texas, there are approximately 54,100 bridges (vehicle and non-vehicle) which represent almost 9 percent of the nation's total bridge infrastructure.[150]

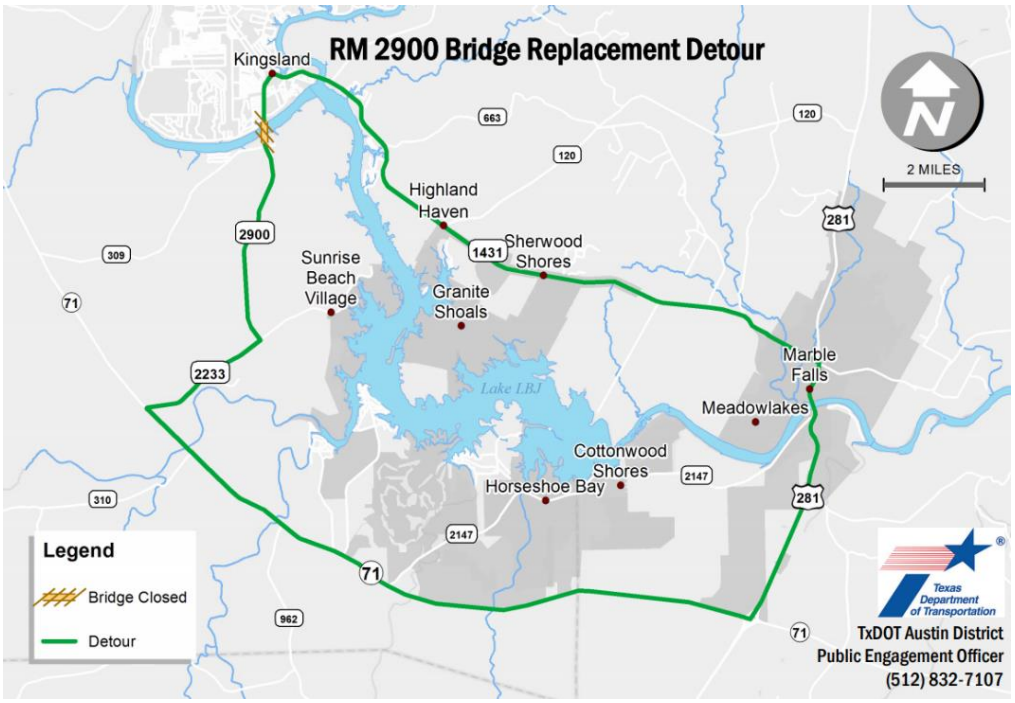
Impacts: About 75 percent of the state's flood-related deaths occur in vehicles that travel Texas roads.[151] As little as 6 inches of water can float away vehicles driving through flood waters—drivers should never attempt to cross a flooded roadway. Throughout the entire year of 2015, 25 vehicle-related flooding fatalities occurred in Texas that accounted for 22 percent of all flood-induced vehicle deaths for the United States.[152]

Further, transportation infrastructure damage caused by flooding is prevalent during such events. During the 2015 Memorial Day floods, the Fischer Store Road Bridge, located west of Wimberley

[149] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 422, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[150] "Homeland Infrastructure Foundation-Level Data (National Bridge Inventory)," United States Department of Homeland Security, accessed, October 4, 2019, https://hifld-geoplatform.opendata.arcgis.com/datasets/national-bridge-inventory-nbi-bridges
[151] "Flood Safety," City of Austin Watershed Protection Department, accessed October 4, 2019, http://www.austintexas.gov/department/flood-safety
[152] "Turn around Don't Drown," City of Houston Police Department, accessed October, 4 2019, https://www.houstontx.gov/police/pdfs/brochures/english/turn_around_dont_drown.pdf

and directly over the Blanco River, was destroyed by flood waters.[153] This 2015 flood event also saw the Blanco River overtake a portion of the heavily trafficked Interstate 35 corridor, just north of San Marcos, as all lanes remained closed until waters receded.[154] During the 2016 Flooding events, a major economic business disruption occurred due to the closure of Interstate 10 along the Texas-Louisiana border, creating lengthy delays and the loss of a major transportation corridor.[155] When, in October 2018, flood waters rose levels of the Llano River to dangerous heights not seen since 1935, dramatic footage of the RM 2900 bridge collapse in Kingsland was widely shared on social media and brought to light the dangerous power flood waters can bring to transportation infrastructure. As a result of the RM 2900 bridge collapse, local community members had to travel an additional 45 minutes to navigate the 36-mile detour. This lasted from the time of the bridge collapse in October 2018 until the bridge was rebuilt and opened for public use in May 2019.[156]

Figure 2-33: Collapsed RM 2900 Bridge Detour Map, October 2018 Llano River Flood[157]



[153] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 40, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[154] "2015 Memorial Day Weekend Flooding," National Weather Service, page 15, accessed October 4, 2019, https://www.weather.gov/media/ewx/wxevents/ewx-20150524.pdf
[155] "Floods," GLO, accessed October 4, 2019, http://www.glo.texas.gov/recovery/disasters/floods/index.html
[156] Fred Cantu, "Highland Lakes celebrate return of washed out RM 2900 Kingsland Bridge," *CBS Austin*, May 24, 2019, https://cbsaustin.com/news/local/kingsland-rm-2900-bridge-set-to-open-today
[157] "RM 2900 Bridge Replacement Detour," Texas Department of Transportation, accessed October 4, 2019, http://ftp.dot.state.tx.us/pub/txdot/get-involved/aus/rm2900/111318-detour.pdf

2.6.6.5 *Health and Medical*

Risks: Floodwaters often contain infectious organisms, including intestinal bacteria, Hepatitis A Virus, and agents of typhoid, paratyphoid, and tetanus.[158] Flooding events can cause contamination of public drinking water supplies and can lead to "boil water" notices if the drinking water has been found unsafe to consume. Food that has come into contact with floodwaters may also be unsafe to eat and may lead to health and medical concerns due to the fact that debris, sewage, oil, chemical waste, and other contaminants could have had contact with food or other items people have direct contact with. Public health concerns surrounding food and water consumption due to flooding must be followed with great care, as access to grocery stores, restaurants, and shelters may not be safe. Wildlife may be pushed to higher ground and pose a threat to the safety of humans with standing flood waters also becoming a breeding ground for mosquitoes which can then spread diseases and other potential medical concerns.

Individuals who are wading through floodwaters to either evacuate, find resources, or seek help face the potential of encountering debris which may not be visible under the water which can cause injury. Flooding can also pose health and medical risks when water infiltrates sewage facilities, as people and the environment are then also exposed to dangerous microbes and harmful bacteria.

Impacts: In April and May of 2016, 16.5 inches of rain caused the Brazos River to flood its banks, bringing flood-related devastation onto the surrounding counties. According to the Centers for Disease Control and Prevention, the floodwaters brought snakes, insects, and debris, killed six people, and led to more than 300 water rescues, hundreds of displaced persons, and the evacuation of two prisons in southeast Texas.[159] The SHMP documents that from 1996-2016, riverine flooding killed more than any other hazard during that same time period throughout Texas.[160] Therefore, medical resources and fatality management during and after flooding events must be managed and conducted respectfully and effectively.

2.6.6.6 *Hazardous Material (Management)*

Risks: Floodwaters may be contaminated by agricultural or industrial chemicals, or by hazardous materials. Flood cleanup response crews who must work near flooded industrial, chemical, waste, or polluted sites may also be exposed to hazardous materials that have contaminated the floodwater. This material may be difficult to see, as certain contaminates dissolve in water. Although different chemicals and other hazardous waste material cause different health effects, the signs and symptoms most frequently associated with hazardous material contact are headaches,

[158] "Flood Cleanup," United States Department of Labor, accessed October 4, 2019, https://www.osha.gov/OshDoc/floodCleanup.html
[159] "Flooding in Texas," Centers for Disease Control and Prevention, accessed October 4, 2019, https://www.cdc.gov/cpr/readiness/stories/tx.htm
[160] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 93, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf

skin rashes, dizziness, nausea, excitability, weakness, and fatigue.[161] Floodwaters have the strength to move and/or bury hazardous waste and chemical containers far from their normal storage places as well. Downstream locations must be aware and stay alert if an upstream hazardous material facility is inundated by floodwaters.

Impacts: Floodwaters were the main culprit of devastation during Hurricane Harvey, as the highest rainfall total amount reached 60.54 inches near Groves, adjacent to the Texas-Louisiana border. This is important to note because there are eight POL (Petroleum, Oil, and Lubricants) Pumping Stations—facilities that support the transportation of petroleum products from one location to another through transmission pipelines—within 15 miles of Groves.[162] This makes this location one of the most concentrated in the United States. If infrastructure related to these stations is damaged due to flooding, large amounts of crude oil product could leak into local communities and damage homes and businesses. The locations of hazardous material sites, specifically Superfund sites, are vulnerable to disrupting human and natural health if these sites are flooded. A Superfund site is land that is contaminated by hazardous waste and identified by the EPA as a candidate for cleanup because it poses a risk to human health or the environment. During the massive rains and flooding of Hurricane Harvey, 13 Superfund sites were flooded—11 inaccessible by response personal due to flooded roadways and limited access points to these sites.[163] The 13 sites that were affected during the flooding event of Harvey were locations that were home to industrial waste from petrochemical companies, acid compounds, solvents, and pesticides.

The U.S. Oil Recovery Superfund location, which is the site of a former processing plant for petroleum waste located in Pasadena, was reported to have three large tanks completely submerged. These tanks were used to potentially store hazardous waste and the site was contaminated with potentially deadly chemicals. It is unknown how much material leaked from the tanks.[164]

[161] "Flood Cleanup," United States Department of Labor, accessed October 4, 2019, https://www.osha.gov/OshDoc/data_Hurricane_Facts/floodcleanup.html
[162] "Homeland Infrastructure Foundation-Level Data (POL Pumping Stations)," United States Department of Homeland Security, accessed October 4, 2019, https://hifld-geoplatform.opendata.arcgis.com/datasets/pol-pumping-stations
[163] Richard Valdmanis and Timothy Gardner, "Harvey floods or damages 13 Texas Superfund sites – EPA," *Reuters*, September 2, 2017, https://www.reuters.com/article/storm-harvey-superfund/harvey-floods-or-damages-13-texas-superfund-sites-epa-idINKCN1BE03P
[164] "Mysterious, 'potentially hazardous' material removed from waste sites in Texas, but EPA won't say from where," *Dallas Morning News*, September 23, 2017, https://www.dallasnews.com/news/texas/2017/09/24/mysterious-potentially-hazardous-material-removed-from-waste-sites-in-texas-but-epa-won-t-say-from-where/

2.6.6.7 *Energy (Power & Fuel)*

Risks: Flooding events can bring wide-spread damage that can quickly impair local power grids. Floodwaters can down powerlines, limit access to gas and other fueling stations, and harm temporary power sources that are not properly protected. Overhead and underground electrical equipment can also be impacted by floodwaters. Substations, if inundated by floodwaters, often shut down to prevent major damage to high cost transformers, capacitors, switches, or other equipment. Texas has the most electric substations in the United States—4,208 electric substations in all. The next highest total California, with only 3,242.[165]

The return of electrical power after a flood can vary by flooding event and the damages caused by excess water. Restoration of power can be delayed for hours, days, or weeks depending on how long it takes the floodwaters to recede and the extent of damages. Estimating how long power may be out can also be difficult to predict if transportation corridors are impacted. Given the important of restoring power, energy providers may be inclined to come up with unique ways to restore service to their customers. From mobile substations to amphibious bucket trucks, restoration efforts must be able to adapt to the extent of each flooding event.[166]

According to the Department of Homeland Security, Texas is home to 31 oil refineries, accounting for nearly 20 percent of the nation's total; damage to these facilities during a flooding event can cause a rise in gas prices and other goods, impacting the national economy.[167]

Impacts: Due to large amounts of rain during the months of May and June of 2015, portions of East Texas succumbed to torrential flooding conditions. The waters and tributaries of the Trinity River within portions of Liberty County experienced severe flooding for several weeks. The persistent high floodwater levels led to dangerous and hazardous conditions that made it unsafe for crews with the Sam Houston Electric Cooperative to restore power to nearly 100 power meters in Liberty County that were along the Trinity River. Due to high floodwaters, restoration of power was nearly impossible from the ground. Crews had to access the flooded areas of the lower Trinity River by boat and, days later, aerial support had to be brought in to help identify if the Electric Cooperative could make further attempts to restore power back to several customers.[168]

[165] "Homeland Infrastructure Foundation-Level Data (Electric Substations)," United States Department of Homeland Security, September 2, 2019, https://hifld-geoplatform.opendata.arcgis.com/datasets/electric-substations
[166] "2017 State of the Grid," Electric Reliability Council of Texas, page 11, 2017, http://www.ercot.com/content/wcm/lists/144926/ERCOT_2017_State_of_the_Grid_Report.pdf
[167] "Homeland Infrastructure Foundation-Level Data (Oil Refineries)," United States Department of Homeland Security, accessed October 4, 2019, https://hifld-geoplatform.opendata.arcgis.com/datasets/oil-refinieries
[168] "Heavy Rains Causing Severe Flooding, Power Outages in Liberty County," Sam Houston Electric Cooperative, accessed October 4, 2019, https://www.samhouston.net/news/heavy-rains-causing-severe-flooding-power-outages-in-liberty-county

2.6.7 DROUGHT

The SHMP explains that drought is the consequence of a natural reduction in the amount of precipitation expected for a given area or region over an extended period of time, usually a season or more in length. Drought can occur anywhere in the state of Texas. Property damage from the contracting expansive soils is included in the drought-loss assessments as presented in the SHMP. The following description of drought measures comes from NOAA's National Centers for Environmental Information article, "DROUGHT: Degrees of Drought Reveal the True Picture."[169] It explains the measures of drought from the United States Drought Monitor (USDM). The USDM's drought intensity scale is composed of five different levels:

- D0: abnormally dry, corresponds to an area experiencing short-term dryness that is typical with the onset of drought. This type of dryness can slow crop growth and elevate fire risk to above average. This level also refers to areas coming out of drought, which have lingering water deficits and pastures or crops that have not fully recovered.
- D1: moderate drought, corresponds to an area where damage to crops and pastures can be expected and where fire risk is high, while stream, reservoir, or well levels are low.
- D2: severe drought, corresponds to an area where crop or pasture losses are likely, fire risk is very high, water shortages are common, and water restrictions are typically voluntary or mandated.
- D3: extreme drought, corresponds to an area where major crop and pasture losses are common, fire risk is extreme, and widespread water shortages can be expected requiring usage restrictions.
- D4: exceptional drought, corresponds to an area experiencing extraordinary and widespread crop and pasture losses, fire risk, and water shortages that result in water emergencies.

There are generally four main types of drought: Meteorological, Agricultural, Hydrological, and Socioeconomic. The Texas Water Development Board provides a description of each:

- Meteorological drought—begins with a period of abnormally dry weather resulting in less than the long-term average rainfall for that period. It does not necessarily impact water supply.
- Agricultural drought—often follows or coincides with meteorological drought and can appear suddenly and cause rapid impacts to agriculture. It reduces soil moisture,

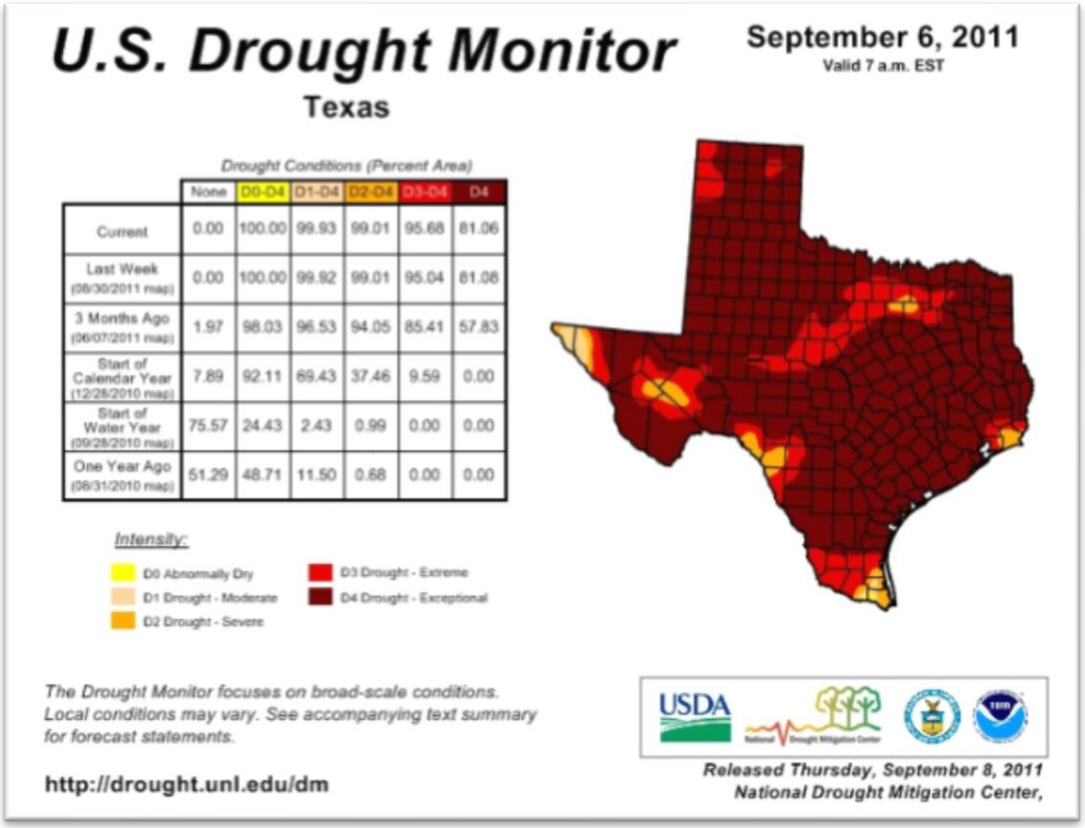
[169] "DROUGHT: Degrees of Drought Reveal the True Picture," NOAA, accessed October 4, 2019, https://www.ncdc.noaa.gov/news/drought-degrees-drought-reveal-true-picture

which decreases crop or range production, and increases irrigation demands. It often leads to drought disaster declarations and in many cases is an indicator of an impending hydrological drought.

- Hydrological drought—a period of below-average streamflow and water volume in aquifers and reservoirs, resulting in reduced water supplies.
- Socioeconomic drought—occurs when physical water needs affect the health, safety, and quality of life of the general public or when the drought affects the supply and demand of an economic product.[170]

At the peak of the 2011 drought, a little over 80 percent of Texas was under D4 drought severity, as seen in the following figure and attributed to the USDM.

Figure 2-34: September 6, 2011, U.S. Drought Monitor[171]



[170] *Chapter 3- Water for Texas 2017 State Water Plan Texas Water Development Board*, Texas Water Development Board, page 32, accessed October 4, 2019, https://www.twdb.texas.gov/waterplanning/swp/2017/chapters/03-SWP17-DROUGHT.pdf

[171] "Wild Facts About the Texas Drought," *Live Science*, September 9, 2011, https://www.livescience.com/15990-texas-drought-wildfire-facts.html

2.6.8 FEMA's Community Lifelines for Drought

2.6.8.1 *Safety and Security*

Risks: Droughts pose a unique challenge to first responders and government services. Unlike risks associated with flooding or hurricanes, tropical storms or depressions, the effects of droughts can occur over a significant period of time and may go unnoticed until there is obvious damage. Droughts have the potential to cause foundations to fracture; local governments, especially smaller or more rural communities, may face a significant financial investment when city halls' or critical government buildings' foundations crack—this is also true for local homes and businesses. If communities do not have the funds to fix these structural issues this may lead to further damage over time such as cracked water pipes or damaged heating and air conditioning systems. Additionally, the SHMP speaks to dust storms that may accompany prolonged droughts.[172] This may lead to first responders unable to travel to impacted areas due to dangerous travel conditions with limited visibility.

Impacts: The potential for damage to government buildings from cracked foundations, and the potential for first responders to not reach individuals in need may lead to the consequences of increased injury or loss of life, and financial losses. In 2012 a dust storm, or a haboob, engulfed much of the South Plains, resulting in limited to zero visibility in the impacted areas. These conditions led to a 25-vehicle pileup with 1 fatality and at least 17 individuals sustaining injuries.[173]

2.6.8.2 *Communications*

Risks: Limited visibility associated with dust storms accompanying droughts limit not only local officials' ability to assess current conditions or reach community members in need, but also community members ability to understand what situation they are in. Droughts are also often accompanied by high heat. High heat and drought could lead to power outages throughout the impacted community creating the potential for individuals to lose access to the telephone, internet service, or power.[174]

Droughts have the potential to cause substantial economic losses particularly in the agricultural industry through a lack of available water for irrigation and supplying livestock. This impacts a variety of crops such as rice that depend on large releases of water from the lower Colorado River, as well as less water-intensive crops such as corn and cotton.

[172] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 37, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[173] "NWS Lubbock, TX, December 19th high winds and dust storm," National Weather Service, NOAA, https://www.weather.gov/lub/events-2012-20121219-dust
[174] "Incident Action Checklist–Drought," Office of Water, United States Environmental Protection Agency, January 2015, https://www.epa.gov/sites/production/files/2015-06/documents/drought_0.pdf

In addition to the immense agricultural risk, homes and businesses are at risk as well. Home and business foundations may crack during drought and are susceptible to the risks of wildfires. A variety of businesses also rely on water to function. Local restaurants may need to close due to the lack of water necessary for cooking or preparing food.

Impacts: The consequences to individuals or first responders losing internet or telephone capabilities, or community members' inability to reach safety, include injuries, death, and financial loss. The 2011 drought in Texas accounted for more than $7.6 billion in agricultural losses.[175] This number includes $3.23 billion in livestock losses, $750 million in lost hay, $2.2 billion in cotton crop loss, $736 million in corn crop loss, $314 million in wheat crop loss, and $385 million in sorghum crop loss.[176] A specific example of the agricultural impacts during the 2011 drought is the effect on rice farmers. During the drought, rice farmers could not get enough water because they depend on reservoirs that became dry and then officials made the decision to not release irrigation water to rice farmers.[177] This led to not only crop losses for 2011, but in future years as well. In 2011, Matagorda County planted about 22,000 acres of rice. But without water in 2012, that number fell to 2,100 acres.[59] Further, approximately 3,000 homes were damaged due to the 2011 drought.[178]

2.6.8.3 *Food, Water, Sheltering*

*Risk*s: Prolonged drought conditions have the potential to stretch already limited water sources throughout the state to irrigate crops or provide water to livestock. Identical to the risks in the Communications lifeline above, limited water supplies can lead to a loss of current and future crop production, loss of revenue for industries associated with agriculture production, and increased mental health issues for farmers who are impacted by drought.

A lack of water is the crucial issue associated with droughts. During extreme or prolonged droughts entire communities may run out of water for drinking, irrigation, and all other uses. Water quality may also degrade due to drought—the high temperatures associated with drought may lower levels of dissolved oxygen in waterways harming fish and other aquatic animals that contribute to the health of local streams and water ways. Additionally, as droughts persist, coastal aquifers that are

[175] Blair Fannin, "Updated 2011 Texas Agricultural Drought Losses Total $7.62 billion," *AgriLife Today*, Texas A&M AgriLife, March 21, 2012, https://today.agrilife.org/2012/03/21/updated-2011-texas-agricultural-drought-losses-total-7-62-billion/
[176] Terrence Henry, "Agricultural Losses from Drought Top $7 Billion," *State Impact, NPR*, March 21, 2012, https://stateimpact.npr.org/texas/2012/03/21/agricultural-losses-from-drought-top-7-billion/
[177] Nathan Koppel, "Texas Rice Farmers Lose Their Water," *Wall Street Journal*, March 2, 2012, https://www.wsj.com/articles/SB10001424052970204571404577257663909299488
[178]Chris Amico, Danny DeBelius, Terrence Henry, and Matt Stiles, "State Impact Texas Drought," *NPR*, accessed October 2, 2019, https://stateimpact.npr.org/texas/drought/

relied on for drinking water and irrigation do not recharge as fast leading to infiltration of salt water into those freshwater supplies.[179]

Figure 2-35: The Blanco River during the 2011 drought. The Blanco River supplies water to nearby communities and ranches.[180]

Drought conditions pose a significant risk to agriculture throughout the state of Texas and test the structural integrity of shelters. Similar to damage that city halls or other buildings may sustain, there is the potential for foundations to crack or for shelters to sustain other structural damage due to drought conditions. This not only poses a financial risk to local communities but may also lead to heat and water systems failing or malfunctioning during other hazards such as during an extreme heat event.

Impacts: A loss of water, crops, and shelters can lead to financial consequences and an increase in injuries and loss of life. During the 2011-2014 drought a number of communities were almost completely out of water. Public entities are required to report to the Texas Commission on Environmental Quality (TCEQ) if they think that their community will run out of water in the next 180 days. During the 2011–2014 drought, there were over 110 public water systems on the 180-

[179]"Texas Aquifers," Texas Water Development Board, accessed October 4, 2019, http://www.twdb.texas.gov/groundwater/aquifer/index.asp
[180] Photo by Earl McGehee, Blanco County, Texas.

day list. The highest number of public water systems on the 180-day list at one time was 58 (November 2014 and February 2015).[186]

The SHMP states that drought or abnormal dryness is forecasted to cause at least $3.86 billion in crop losses with $3.1 billion of these losses in the Texas Panhandle.[181] In looking at past events, such as the 2011 drought in Texas that led to over $7 billion just in agricultural losses, this projected number is conservative.

If a prolonged drought is accompanied by extreme heat, community members may need to seek shelter; however, drought conditions can damage air conditioning systems or a shelter's foundation, leading to the closure of the shelter and reduction in sheltering options. The consequences of limited shelters may be increased injuries or deaths if community members have no or limited options to seek shelter from the heat or other hazard.

Figure 2-36: Texas corn crops during 2013 severe drought conditions.[182]

[181] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 5, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[182] Photo by Bob Nichols, United States Department of Agriculture.

2.6.8.4 *Transportation*

Risks: Drought conditions have a limited effect on port and waterway transportation operations along the Texas coast, but can affect ground commercial and recreational transportation throughout the state. Drought can cause the contraction and expansion of surface pavement, road beds, and buried utilities along Texas roads that may be damaged more easily by the use of heavy vehicle traffic in urban and suburban areas.[183] If transportation-related infrastructure such as pavements and other surface materials are in unsuitable conditions due to the contraction and expansion of soil and infrastructure-related elements caused by drought, such infrastructure may not be safe for travel or use without causing damage to vehicles or by putting people in danger. The SHMP notes that when bridges, highways, streets, and parking lots are built on expansive soils such as clay, they are especially vulnerable to damage during drought conditions.

Impacts: While areas throughout Texas are impacted by expansive soils, these areas are usually scarcely populated while others, especially those along the Interstate 35 Corridor, contain some of the fastest-growing and most populated jurisdictions in Texas. The SHMP notes that the cities of Austin and Dallas were among the top 10 in the country with the largest population growth; both are located along Interstate 35. The smaller cities of New Braunfels and Georgetown, and Frisco near Dallas, are listed among the top 10 fastest-growing smaller cities in the same report.[184] To accommodate this growth, roadway systems must be built on vulnerable soil conditions at high risk during severe droughts.

2.6.8.5 *Health and Medical*

Risks: If, due to drought conditions, water utilities are either challenged or unavailable to deliver sufficient service and clean water to hospitals and other medical providers, loss of life could be a consequence. Broad-based healthcare emergency services such as firefighting, nursing, rehabilitation clinics, and other forms of health and medical services rely on water for systems that support patient care and general building and facility operations. Further examples that rely on the availability of water are water-based treatments, fire suppression, and the decontamination of potential biomedical hazardous materials. Costly, and potentially dangerous, patient movement may be required if a drought-stricken area is not able to provide water to local healthcare and medical facilities. Drought has also been known to cause a rise in public health advisories, as dust

[183] *Central Texas Extreme Weather and Climate Change Vulnerability Assessment of Regional Transportation Infrastructure*, City of Austin and Capitol Area Metropolitan Planning Organization, January 2015, https://austintexas.gov/sites/default/files/files/CAMPO_Extreme_Weather_Vulnerability_Assessment_FINAL.pdf
[184] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 249, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf

clouds caused by a lack of rain can cause an illness known as "dust pneumonia" and other respiratory illness due to bad air quality.[185]

Impacts: In arid regions of Texas, such as the Panhandle and the western portion of the state, drought conditions can have a large effect on the health of the population. Lung and respiratory illnesses increase as air quality suffers, with particulate matter able to travel more easily which can irritate the throat and lungs while making breathing difficult, especially to those with asthma. According to the Environmental Defense Fund, over 2 million people in Texas have asthma, including every 1 in 13 adults and every 1 in 11 children.[186]

2.6.8.6 *Hazardous Material (Management)*

Risks: The United States Department of Homeland Security notes that "Food, paper, chemicals, refined petroleum, and primary metal manufacturers all use large amounts of water."[187] Throughout the production process of these materials, waste is generated and must be both handled and disposed of in a safe and legal manner. If drought has limited the ability for the production of specific products to be created, hazardous waste produced by such forms of industrial production may not be able to be handled and or cleaned in the most efficient way possible. If a drought-stricken area has hazardous particulate matter on the surface of the ground, from an industrial or natural event, a lack of rain could allow winds to pick up and move these particulates over a more widespread area.[188]

Impacts: The driest recorded year in Texas was 2011. During this time, drought devastated the state causing shortages in drinking water, and both economic and agricultural losses. The 2011 drought also caused considerable damage to infrastructure including sewer lines, roads, and other transport mediums that carry hazardous waste and hazmat material.[189] While no leaks or spills were reported as a result of the 2011 drought, there was a heightened risk of hazardous material outflow into our environmental systems.

[185] "Drought Impacts to Critical Infrastructure," United States Department of Homeland Security, page 10, April 30, 2015, https://content.govdelivery.com/attachments/USDHSFACIR/2015/04/30/file_attachments/386534/Drought+Impacts+to+Critical+Infrastructure.pdf
[186] "Asthma in Texas," Environmental Defense Fund, August 1, 2016, http://blogs.edf.org/texascleanairmatters/2016/08/01/asthma-in-texas/
[187] "Drought Impacts to Critical Infrastructure," United States Department of Homeland Security, page 10, April 30, 2015, https://content.govdelivery.com/attachments/USDHSFACIR/2015/04/30/file_attachments/386534/Drought+Impacts+to+Critical+Infrastructure.pdf
[188] Ibid.
[189] Behni Bolhassani, "The 2011 Texas Drought: Its Impacts and Implications," *Texas Water Policy*, January 23, 2015, http://www.texaswaterpolicy.com/blog/2015/1/23/the-2011-texas-drought-its-impacts-and-implications

2.6.8.7 *Energy (Power & Fuel)*

Risks: The availability of water is a key component for the operations of power plants and energy production systems throughout Texas. Droughts can impact all forms of energy production, as water is required throughout the production process, from cooling to cleaning, to generating steam. Water is also essential in cultivating crop resources for biofuels, turbine power, and the extraction of raw materials to fuel production of multiple energy forms.[190] Because of the interconnection of water availability and the production of power, droughts can lead to blackouts and brownouts that can affect a wide range of critical functions.

Impacts: The United States Department of Energy's Argonne National Laboratory noted in a study that severe drought could lead to the Texas Gulf Coast Basin losing 25 percent of its energy production.[191] This is due to that region's dependence on water for the cooling of local fossil-fuel resourced power plants. A severe drought could lead to power failures, gas shortages, and critical support function deficiencies; it would also place an economic burden on the state and especially those Gulf Coast communities that support these plants and are home to their staff.

[190] "Drought Impacts to Critical Infrastructure," United States Department of Homeland Security, page 8, April 30, 2015, https://content.govdelivery.com/attachments/USDHSFACIR/2015/04/30/file_attachments/386534/Drought+Impacts+to+Critical+Infrastructure.pdf

[191] C.B. Harto, Y.E. Yan, Y.K. Demissie, D. Elcock, V.C. Tidwell, K. Hallett, J, Machnick, and M.S. Wigmosta, *Analysis of Drought Impacts on Electricity Production in the Western and Texas Interconnections of the United States*, Argonne National Laboratory, December 2011, https://www.osti.gov/biblio/1035461-analysis-drought-impacts-electricity-production-western-texas-interconnections-united-states

2.6.9 HAILSTORMS

According to the SHMP, hailstorms can happen anywhere throughout Texas. Being a form of solid precipitation, hail consists of balls or irregular lumps of ice, each of which is called a hailstone. Hailstones usually measure between 5 millimeters (0.2 inches) and 15 centimeters (6 inches) in diameter and are generally associated with thunderstorms. Hail formation requires environments of strong, upward motion of air, like tornadoes, and freezing temperatures at lower altitudes. In the mid-latitudes, hail forms near the interiors of continents; in the tropics, it tends to be confined to high elevations.

Figure 2-37: Hail Sizes by Inches[192]

Estimating Size of Hail	
Pea	0.25 inch
Penny or Dime	0.75 inch
Quarter	1.00 inch
Half Dollar	1.25 inches
Golf Ball	1.75 inches
Tennis Ball	2.50 inches
Baseball	2.75 inches
Grapefruit	4.00 inches

As described in the SHMP, hailstones form by colliding with supercooled water drops. Supercooled water will freeze on contact with ice crystals, frozen raindrops, dust, or some other nuclei. The storm's updraft then blows the forming hailstones up the cloud. As the hailstone ascends, it passes into areas of the cloud where the concentration of humidity and supercooled water droplets varies. When the hailstone moves into an area with a high concentration of water

[192] "Estimating Hail Size," National Weather Service, NOAA, accessed October 4, 2019, https://www.weather.gov/boi/hailsize

droplets, it captures the latter and acquires a translucent layer. Should the hailstone move into an area where mostly water vapor is available, it acquires a layer of opaque white ice.

The hailstone will keep rising in the thunderstorm until its mass can no longer be supported by the updraft; it then falls toward the ground while continuing to grow, based on the same processes, until it leaves the cloud. It will later begin to melt as it passes into air that is an above-freezing temperature.[193] The SHMP notes that from 2018–2023, it is forecasted that hailstorm events will account for $2,521,001,724 in property losses, $166,637,326 in crop losses, 1 fatality, and 35 injuries.

2.6.10 FEMA's Community Lifelines for Hailstorms

2.6.10.1 *Safety and Security*

Risks: Hailstorms have the potential to shatter windows, damage roofs, limit visibility, and leave debris in the right of way. These may cause first responders to take longer to reach community members in need or prevent responders reaching individuals in an impacted area altogether. In addition, these effects may damage government buildings leading to a financial loss for communities, a delay in government services, or delay school start times.

Impacts: While there have been no reported deaths in Texas due to hail in the last 19 years, in 2000 an individual was struck and killed by hail in Fort Worth while he was trying to reach shelter during a severe thunderstorm.[194]

2.6.10.2 *Communications*

Risks: Similar to flooding, droughts, hurricanes, tropical storms, and depressions, hailstorms have the potential to damage critical infrastructure such as powerlines, internet and telephone infrastructure. The loss of communication infrastructure has several potential risks, including: increased response time for first responders to reach those in need; preventing individuals in need for calling for help; and a halt or delay in normal business operations.

Hail may damage vehicles and homes, creating a potential additional financial and economic loss for individuals and employers throughout an impacted community. In addition to damages to vehicles, homes and businesses can suffer significant damages; hail can break windows and damage roofs.

[193] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 127, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[194] Joe Pappalardo, "Wind," *Dallas Observer*, April 13, 2000, https://www.dallasobserver.com/news/ill-wind-6395809

Impacts: The SHMP describes a series of tornadoes in Dallas County in 2012 that were accompanied by severe hail; approximately 29 people were injured during this event.[195] A hailstorm in North Texas in 2018 generated approximately $1.4 billion in economic losses.[196] In 2017, Texas ranked number one for total property loss from hail, including residences, at 1.3 million properties impacted.[197]

Figure 2-38: East Dallas neighborhood during June 2012 hailstorm.

These examples provide a glimpse into the wide-reaching economic impacts of hailstorms. The potential for delayed response from first responders or community members not able to call for help may increase the likelihood of injuries or deaths, particularly when hailstorms are accompanied by severe thunderstorms, tornadoes, or flooding.

2.6.10.3 *Food, Water, Sheltering*

Risks: Hailstorms often accompany severe thunderstorms and tornadoes; the combination of potential flooding, high winds, and impact from large hail can lead to crop damages, a lack of sheltering options and the inability to reach shelters. Hailstorms not only bring the need for shelter for people, but for all types of personal and public vehicles. For individuals lacking a covered

[195] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 40, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[196] "U.S. Billion Dollar Weather and Climate Disasters 1980-2019," NOAA, accessed October 2, 2019, https://www.ncdc.noaa.gov/billions/events.pdf
[197] "Top States for Home Hail Damage," *Insurance Journal*, June 20, 2019, https://www.insurance.com/coverage/home-hail-damage-insurance-claims

parking area, there is an additional concern over where to keep their vehicle during a hailstorm, and the potential for increased accidents if vehicles are on the road during a hailstorm. Police vehicles, school buses and ambulances may not have a sheltered parking area; this may lead to significant damage and to delays in public services.

Impacts: The consequences of individuals trying to quickly find shelter during a hail storm may lead to increased accidents and an increase in injuries and financial losses for residents in impacted areas. Damage to public vehicles including ambulances, police vehicles, school busses and other local, state, or federal vehicles due to limited shelters, can delay public services, school start times, and response time for first responders leading to more accidents. In 2017 the Little Elm school district had 35 out of 48 school busses severely damaged by large hail; this led to a delay in children getting to school on time.[198]

2.6.10.4 *Transportation*

Risks: Hailstorms can cause direct damage to vehicles and transportation infrastructure. Personal vehicles are vulnerable to window and mirror damage while safety features such as cameras can also be impaired. The SHMP notes that when hail breaks the windows of personal vehicles, water damage from accompanying rains can render a vehicle unsalvageable.[199] This level of damage can affect all modes of transportation including ground, aerial, and water modes. Hailstorms can also impair visibility and force the operators of vehicles to experience unsafe driving conditions. Depending on the size of the hail associated with a hailstorm, signage and other transportation support systems can be damaged. The functionality of traffic signals, such as traffic lights and pedestrian beacons, can be compromised or rendered unusable, with immediate repair not being an option due to human safety risks of crews during such a weather event.

Impacts: According to the National Insurance Crime Bureau (NICB), Texans filed the most hail damage insurance claims out of any other state. From January 1, 2016, to December 31, 2018, there were 2.9 million claims filed nationally because of hail; Texas accounted for more than 811,000 of these claims, most coming from damaged vehicles.[200] The SHMP spotlights a hailstorm event at the Dallas-Fort Worth International Airport that damaged 110 airplanes on April 3, 2012.[201]

[198] Jennifer Lindgern, "Most Little Elm ISD School Buses Damaged by Hail," *CBS News DFW*, March 27, 2017, https://dfw.cbslocal.com/2017/03/27/most-little-elm-isd-school-buses-damaged-by-hail/
[199] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 128, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[200] "Once Again, Texas Tops National with Most Hail Damage Insurance Claims," *CBS News DFW*, August 6, 2019, https://dfw.cbslocal.com/2019/08/06/texas-tops-nation-hail-damage-insurance/
[201] Terry Maxon, "D/FW Airport says more than 110 airplanes there received hail damage," *Dallas Morning News*, April 3, 2012, https://www.dallasnews.com/business/airlines/2012/04/03/d-fw-airport-says-more-than-110-airplanes-there-received-hail-damage/

Figure 2-39: Hail damage after a March 2019 storm in the DFW area.[202]

2.6.10.5 *Health and Medical*

Risks: Hailstorms can bring widespread damage to infrastructure and personal property that may affect medical facilities and medical transport units. Further, due to its varying size, hail can pose a serious risk, sometimes fatal, to human health and safety. Hailstorms can be particularly dangerous for drivers, as operating a vehicle that is being hit by hail is extremely hazardous. During a hailstorm, first responders arrival time may be impeded due to weather conditions and the risk to their own lives. Windows can break and shatter glass throughout a dwelling. Roofs can become punctured and structural failures may occur, as well as water leaks. Individuals caught outside by a hailstorm are at risk of being pelted by hail that can produce lesions, contusions, and other bodily harm that may require medical attention.

Impacts: On May 5, 1995, hailstorms ravaged the Dallas-Fort Worth metroplex. Hail measuring the size of softballs interrupted a local outdoor event called Mayfest. Over 100,000 people were in attendance and were all caught outside when hail began to fall. More than 400 people were injured, 60 seriously, during this extreme weather event.[203]

[202] Photograph by WFAA Dallas-Fort Worth, March 25, 2019, https://www.wfaa.com/gallery/news/local/hail-during-sunday-storm-creates-damage-to-cars-roofs-in-north-texas/287-ff521afe-182a-4ca1-ab53-9359450ef2e9

[203] Ashley Williams, "What are your chances of being killed by hail in the US?" *AccuWeather*, July 23, 2019, https://www.accuweather.com/en/weather-news/what-are-your-chances-of-being-killed-by-hail-in-the-us/70007838

2.6.10.6 *Hazardous Material (Management)*

Risks: Hail has the ability to penetrate protective structures and shelters, leading to high levels of property loss. This destructive capacity is illustrated in the SHMP property loss forecast for hail in Texas from 2019–2023 that estimated $2.52 billion in property losses, the third highest property loss forecast behind severe coastal flooding and hurricanes, tropical storms, and depressions.[204] The potential for property damage from hail can also have a serious impact on the storage of hazardous materials. If hazardous material storage facilities are damaged and/or penetrated by large hail, leaks and other ruptures may occur and allow hazardous materials to spill out. In homes, large hail can damage ventilation caps on chimneys, furnaces, hot water heaters, etc., potentially exposing individuals to carbon monoxide and other hazardous gases.

Impacts: The SHMP notes that statewide from 1996–2016, Dallas County had the highest damage value impact caused by hailstorms. In the county, there are 23 Toxic Substances Control Act (TSCA) facilities, roughly 500 Toxic Release Inventory (TRI) facilities, and 12 solid waste facilities.[205] Based on their location, these facilities are susceptible to hailstorm damage that could create leaks of material that may be hazardous to environmental and human health.

2.6.10.7 *Energy (Power & Fuel)*

Risks: Hailstorms are associated with powerful thunderstorms that bring high winds that can damage structures, heavy rains that bring the potential for flash flooding, and lightning strikes that carry the risk of electrocution. Because of this, it is difficult to track the degrees to which hail is solely responsible for power outages or other damage to an electric grid or fuel supply. However, hail can complicate the restoration of power to an area due to unforeseen damages to restoration vehicles, protective structures, or energy grid infrastructure itself. Any energy-related infrastructure that is outside and in the open has the risk of being damage or destroyed by hail, as the rate of speed that hail falls depends on the size of the hail itself. Marble-sized hail can fall at speeds around 20 mph, while hail the size of a baseball can exceed 100 mph.[206]

Impacts: On April 19, 2015, a surprise storm produced 2-inch hailstones (between the size of a golf ball and tennis ball) in Tomball. During this event, motorists had to take shelter under the covering of a local gas and fueling station.[207] In the image below, solar panels appear to be damaged by hail stones. This hailstorm event took place in the DFW Metroplex, near Wylie, and

[204] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 4, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[205] "Homeland Infrastructure Foundation-Level Data (Chemicals)," United States Department of Homeland Security, accessed September 18, 2019, https://hifld-geoplatform.opendata.arcgis.com/search?groupIds=ab41b78984f7434b9f0b78f2462f6f7d
[206] Tom Steele, "How fast hail falls, and other cold, hard facts," *Dallas Morning News*, April 12, 2016, https://www.dallasnews.com/news/2016/04/12/how-fast-hail-falls-and-other-cold-hard-facts/
[207] Angela Chen, "Hail storm across Houston area caught many by surprise," *ABC13 Eyewitness News*, April 20, 2015, https://abc13.com/news/several-parts-of-southeast-texas-hit-with-hail/671187/

damaged homes, personal vehicles, and energy production sources such as the solar panels that were fixed atop of this particular house.

Figure 2-40: Hail damage to residential solar panels.[208]

[208] "Hail Storm Slams Northern Texas," National Insurance Crime Bureau, accessed October 2, 2019, https://www.nicb.org/news/blog/hail-storm-slams-northern-texas

2.6.11 TORNADOES

From 1955-2015, Texas experienced 8,500 tornado events, roughly 14 percent of all tornadic activity that occurred in the United States during this period.[209] The SHMP notes that tornadoes are not distributed equally across Texas but occur annually and are frequent in the northern two-thirds of Texas. The average annual dollar loss in Texas due to tornadoes is $108,896,168.[210] The SHMP notes that from 2018-2023, it is forecasted that tornadoes will account for $650,692,305 in property losses, $23,115,327 in crop losses, 22 fatalities, and 382 injuries. Tornado mitigation efforts need to consider the use of safe rooms and enhanced wind engineering/construction techniques. According to FEMA, tornadoes are assigned a classification based on estimated wind speeds and related damage. The National Weather Service implemented the "Enhanced Fujita Scale," or E-F Scale, in 2007 to classify tornadoes more consistently and accurately. Tornadoes with higher EF classifications produce stronger winds and cause more damage.[211]

Table 2-6: Enhanced Fujita Scale with Expected Damages

Enhanced Fujita Scale with Potential Damages		
Category	Wind Gusts	Potential Damage
EF0	65 – 85 mph	Damage includes loss of roof-covering material (<20%), gutters, and/or awnings; loss of vinyl or metal siding; tree branches broken; and shallow-rooted trees toppled.
EF1	86 – 110 mph	Damage includes broken glass in doors and windows; uplifted roof decks and significant loss of roof covering (>20%); collapse of chimneys and garage doors; mobile homes pushed off foundations or overturned; and moving automobiles pushed off roads.
EF2	111 – 135 mph	Damage includes entire houses shifted off foundations; large sections of roof structures removed; mobile homes demolished; trains overturned; large trees snapped or uprooted; and cars lifted off ground and thrown.
EF3	136 – 165 mph	Damage includes collapse of most walls except small interior rooms; and most trees in forest uprooted.
EF4	166 – 200 mph	Damage includes well-constructed houses leveled; structures blown off weak foundations; and cars and other large objects thrown.

[209] "Homeland Infrastructure Foundation-Level Data," U.S. Department of Homeland Security, accessed October 5, 2019, https://hifld-geoplatform.opendata.arcgis.com/datasets/historical-tornado-tracks
[210] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 91, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[211] "Lesson 17 Overview: Tornado Hazard," Federal Emergency Management Agency, https://emilms.fema.gov/IS0277A/groups/1932.html

EF5	>200 mph	Damage includes strong frame houses lifted off foundations, carried a considerable distance, and disintegrated; automobile-sized missiles flown through the air in excess of 100 meters; trees debarked; and slabs swept clean.

2.6.12 FEMA's Community Lifelines for Tornadoes

2.6.12.1 *Safety and Security*

Risks: The SHMP describes tornadoes as unpredictable and sudden hazards.[212] This creates uncertainty for response teams as well as local, state, and federal officials in the impacted areas, and requiring a variety of first responder specialties. During the May 2019 extreme weather alert that included possible tornadoes across the state, eight state agencies were involved in response, providing first-responder resources such as Ambulance Strike Teams, Type 1 Mobile Medical Units, and AMBUSes.[213]

Tornadoes often occur along with hurricanes, hail, and severe thunderstorms. These accompanying hazards may bring high water, sever hail, or lightning, compounding their potential damage. Tornadoes occurring during hurricanes are often weaker, yet more unpredictable.[214] This leads to challenges for first responders conducting search and rescue as the threat of tornadoes increases the chance of injury or death. Heavy winds from tornadoes can fling debris, with the potential to damage roofs, windows or electrical systems leading to increased water damage or power outages at government facilities during a flood or hurricane event.

Impacts: With the variety of first responders needed, there is a greater chance for first responders to be injured especially during several hazards occurring at the same time. First responders may also be injured or prevented from reaching those in need because of potential debris in roadways leading to additional injuries or deaths.

Furthermore, damage to roofs, windows, electrical systems or other structural damage may lead to a financial loss for local, state or federal governments as well as a delay in public services. During the weekend of April 13, 2019, Franklin, Texas saw a vast amount of damage from these tornadoes

[212] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 167, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[213] "Governor Abbott Prepares State Resources as Severe Weather and Tornadoes Approach Texas," Office of the Texas Governor, May 20, 2019, https://gov.texas.gov/news/post/governor-abbott-prepares-state-resources-as-severe-weather-and-tornadoes-approach-texas
[214] "Hurricane Annex: State of Texas Emergency Management Plan," Texas Division of Emergency Management, Texas Department of Public Safety, May 2017, https://www.preparingtexas.org/Resources/documents/State%20and%20Fed%20Plans/2017_12_14_Hurricane_Annex.pdf

with much of the southside of the town destroyed—including a housing authority, homes, and local businesses. During this same tornado event, debris blocked roadways preventing first responders from reaching impacted areas.[215]

2.6.12.2 *Communications*

Risks: Similar to the risks associated with hurricanes, the variety of first responders needed for a tornado event especially when tornadoes are expected along with other hazards, brings a variety of different communication protocols and equipment. This may lead to miscommunication and confusion over responders' roles during a tornado. The unpredictability and suddenness of tornadoes may contribute to this miscommunication or confusion; first responders, community members, or local, state, or federal officials may think and state that a tornado is headed in a particular direction, but then the tornado changes course.

The heavy winds and flying debris during a tornado may damage power lines or cut off telephone or internet service, preventing those in need from getting help. During the severe thunderstorms and tornadoes throughout Texas in August 2019, 75,000 power outages were reported throughout the state.[87]

Texas communities differ in their use of tornado sirens. Dallas uses tornado sirens, whereas other communities such as San Angelo and Houston do not. Houston sends out mass alerts similar to Amber Alerts where community members sign up to receive messages.[216] This may lead to several issues. First, communities with sirens have seen residents confused over what to do when they hear the warning; communities are stressing to their residents that these sirens are not necessarily tornado specific and mean to find shelter as soon as possible. Second, communities with messaging systems rather than sirens run the risk of residents not knowing how to sign up for the service or not understanding that they need to sign up to receive the service.[217] Third, communities without tornado sirens may instead encourage residents to watch the news, listen to the radio, or receive information through another mass medium; however, residents may not have access to the radio, broadcast news, or other media—particularly during power outages.[218] Compounding these

[215] Amanda Schmidt, Kevin Byrne, "2 young brothers among 9 killed in destructive tornado outbreak across southern, mid-Atlantic US," *Accuweather*, September 4, 2019, https://www.accuweather.com/en/weather-news/live-deadly-tornado-kills-2-children-leaves-trail-of-horrific-damage-in-texas/70007983

[216] Jesus Jimenez, "Why don't some Texas cities have outdoor warning sirens? Curious Texas investigates," *Dallas Morning News*, February 7, 2019, https://www.dallasnews.com/news/curious-texas/2019/02/07/why-don-t-some-texas-cities-have-outdoor-warning-sirens-curious-texas-investigates/

[217] Bill Hanna, "Severe Storms May Cause Sirens to Sound Wednesday, Do You Understand What That Means?" *Fort Worth Star-Telegram*, April 17, 2019, https://www.star-telegram.com/news/local/fort-worth/article229286689.html

[218] Matt Tramell, "WATCH: Why Tornado Sirens Will Never Come Back to San Angelo," *San Angelo Live*, March 5, 2019, https://sanangelolive.com/news/crashes/2019-05-23/watch-why-tornado-sirens-will-never-come-back-san-angelo

issues—even if sirens or alerts go off and are interpreted correctly—community members may ignore these warnings and instead go outside to spot the tornado rather than taking shelter.

The economic and housing impacts of tornadoes have the potential to devastate communities. The wind damage to homes and businesses can destroy homes, businesses and other infrastructure leading to financial and emotional loss for individuals and families as well as economic losses for communities.

Impacts: Confusion over what parts of the community are already or are going to be impacted may lead to a delay in response time for first responders leading to further injuries or deaths. This is compounded with the issue of potential limited telephone, internet, and power throughout the community; individuals may have limited ability to reach out for help, and when they do reach 911 or other emergency system first-responders, assistance may not be able to reach residents in time.

The recent EF3 tornado in Franklin, Texas, in 2019 provides an example of the impact tornadoes have on housing and businesses. 55 homes, a church, and four businesses were destroyed. The Robertson County Sheriff said that the damage is the worst he had seen in 23 years.[219]

Figure 2-41: Residential neighborhood after EF3 tornado hit Van, Texas, in 2015.[220]

[220] Photo by National Weather Service-Fort Worth.

2.6.12.3 *Food, Water, Sheltering*

Risks: Tornadoes hitting farmland are often described as fortunate events because the tornado is less likely to harm people or infrastructure.[221] However, tornadoes have the potential to destroy cropland and harm livestock in the tornado's path, creating a financial, emotional, and economic impact for local farmers and the community.

Similar to risks to shelters during a hurricane, the high winds during tornadoes have the potential to substantially damage all types of infrastructure throughout the community including water treatment plants and shelters. Although, as mentioned in the hurricane section, the state is making a concerted effort to increase the number of shelters along highway rest stops, local shelters are still at-risk during tornadoes. Due to the frequency with which tornadoes occur in conjunction with other hazards such as flooding, local shelters may be unreachable or may be hazardous to travel to during dual events.

Impacts: Community members who are in the path of multiple hazards—including flooding and tornadoes—may either be uncertain about whether to travel to a shelter or shelter in place; this may lead to an increase in injuries if individuals decide to stay in place and are impacted by tornadoes, flooding, hail, or lightning, or decide to travel to shelters only to encounter flooding, debris or other hazards that prevent them from reaching a shelter in time. Agricultural areas that are impacted by tornadoes may lose a significant portion of crops or lose livestock. For example, an EF-3 tornado touched down in East Texas in April 2019, destroying a dairy farm—killing numerous cattle and destroying equipment.[222]

2.6.12.4 *Transportation*

Risks: One of the most common themes between tornadoes and transportation is the idea to never try and outrun a tornado in a vehicle if the tornado is immediately nearby. However, if the tornado is not imminent, it is noted to use a vehicle to reach the nearest sturdy structure. While hiding under an overpass may seem like a secure location, tornadic winds are actually stronger in these openings, as they act as a channel for debris to fly through with risk of injury increasing. In moments of last resort, find a ditch or other lower elevation drainage conveyer usually found along transportation corridors and remain as low to the ground as possible.[223]

[221] Jason Samenow and Matthew Cappucci, "Severe storms, tornadoes, and flooding expected in Oklahoma and Texas through Monday night," *Washington Post*, May 20, 2019, https://www.washingtonpost.com/weather/2019/05/20/nightmare-scenario-destructive-tornadoes-severe-flooding-expected-oklahoma-texas-monday/

[222] Wyatt Bechtel, "Texas Dairy Picking Up the Pieces After Tornado Devastates Farm," *Dairy Herd Management*, April 26, 2019, https://www.dairyherd.com/article/texas-dairy-picking-pieces-after-tornado-devastates-farm

[223] Anna Norris, "What to Do if You See a Tornado While You're Driving," *The Weather Channel*, February 25, 2016, https://weather.com/safety/tornado/news/what-to-do-see-tornado-while-driving

Tornadoes bring substantial winds and can lift and throw any vehicle across large areas of land. If an individual cannot leave their vehicle, fastening the seatbelt and protecting vulnerable areas of the body is best practice. Tornadoes can also damage roadway signs and other transportation-associated infrastructure, and litter roads with debris that make them unsafe to travel during and after the tornadic activity. Debris caused by a tornado is one of the main reasons for transportation-related delays and roadways closures after a tornado hits an area. During a violent and sporadic weather event such as a tornado, public transportation service may also be delayed due to safety measures needing to take place. Even without a tornado touching down, tornado warnings themselves can lead to a pause in public and mass transit service.

Impacts: In April 2019, Cherokee County had three tornado touchdowns that closed multiple roads and left ground transportation in a precarious state.[224] These tornadoes downed powerlines, left large trees scattered on highways, and closed school operations for Alto ISD. Portions of U.S. Highway 69 were closed due to live electrical lines on the roadway while sections of State Highway 21, State Highway 294, FM 752, and FM 275 were closed due to wide-spread scattered debris and trees blocking traffic, as result of the tornadic activity.[225]

[224] "Cherokee County: NWS upgrades number of tornadoes to three," *Jacksonville Progress*, April 20, 2019, https://www.jacksonvilleprogress.com/news/cherokee-county-nws-upgrades-number-of-tornadoes-to-three/article_f9c50e4a-6394-11e9-8e8b-fbbde0319a81.html

[225] "Alto cancels classes, several roads closed due to storm damage, debris," *Jacksonville Progress*, April 13, 2019, https://www.jacksonvilleprogress.com/news/alto-cancels-classes-several-roads-closed-due-to-storm-damage/article_f809d1d0-5e44-11e9-b570-a7eabcebab0e.html

Figure 2-42: Residential tornado damage in Cherokee County, April 2019 tornadoes.[226]

2.6.12.5 *Health and Medical*

Risks: Due to the unpredictability of tornadoes, first responders and other medical personnel are critical to response and recovery efforts following these hazards. Medical surges—times when a large number of injured individuals are rushed to a hospital—are common during sporadic and unpredictable weather disasters. The commonality of tornadoes occurring with little to no warning while not following a predictable pattern can produce tornadic events that lead to quick and large spikes in the need for medical attentional for a large number of patients. Because of debris that is common with tornadoes, health and medical services may also have a difficult time reaching individuals in need as roadways and other transportation corridors may not be navigable. Roadway closures may also prove difficult for the safe movement of patients, along with the potential of evacuating medical locations that have been struck by a tornado.

Impacts: During a tornadic event that devastated portions of East Texas on April 29, 2017 it was reported by the East Texas Medical Center that 52 people were admitted to three different hospitals in the region. Out of the 11 deaths which occurred throughout the southern and midwestern portion of the United States during this weather event, 4 deaths could be attributed to the Canton-area tornadoes.[227] In total, seven tornadoes touched down in the East Texas counties of Henderson,

[226] Gary Bass, "NWS: New data confirms 6 tornadoes hit East Texas," *KLTV Channel 7, ABC,* April 19, 2019, https://www.kltv.com/2019/04/18/nws-new-data-confirms-tornadoes-hit-east-texas/

[227] Kurt Chirbas, Gemma DiCasimirro, Phil Helsel, and Daniella Silva, "11 Dead, Dozens Hurt After Tornadoes Hit Texas, South," *NBC News,* April 29, 2017,

Hopkins, Rains, and Van Zandt. The strongest tornado reached EF-4 status and brought 180 mph winds along its track from Eustace to Canton.[228]

Figure 2-43: Destroyed home in Canton, April 2017 tornadoes.[229]

2.6.12.6 *Hazardous Material (Management)*

Risks: When a tornado destroys a residential, commercial, or other structure, whatever is inside of that structure is scattered throughout the area. Waste management and cleanup is a large undertaking which must take place following a tornado, as debris can lead to hazardous situations that threaten both environmental and human health and safety. The potential of hazardous material being scattered throughout an area is also significant after a tornado, as the path of the event is difficult to predict and, therefore, difficult to plan for; when it comes to removing or bolting down toxic material and substances, these acts can be an afterthought. However, limiting the potential of hazardous material to saturate waterways and ground soil can help protect natural resources.

Impacts: After a tornado impacted the Arlington area in 2012 by tearing off roofs, destroying garages, collapsing walls, and flattening homes and other structures, items that were being stored inside these buildings were left scattered. Some of the noted items that were thrown by the tornado

https://www.nbcnews.com/news/weather/over-50-hurt-after-tornadoes-hit-east-texas-n752926

[228] "April 29, 2017 East Texas Tornado Event," National Weather Service, NOAA, https://www.weather.gov/fwd/tornadoes-29apr2017

[229] Jae S. Lee, "2 missing people found safe as heartbroken East Texas digs through destruction of 7 deadly tornadoes," *Dallas Morning News*, April 30, 2017, https://www.dallasnews.com/news/weather/2017/05/01/2-missing-people-found-safe-as-heartbroken-east-texas-digs-through-destruction-of-7-deadly-tornadoes/

include herbicides, pesticides, fluorescent light builds, car and household batteries, motor oil, transmission fluid, and paint substances. All of these materials, if exposed, can be hazardous; hazmat crews were brought in the area to collect and clean the impacted locations. The tornado, just in Arlington alone, was responsible for producing 12,000 pounds of waste.[230]

2.6.12.7 *Energy (Power & Fuel)*

Risks: Tornado strength winds can damage or destroy above-ground electric utilities during a tornadic event. Power outages are almost guaranteed, and energy grid infrastructure can become vulnerable when exposed to flying debris and high wind velocity associated with a tornado. Ultimately, anything that is power, or energy related that is not below ground can be damaged or destroyed. From above-ground fuel tanks and pipelines to power lines and transmission towers, infrastructure that is exposed can become unusable and leave thousands of individuals without electricity and other critical resources.

Impacts: On April 13, 2019, the city of Franklin was hit by an EF-3 tornado that left twelve individuals with injuries requiring treatment by medical officials. It was reported that a total of 55 homes were destroyed, an electrical transmission line destroyed, and an electrical distribution center was substantially damage.[231] Franklin, located about 65 miles to the southeast of Waco, had a majority of their 1,500 residents without power for up to 72 hours as a result of the tornado.[232] Robertson County Judge, Charles Ellison, was quoted as saying "we've lost about half of the south side of Franklin."[233]

[230] "Toxic Waste a Big Lesson in Tornado Storm Cleanup," *CBS DFW*, April 19, 2012, https://dfw.cbslocal.com/2012/04/19/toxic-waste-a-big-issue-in-tornado-storm-cleanup/
[231] "Tornado in Franklin destroys 55 homes, officials say," *The Eagle*, April 15, 2019, https://www.theeagle.com/news/local/tornado-in-franklin-destroys-homes-officials-say/article_3aefdefc-5f3c-11e9-b4dc-d3cd07fec248.html
[232] Josh Gorbutt, "THE LATEST: Parts of Franklin "totally destroyed" by EF3 tornado," *KBTX-TV*, April 13, 2019, https://www.kbtx.com/content/news/Heavy-damage-reported-following-tornado-in-Roberston-County-508540001.html
[233] Brandon Scott and Chloe Alexander, "'It looks like a bomb' | EF-3 tornado hits Franklin, Texas, causes widespread damage," *CBS KHOU News*, April 14, 2019, https://www.khou.com/article/news/local/texas/it-looks-like-a-bomb-ef-3-tornado-hits-franklin-texas-causes-widespread-damage/285-7a189c65-6487-4463-8a9b-face932457d4

Figure 2-44: Tornado damage in Franklin, April 2019.[234]

[234] Photograph by Rebecca Fledler, *The Eagle*, April 13, 2019, https://www.theeagle.com/franklin-tornado-jpg/image_05765016-5e39-11e9-8753-974ed29648c0.html

2.6.13 SEVERE WINDS

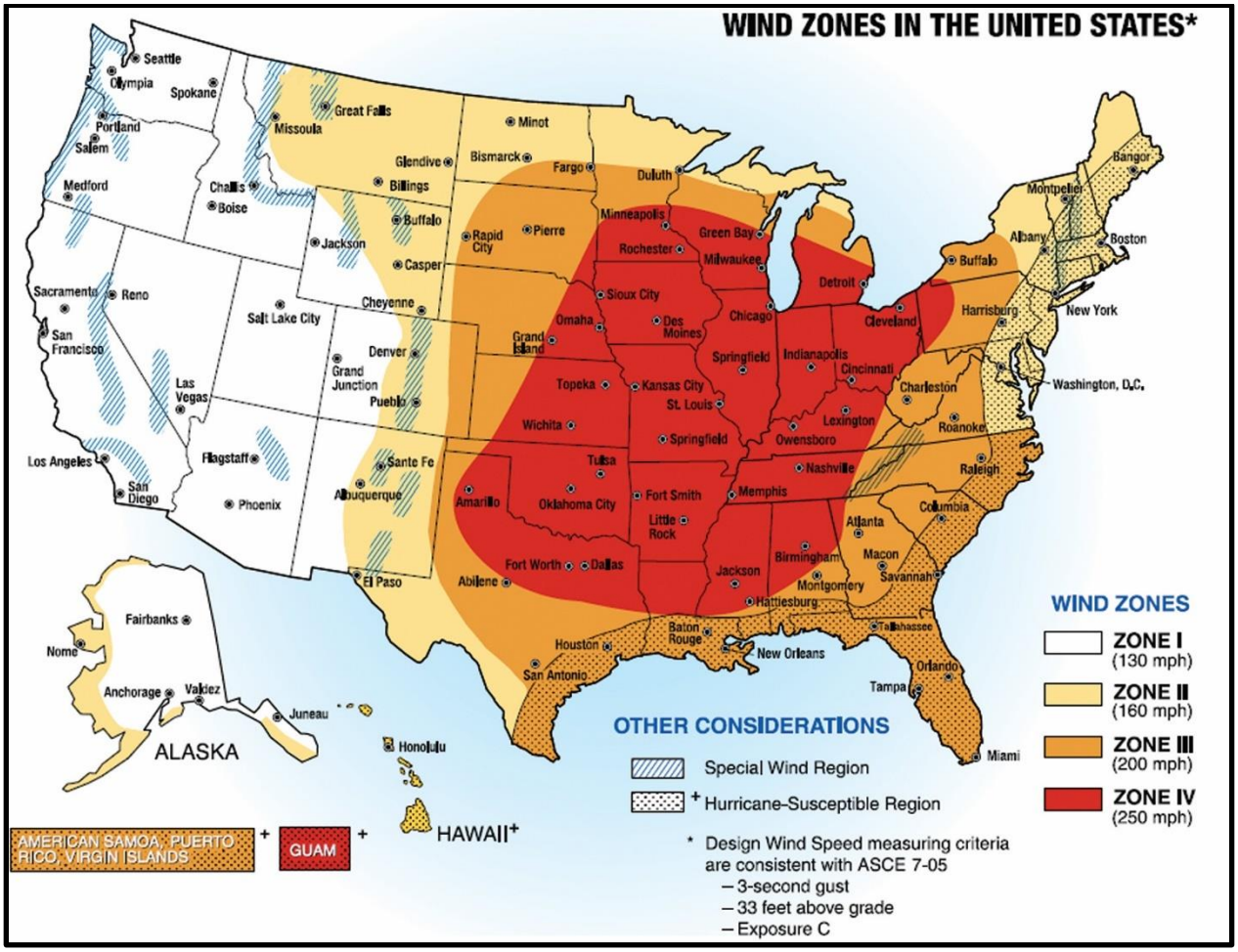
The SHMP defines severe winds as widespread, long-lived, straight-line wind events that can occur alone or sometimes accompany other natural hazards including hurricanes and severe thunderstorms. Severe wind events can happen anywhere in the state of Texas. The SHMP notes that severe winds pose a threat to lives, property, and vital utilities primarily due to the effects of flying debris, downed trees or structures, and interactions with power lines. The most damage severe winds cause is to structures of light construction (i.e., manufactured homes).

The below Wind Zone Map illustrates the wind risk zones of the entire U.S. based on the highest expected wind speeds. The map takes into account all wind hazards including those associated with severe thunderstorms, tornadoes, and hurricanes. The zones are associated with the highest wind speed for that region. The map also displays special wind hazard-prone areas. Wind speeds draw a parallel to design specifications of a shelter or safe room. Typically, Texans require a shelter/saferoom to withstand 160–200 mph wind with a maximum expectance of 250 mph.[235]

The SHMP notes that from 2018–2023, it is forecasted that severe winds will account for $338,496,656 in property losses, $30,697,559 in crop losses, 12 fatalities, and 108 injuries.

[235] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 172, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf

Figure 2-45: Wind Zones in the United States[236]



2.6.14 FEMA's Community Lifelines for Severe Winds

2.6.14.1 *Safety and Security*

Risks: Severe winds can feature in all of the above hazards and have the potential to include all of the above hazard's risks to government services and first responders. High winds alone can create unsafe driving conditions for first responders trying to reach community members, for community members trying to reach shelters, or for anyone trying to evacuate an impacted area. Winds also have the potential to damage public infrastructure, homes, businesses, and personal property—particularly by downing trees that fall on powerlines, buildings, or personal property. Winds may also exacerbate damage from other hazards; if winds damage a roof of a home, business, or other structure, water can intrude into the already damaged building, causing more damage. Strong

[236] "Double Jeopardy: Building Codes May Underestimate Risks Due to Multiple Hazards," National Institute of Standards and Technology, September 13, 2011, https://www.nist.gov/news-events/news/2011/09/double-jeopardy-building-codes-may-underestimate-risks-due-multiple-hazards

winds may damage power lines, hindering the continuation of public services for a prolonged period.

Impacts: Severe winds during the March 2019 thunderstorm in North Texas left more than 88,000 without power.[237] Similarly, in Longview, 90 mph winds left widespread damage including 17,000 customers without electricity.[238]

2.6.14.2 *Communications*

Risks: Severe winds alone may create the potential for power to be cut off. As explained above, power outages can prevent community members or first responders from seeking community members in need or seeking help. Power outages can be problematic, especially if these outages are at airports. If the power shuts off during high winds, this could lead to air controllers having limited communication with airplanes.[239,240] Similar to tornadoes, since high winds are associated with a variety of other potential hazards, this may lead to confusion over whether to stay in place during a wind event or travel to a local shelter.

Strong winds themselves can limit or halt travel not only for community members trying to get to work or school, but for freight and port traffic as well; this pause in commercial traffic has the potential to lead to significant economic impacts.

Impacts: Confusion over whether to stay in place or travel to a shelter may create a situation where increased injuries or deaths may occur. In April 2019, Lubbock County experienced a dust storm (a haboob) along with high winds of 65-80 km/h limiting visibility and causing numerous vehicle accidents.[241]

[237] Domingo Ramirez and Bill Hanna, "Storms pound North Texas as more than 88,000 without power in Tarrant, Dallas counties," *Star Telegram*, March 13, 2019, https://www.star-telegram.com/news/local/fort-worth/article227467204.html
[238] "NWS: Straight line winds caused damage in Longview," KLTV, May 10, 2019, https://www.kltv.com/2019/05/10/nws-straight-line-winds-caused-damage-longview/
[239] Jesus Jimenez and Claire Cardona, "Air traffic equipment restored at DFW Airport; storms move out of Dallas-Fort Worth," *Dallas Morning News*, June 24, 2019, https://www.dallasnews.com/news/weather/2019/06/24/air-traffic-equipment-restored-at-dfw-airport-storms-move-out-of-dallas-fort-worth/
[240] Jesus Jimenez, Loyd Brumfield, and Sarah Sarder, "Early morning storms produce powerful, damaging wind gusts up to 109 mph in Dallas-Fort Worth," *Dallas Morning News*, March 14, 2019, https://www.dallasnews.com/news/weather/2019/03/14/early-morning-storms-produce-powerful-damaging-wind-gusts-up-to-109-mph-in-dallas-fort-worth/
[241] Matthew Cappucci, "Massive Haboob Engulfed Lubbock Texas," *Washington Post*, June 6, 2019, https://www.washingtonpost.com/weather/2019/06/06/massive-haboob-engulfed-lubbock-texas-dust-wednesday-this-is-what-it-was-like/

2.6.14.3 *Food, Water, Sheltering*

Risks: Since severe winds are often associated with hurricanes and thunderstorms the risks and impacts associated with hurricanes are often associated with severe winds. Severe winds may blow debris such as tree limbs, powerlines, and other large items into the roadway. This may block distribution routes or may cut off power throughout a particular area. This may block individuals needing to reach a shelter.

Impacts: During a severe wind event in June 2019, at least 80,000 customers lost power including at least a half a dozen grocery stores in Dallas; these grocery stores had to temporarily close.[242]

2.6.14.4 *Transportation*

Risks: Much like tornadoes, severe wind can cause traffic delays and potentially damage transportation infrastructure, personal vehicles, and commercial vehicles. Traffic and road signs can succumb to high winds and fall to the ground. Vehicles which have a high center of gravity, including semi and delivery trucks, can be subject to powerful straight-line winds that may either lift of push these vehicles over. Severe winds can reduce the capacity of a roadway by littering roads with sand, wind-blown debris, and pushing standing water onto them making travel unsafe. During severe wind events, usually associated with thunderstorms, uprooted trees can also block and or damage transportation infrastructure. Windblown substances on roads can impact mobility by reducing the distance of visibility for a driver.[243]

Impacts: An early June 2019 high-wind and thunderstorm event in Dallas left the city with 41 percent of its traffic signals not working properly, 496 of its traffic signals not having any communication capabilities or left inoperable, and 168 traffic signals flashing red which caused major traffic delays throughout the area.[244]

[242] Jason Whitely, "Grocery Stores Saving Perishables in Refrigerated Trailers During Power Outage," *ABC News,* June 10, 2019, https://www.wfaa.com/article/weather/severe-weather/grocery-stores-saving-perishables-in-refrigerated-trailers-during-dallas-power-outage/287-5be68ce2-8bc2-4fb1-85c1-92bba96dd9d5

[243] "High Winds," U.S. Department of Transportation, Federal Highway Administration, accessed October 4, 2019, https://ops.fhwa.dot.gov/weather/weather_events/high_winds.htm

[244] "Important storm update information," city of Dallas, June 11, 2019, http://www.dallascitynews.net/important-storm-update-information

Figure 2-46: Uprooted tree-damaged sidewalk infrastructure and blocked roadway in Dallas, June 2019, following severe winds associated with thunderstorms.[245]

2.6.14.5 *Health and Medical*

Risks: Health and medical facilities, like all structures, are vulnerable to severe wind or other high wind events that come with hurricanes, tropical storms, and thunderstorms. Because high-profile vehicles are susceptible to being pushed over or flipped during severe wind events, the operators of ambulances and other large patient transport vehicles must be aware and cautious when attempting to move people, making sure not to risk injury to the patients or the first responders themselves. Downed power lines and scattered debris may leave roads and other access points unavailable in an attempt to reach patients as well. High winds can cause a delay in medical service due to debris and potential power outages from downed power lines. Hospitals with helicopter service can also be affected by windstorm events as air travel may not be a safe or viable option. Windstorm events, as noted earlier, can lead to low-visibility situations as well. If winds are not strong enough to detour a medical helicopter from reaching patients, visibility concerns may leave the same helicopter grounded.

Impacts: When a severe windstorm hit Abilene on May 2019, 62 community members of the Willow Springs Health and Rehabilitation Center had to be relocated due to unsafe facility conditions caused by 70 mph severe winds.[246]

[245] Photograph by Anne Ziemba, Dmagazine, June 11, 2019, https://www.dmagazine.com/frontburner/2019/06/your-daily-dallas-electrical-outage-update/
[246] Greg Jaklewicz, Timothy Chipp, Laura Gutschke, and Ronald W. Erdrich, "Tornado, storm causes major damage in Abilene near Winters Freeway and South 7th," *Abilene Reporter-News*, May 18, 2019, https://www.reporternews.com/story/weather/2019/05/18/storm-causes-major-damaged-abilene/3718948002/

2.6.14.6 *Hazardous Material (Management)*

Risks: Severe winds have the ability to mangle what would appear to be sturdy and secure pipes, storage facilities, large transport vehicles, homes, and businesses. If wind damage has occurred to a home, especially a garage or storage shed that is holding household hazardous materials such as fuel, corrosive cleaners, pesticides, pool chlorine, paints, wood stains or varnishes, these items could then be exposed and leak into the environment.[247] These leaks would prove to be a hazard to both human and environmental health for those in the immediate area or, if leaked into a river, a downstream junction. Private businesses that sell household hazardous materials, or businesses that store more corrosive chemicals, can succumb to the same damage and expose the potentially harmful materials if not protected from severe wind damage. Businesses who use large and high-profile vehicles, such as semi-trucks, to transport hazardous material also pose a risk as these types of vehicles can easily tip over if the severe winds are powerful enough.

Impacts: A hazardous spill on U.S. Highway 287, near Childress on June 8, 2018, allowed corrosive and acidic liquids to leak out of an overturned semi-truck. Severe winds caused the semi-truck to overturn and led to the hazardous material spill. This required a hazmat crew to address the hazard and forced traffic to be rerouted throughout the area.[248]

[247] "Household Hazardous Waste: A Guide for Texans," Texas Commission on Environmental Quality, https://www.tceq.texas.gov/p2/hhw

[248] Debra Parker, "Hazmat spill forces traffic to be rerouted near Childress," *ABC 7 News*, June 8, 2018. https://abc7amarillo.com/news/local/hazmat-spill-forces-traffic-to-be-rerouted-near-childress

Figure 2-47: Overturned semi truck outside Amarillo following severe wind in June 2018.[249]

2.6.14.7 *Energy (Power & Fuel)*

Risks: Severe winds can lead to trees, above ground structures, and other debris falling onto utility lines and other energy production and transmission infrastructure. Severe winds can also damage utility infrastructure itself, by snapping utility poles, bending transmission towers, and knocking transformers off their platforms.[250] During severe wind events that cause power outages, homes and businesses can be left without power for days to weeks at a time. These power outages can have economic effects on businesses. Home and business property damage can also occur if utility infrastructure falls, due to the winds, onto home or business structures and material. Above ground power lines seem to be more susceptible to wind damage than other utility infrastructure and can lead to further hazards as live wires can be dangerous to be around and handle. For example, during high wind events, if a downed power line is still live and sparks a fire, high winds can greatly aid the fire by fueling and spreading its flames over larges distances.[251] This can put homes and

[249] Photograph by Debra Parker, *ABC 7 News*, June 8, 2018, https://abc7amarillo.com/news/local/hazmat-spill-forces-traffic-to-be-rerouted-near-childress

[250] Monica Lopez and Tim Acosta, "Kingsville storm damage: Thousands without power; high winds, rain cause damage," *Corpus Christi Caller Times*, June 7, 2019, https://www.caller.com/story/weather/2019/06/07/kingsville-storm-tornado-damage-outages/1379266001/

[251] Kristina Pydynowski and Alex Sosnowski, "High winds threaten more damage, power outages and brush fires in southwestern US," *AccuWeather*, July 1, 2019, https://www.accuweather.com/en/weather-news/high-winds-threaten-more-damage-power-outages-and-brush-fires-in-southwestern-us/333082

businesses who were not in the immediate area of the severe winds in levels of danger for a different kind of hazard.

Impacts: When Hurricane Harvey made landfall, near Rockport, peak wind gusts reached 152 mph.[252] Due to the severe winds, 220,000 customers were without power throughout the Corpus Christi region. The highest concentration of power outages in this region were observed around the Aransas Pass-Rockport area. When power outages were at their peak, 47,000 customers were left without power in the immediate Aransas Pass-Rockport portion of the region.[253] Most areas that were impacted were able to regain power between August 27, 2017 and September 2, 2017. Several locations in the Houston area that were inaccessible, due to severe flooding, were not restored until September 8.[254]

[252] "Major Hurricane Harvey – August 25-29, 2017," National Weather Service, NOAA, accesses October 14, 2019, https://www.weather.gov/crp/hurricane_harvey

[253] John C Moritz, "Harvey 2017: Here's the latest on power outages in the Corpus Christi area," USA Today Network, August 30, 2017, https://www.caller.com/story/weather/2017/08/25/harvey-2017-heres-latest-power-outages-corpus-christi-area/603084001/

[254] *Hurricane Harvey Event Analysis Report:* March *2018*, North American Electric Reliability Cooperation, page VI, March 2018, https://www.nerc.com/pa/rrm/ea/Hurricane_Harvey_EAR_DL/NERC_Hurricane_Harvey_EAR_20180309.pdf

2.6.15 WILDFIRE

In Texas, humans and their activities cause more than 90 percent of all wildfires.[255] The SHMP defines wildfire as a sweeping and destructive burning conflagration and can be further categorized as wildland, interface, or intermix fires. The probability of wildfire is dependent on multiple conditions. These conditions include local weather, topographic factors, and the presence of natural vegetation which acts as fuel for the wildfire. While a variety of conditions can help predict the occurrence of wildfires, wildfire behavior can be unpredictable. The unpredictability of wildfires is due to the limited understanding of the ecological response to wildfire, limited or inaccurate data on local conditions, and limited prioritization of resources.[256,257]

Nearly 18 million people (roughly 70 percent of the population of Texas), as of 2018, live within the wildland urban interface, the largest at-risk population of any state in the nation. By 2050, Texas' average number of days with high wildfire potential is projected to double from 40 to nearly 80 days a year. [258]

Wildfires can result in and cause widespread damage to residential, commercial, and government owned land and property. Loss of life and injury is also a concern with wildfires. From 1996–2016, the SHMP notes that there were 31 reported fatalities and 170 reported injuries attributed to wildfires throughout the state. The SHMP notes that from 2018-2023, it is forecasted that wildfires will account for $330,190,566 in property losses, $89,490,775 in crop losses, 15 fatalities, and 79 injuries. Flooding, particularly flash flooding, is more likely to occur after a wildfire, because wildfires may make the ground less able to absorb water. These flooding events may occur outside of known flood areas and may be more severe due to the wildfire altering terrain and ground conditions.[259,260] Due to the wide range of damages that can be seen after wildfires, wildfire mitigation efforts need to consider Land Use Plans that address density and quantity of development, as well as emergency access, landscaping and water supply considerations.

A wildfire's potential intensity, known as the Fire Intensity, can be presented through a standard form of measurement known as the Fire Intensity Scale (FIS). This helps individuals determine

[255] "Preparing for Wildfires," Texas A&M Forest Service, accessed October 4, 2019, https://tfsweb.tamu.edu/PreventWildfire/
[256] Mathew Thompson and Dave Calkin, "Uncertainty and risk in wildland fire management: A review," *Journal of Environmental Management*, April 13, 2011, https://www.fs.fed.us/rm/pubs_other/rmrs_2011_thompson_m002.pdf
[257] Chris Baraniuk, "The Quest to Predict- and Stop- The Spread of Wildfires," *BBC*, October 8, 2018, http://www.bbc.com/future/story/20180924-the-quest-to-predict-and-stop-the-spread-of-wildfires
[258] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 103, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[259] "Flood After Fire," FEMA, accessed January 17, 2020 https://www.fema.gov/flood-after-fire
[260] "Flood After Fire Fact Sheet" FEMA, accessed January 17, 2020 https://www.ready.gov/sites/default/files/Flood_After_Fire_Fact_Sheet.pdf

the power of a wildfire while also giving an idea of the potential for harm and danger toward life and property. The FIS consists of 5 classes, where the minimum class is 1 and the highest class is 5. The SHMP presents the scale in the table below.

Table 2-7: Fire Intensity Scale (FIS) Classes[261]

Fire Intensity Scale (FIS) Classes	
Class	Description
Class 1 - Very Low	Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.
Class 2 - Low	Small flames, usually less than 2 feet long; small amount of very short-range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.
Class 3 - Moderate	Flames up to 8 feet in length; short-range spotting is possible. Fires hard to suppress; trained firefighters require support from aircraft or engines, dozers and plows to be effective. Increasing potential for harm or damage to life and property.
Class 4 - High	Large flames up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.
Class 5 – Very High	Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

2.6.16 FEMA's Community Lifelines for Wildfire

2.6.16.1 *Safety and Security*

Risks: Similar to other hazards, wildfires particularly large wildfires need a wide variety of first responders. In 2011, the Texas A&M Forest Service mobilized 16,690 emergency responders, 244 bulldozers, 986 engines, and 255 aircraft from around the nation to respond to fires across the state.[262] While response to wildfires is highly organized throughout the state—with multiple

[261] Ibid, page 182, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf

[262] "2011 Texas Wildfires Common Denominators of Home Destruction," Texas A&M Forest Service, page 16, https://tfsweb.tamu.edu/uploadedFiles/TFSMain/Preparing_for_Wildfires/Prepare_Your_Home_for_Wildfires/Contact_Us/2011%20Texas%20Wildfires.pdf

interlocal agreements between state, and federal resources—past events show that local first responders and agencies are understaffed and do not have the equipment to address large scale wildfires.[263,264,265] This limited capacity to respond to wildfires increases the likelihood of miscommunication, first responder fatigue, and accidents. Compounding this lack of capacity is the increased likelihood of wildfires to reach across hundreds to thousands of acres and be sustained for days to weeks; rapid population growth and development in the wildland-urban interface are factors in this increase.[266]

Along with the limited staff capacity, wildfires themselves are unpredictable; this unpredictability can cause first responders, particularly firefighters, to become entrapped, dehydrated, overheated, or wreck vehicles including trucks, helicopters and airplanes.[267],[268]

[263] Sarah Rafique and Josie Musico, "Majority of Texas Fire Departments Staffed by Volunteer Firefighters," *Claims Journal*, December 7, 2016, https://www.claimsjournal.com/news/southcentral/2016/12/07/275425.htm
[264] Karen Jackson, "Case Study of the 2015 Hidden Pines Wildland-Urban Interface Fire in Bastrop, Texas," Bastrop County Office of Emergency Management, March 31, 2016, https://www.co.bastrop.tx.us/upload/page/0027/docs/HPF_Case_Study_final_03312016.pdf
[265] Ross Ramsey, "For Fire Departments, More to State Budget Than Numbers," *Texas Tribune*, May 3, 2013, https://www.texastribune.org/2013/05/03/more-texas-budget-numbers/
[266] "Fire Danger: Wildfire Risk," Texas A&M Forest Service, accessed October 4, 2019, https://tfsweb.tamu.edu/WildfireRisk/
[267] Robert Avsec, "3 Heat Related Threats to Firefighters and How to Fix Them," *Fire Rescue*, May 21, 2014, https://www.firerescue1.com/fire-products/fire-rehab/articles/1917068-3-heat-related-threats-to-firefighters-and-how-to-fix-them/
[268] "Fighting Wildfires," Centers for Disease Control, accessed October 4, 2019, https://www.cdc.gov/niosh/topics/firefighting/

Figure 2-48: Texas National Guard assists with the 2011 Possum Kingdom Wildfire.[269]

Impacts: First responder fatigue and illness, miscommunication, and accidents may all lead to an increase of injuries and deaths, along with increased financial loss to replace equipment or vehicles. A 2006 wildfire in four rural counties, Hutchinson, Roberts, Gray, and Donley counties, led to the death of a volunteer firefighter. The firefighter tried to drive a water truck away from oncoming flames, not knowing that another team had removed vegetation- creating soft soil; the truck slid on the soil leading to the truck crashing and the driver dying. [270] In 2011 during the wildfires in Bastrop, two volunteer firefighters were trapped between two fires when they turned into the wrong driveway and had their truck stuck in sand.[271]

2.6.16.2 *Communications*

Risks: Similar to hurricanes and tornadoes, the wide array of state and national first responders converging with local responders to fight large scale wildfires, creates communications challenges, because of the different communication equipment and protocols involved; these different methods of communication have the potential to lead to a lack of communication or miscommunication.[272]

[269] Photography by SSG Malcom McClendon, Texas Military Department.
[270] "Wildfire Related Deaths," Centers for Disease Control, August 3, 2007, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5630a1.htm
[271] "Trial by Fire," *Texas Monthly*, December 1, 2011, https://www.texasmonthly.com/articles/trial-by-fire/
[272] Samuel Sutton, "Pilot Instrumental in Fighting Sterling County Wildfires Dies in Helicopter Crash" *GoSanAngelo*, July 5, 2018. https://www.gosanangelo.com/story/news/local/2018/07/05/pilot-instrumental-fighting-wildfires-dies-helicopter-crash/756420002/

Compounding the potential miscommunication, is that the majority of wildland in Texas is privately owned, creating communication challenges between private landowners, first responders, and federal officials.[273] The unpredictability of wildfires may also lead to miscommunication, particularly between on the ground and air response teams.

The economic impact from wildfires is immense. Wildfires can destroy homes and local businesses, displacing employees and employers for a prolonged period of time. The timber industry, particularly in East Texas, represents approximately an $18 billion industry; wildfires destroy timber products that are the basis of this industry.[274]

Impacts: The lack of communication or miscommunication may lead to increases in injuries, deaths, and financial loss as described above in the safety section. Fires throughout the state in 2011 destroyed over 3,000 structures including approximately 2,947 homes.[103] It cost approximately $20 million to just clean up the debris just in Bastrop County.[275] The 2011 wildfires also destroyed over $1.6 billion worth of timber products, representing a potential $3.4 billion economic impact in East Texas.[276] The Possum Kingdom Wildfire in 2011 destroyed over 249 homes, a restaurant and a church.[277]

[273] Cindy Devone-Panchero, "2011 Texas Wildfires: Two Perspectives," *Fire Rescue*, December 1, 2011, https://firerescuemagazine.firefighternation.com/2011/12/01/2011-texas-wildfires-two-perspectives/#gref
[274] "Texas 2019," Texas A& M Forest Service, http://tfsfrd.tamu.edu/economicimpacts/Texas%20Flyer/Texas2019.pdf
[275] Mary Huber, "Five Years After Devastating Fire, Bastrop County Still Recovering," *Austin American-Statesman*, September 26, 2018, https://www.statesman.com/news/20160915/five-years-after-devastating-fire-bastrop-county-still-recovering
[276] "East Texas Wildfires Destroy $97 million worth of Timber," Texas A&M Forest Service, https://tfsweb.tamu.edu/Content/Article.aspx?id=27432
[277] Trey Wallace and April Castro, "Damage Estimates Double in Possum Kingdom Fire," *NBC DFW*, April 19, 2011, https://www.nbcdfw.com/weather/stories/Damage-Estimates-Double-in-Possum-Kingdom-Fire-120227884.html

Figure 2-49: Homes on fire during the Possum Kingdom Wildfire in 2011.[278]

2.6.16.3 *Food, Water, Sheltering*

Risks: Potable water quality has the potential to decrease after wildfires due to increased erosion, diminished reservoir capacity, and ash, debris, other chemicals settling on or floating into lakes and rivers.[279] The treatment of contaminated water can also be costly and time consuming for local communities.[280, 281]

The unpredictability of how the wildfire may spread can create uncertainty in whether community members will follow an evacuation order for a particular area. Community members may stay behind after evacuations have been ordered assuming that they can defend their home or will not be in the path of the wildfires, but then need to evacuate suddenly when they realize they are in the wildfire's path.[282] Wildfires travel quickly with a fire taking less than half an hour to travel 2 miles resulting in the need for residents to quickly evacuate.[124] This uncertainty inherent during evacuations coupled with the need for quick response times creates the potential for confusion between first responders, who may not know who has evacuated or who has stayed, potentially

[278] Photography by SSG Malcolm McClendon, The United States National Guard.
[279] Ed Struzik, "How Wildfires are Polluting Rivers and Threatening Water Supplies," *Yale University*, October 2, 2018, https://e360.yale.edu/features/how-wildfires-are-polluting-rivers-and-threatening-water-supplies
[280] "Water Quality After a Wildfire," United States Geological Survey, accessed October 4, 2019, https://ca.water.usgs.gov/wildfires/wildfires-water-quality.html
[281] "Wildfires: How Do They Affect Our Water Supplies?" United States Environmental Protection Agency, https://www.epa.gov/sciencematters/wildfires-how-do-they-affect-our-water-supplies

increasing the number of accidents than can occur if residents are trying to quickly leave their neighborhood.

Impacts: The impacts to the water supply after a wildfire can be long lasting and unpredictable. Over time, impaired water supply can lead to an increase of medical conditions, injuries, or loss of life. The suddenness and unpredictability of wildfires also creates an uncertainty of how many shelters are needed and where shelters should be placed. In 2011, 5,000 people had to be evacuated and dozens of shelters had to be set up in Bastrop County, including shelters for hundreds of animals.[283,284] During the 2011 Bastrop County Complex fire, there was such a need for shelters that local hotels were utilized; some evacuees were sleeping outside of shelters on picnic tables.[285]

2.6.16.4 *Transportation*

Risks: In Texas, wildfires can lead to large scale disruptions and delays across transportation networks. Roadways which either go through a wildfire or are near a wildfire may need to be closed due to safety concerns and issues concerning visibility. These closures affect all forms of ground transportation including cars and other personal vehicles, commercial vehicles and business delivery services, public transit providers, emergency services such as ambulance service and firefighters, and others. Renters and homeowners may also not be able to access their properties if wildfires caused a road closure. The same can be said about private businesses: if consumers cannot reach a business, then these locations cannot provide desired services. Road closures can also create traffic concerns on other roadways, as these arterials may be the only other option for entry and exit of an area. Risk of damage to local transportation infrastructure due to high levels of heat from fire or burning debris is also a concern. Smoke from a wildfire can lead to unsafe travel conditions that may impact all forms of transportation including aerial, ground, and water through poor visibility and inhalation hazards.

Impacts: On September 4, 2011, wildfires in Travis County threatened the neighborhood of Steiner Ranch which has only 2 ways in and out for nearly 18,000 community members who call the neighborhood home.[286] As flames and cinders drifted across RM 620 and made their way to nearby homes, evacuations took place.[287] Due to the limited roadway entry and exit points for the

[283] "High Winds Whip Up Texas Wildfires," *NPR*, September 5, 2011, https://www.npr.org/2011/09/05/140194891/high-winds-whip-up-texas-wildfires
[284] Greg Cima, "Hundreds of Animals Recovered Near Bastrop Fires," *American Veterinary Medical Association*, October 26, 2011, https://www.avma.org/News/JAVMANews/Pages/111115o.aspx
[285] "Death Toll Rises in Texas Wildfires," *NBC News*, September 6, 2011, http://www.nbcnews.com/id/44405434/ns/weather/t/rising-death-toll-texas-wildfires/#.XXlwP-hKg2w
[286] "Steiner Ranch Demographics," *Point2Homes*, accessed September 16, 2019, https://www.point2homes.com/US/Neighborhood/TX/Austin/Steiner-Ranch-Deographics.html
[287] Rob Maxwell, "Residents addressing wildfire risks in Lake Travis, Westlake," *Community Impact Newspaper*, May 16, 2018, https://communityimpact.com/austin/lake-travis-westlake/features/2018/05/16/residents-addressing-wildfire-risks-in-lake-travis-westlake/

neighborhood of, Travis County began to analyze the expansion of vehicular evacuation paths for Steiner Ranch.

Figure 2-50: Evacuations from Steiner Ranch in Travis County, 2011 Wildfire.[288]

2.6.16.5 *Health and Medical*

Risks: Wildfires can damage health and medical structures, limit the admittance of patients and the movement of patients to those facilities by blocking roads and other transport modes, and restrict hospitals and other medical providers' ability to receive assistance by limiting accessibility. If wildfires occur near large population areas, evacuations, the provision of shelters, and treatment of burns and smoke inhalation may be necessary. Increased business and housing development adjacent to or on wildfire-prone areas has also recently increased, placing more people at risk. The impact of wildfire smoke is also a large public health issue that can affect thousands of people and locations hundreds of miles away.[289] The make-up of wildfire smoke usually consists of carbon dioxide, water vapor, carbon monoxide, particulate matter, hydrocarbons, nitrogen oxides, and trace elements. However, substances that are in the wildfire smoke can differ from wildfire to wildfire and are contingent on the fire's temperature, fuel source, and the conditions of the surrounding wind.[290]

[288] Photography by Brittany Glas, KXAN Austin, February 2017, https://www.kxan.com/news/steiner-ranch-evacuation-route-up-for-2-7-million-vote-tuesday/
[289] "Wildfires and Public Health: A View from the Front Lines," U.S. Climate and Health Alliance, http://usclimateandhealthalliance.org/wildfires-public-health-view-front-lines/
[290] Bryan Moy, "Wildfires and Public Health: A View from the Front Lines," U.S. Climate and Health Alliance, accessed September 20, 2019,

Impacts: Wildfires took the lives of four individuals after burning nearly 500,000 acres of land throughout the Texas Panhandle in early March 2017. Three of those deaths occurred in Gray County, where one fatality was accredited to smoke inhalation and two fatalities were accredited to burns. In Ochiltree County, 500 animals were killed as three to five commercial hog barns burned to the ground.[291] The smoke associated with the wildfires, measured by the Texas Commission on Environmental Quality (TCEQ), also affected the air quality for the Amarillo region with levels of sulfur dioxide measured as being unhealthy for sensitive groups.[292]

2.6.16.6 *Hazardous Material (Management)*

Risks: Damages caused by a wildfire depends on the overall extent, size, heat levels, and other variables. Debris damage can include items from destroyed homes and businesses containing household waste, other structures holding waste, hazardous waste, green waste, or other personal and commercial property.[293] Chemical storage facilities, if encroached upon by wildfire, can explode and cause harm to human and environmental health. These explosions, if large enough, can damage or destroy nearby homes and businesses while also effecting other critical operations and needs throughout an area. The smoke produced by a wildfire can contain hazardous material as chemicals and other substances can be engulfed by the fire and, as the chemicals or other hazardous material burn, travel with the winds over a widespread area.[294] Once a fire has burned down or scorched a home, business, or other location, the ash and other debris may be contaminated and must be disposed of quickly and properly as to minimize the exposure of these materials to people and the environment. Commercial structures have been found to contain more hazardous substance and materials in its ash than residential structures and properties.[295]

Impacts: After a wildfire, debris and waste management is critical to cleaning hazardous material or substances which could have been spread or burned, reported by The Texas Commission on Environmental Quality.[296]

http://usclimateandhealthalliance.org/wildfires-public-health-view-front-lines/

[291] Ronald Balaskovitz, "Texas Panhandle wildfires take lives, burn nearly 500,000 acres," *Amarillo Globe-News,* March 7, 2017, https://www.amarillo.com/news/local-news/2017-03-07/texas-Panhandle-wildfires-take-lives-burn-nearly-500000-acres

[292] "Air Quality Index Report: March 7, 2017," Texas Commission on Environmental Quality, https://www.tceq.texas.gov/cgi-bin/compliance/monops/aqi_rpt.pl

[293] "Wildfires," United States Environmental Protection Agency, https://www.epa.gov/natural-disasters/wildfires

[294] Tom Christopher, "Texas petrochemicals blaze blankets Houston area in black smoke," *CNBC,* March 19, 2019, https://www.cnbc.com/2019/03/19/texas-petrochemicals-blaze-blankets-houston-area-in-black-smoke.html

[295] "Emergency Guidance on Wildfires #1," Department of Toxic Substances Control, https://www.ihs.gov/california/tasks/sites/default/assets/File/DEHS%20Portal/WildFire_Emergency_Guidance_FS_1.pdf

[296] "Managing Debris from Texas Wildfires," Texas Commission on Environmental Quality, https://www.tceq.texas.gov/assets/public/response/drought/managing-wildfire-debris.pdf

2.6.16.7 *Energy (Power & Fuel)*

Risks: Damaged power lines, also known as transmission lines, and other above ground electric utility infrastructure can create devastating wildfires if not mitigated properly. In 2011, for example, the Bastrop County Complex fire was reportedly caused by a number of loblolly pine trees falling onto a string of electrical lines.[297] According to the Texas Wildfire Mitigation Project, power lines can spark wildfires through multiple mechanisms. Downed lines, vegetation contact, conductor slaps, repetitive faults, and apparatus failures are the most common ways power lines and utility infrastructure can lead to wildfires. As of 2015, there were nearly 26,000 miles of electric transmission lines, also known as power lines, throughout Texas.[298]

Impacts: The Bastrop County Complex fire, mentioned earlier and caused by downed electrical power lines, burned a total of 34,000 acres, lit 1,660 homes on fire, and killed two people while injuring 12 others. Another example of a much smaller wildfire caused by power lines occurred on May 8, 2018 as sparks from a power line in Big Spring caused a wildfire within its city limits. While no injuries or fatalities occurred, this fire was within 50 yards of a nearby apartment complex and threatened the lives of many people living there while the fire grew to a size of 15 acres. As a result of the fire, 1,600 homes and business were also without power for a period of time.[299] In recent years, power lines have led to more than 4,000 wildfires in Texas.[300]

[297] Mary Huber, "Five years after devastating fire, Bastrop County still recovering," *Austin-American Statesman*, September 15, 2016.
https://www.statesman.com/news/20160915/five-years-after-devastating-fire-bastrop-county-still-recovering
[298] "State of Texas: Energy Sector Risk Profile," United States Department of Energy,
https://www.energy.gov/sites/prod/files/2015/06/f22/TX_Energy%20Sector%20Risk%20Profile.pdf
[299] Laura Gutschke, "Big Spring area firefighters battle two wildfires that destroyed homes, caused power outages," *Abilene Reporter News*, May 8, 2019,
https://www.reporternews.com/story/news/local/texas/2018/05/08/two-big-spring-wildfires/591954002/
[300] "How Do Powerlines Cause Wildfires?" Texas Wildfire Mitigation Project,
https://wildfiremitigation.tees.tamus.edu/faqs/how-power-lines-cause-wildfires

Figure 2-51: Bastrop County Complex fire smoke from Highway 71, 2011.[301]

[301] Lizzie Chen, "New Mandatory Evacuation Orders in Bastrop County," *KUT News*, September 5, 2011, https://www.kut.org/post/new-mandatory-evacuation-orders-bastrop-county

2.6.17 WINTER WEATHER

The SHMP discusses the impacts of severe winter weather including downed trees, widespread power outages, damaged property, and injury and death. The effect of severe winter storms on Texas is quite disruptive compared to other regions that normally experience severe winter weather. In Texas, a heavy snowfall for the state is an accumulation of 4 or more inches of snow in a 12-hour period. This amount of snow accumulation usually occurs in the northern half of the state and in the higher elevations of West Texas. Winter weather events from Del Rio to Port Arthur are relatively rare. The most severe snow event, blizzards, is most likely to occur in the Texas Panhandle and South Plains Regions.

The SHMP notes that an ice storm occurs when rain falls out of the warm upper layers of the atmosphere into a cold and dry layer near the ground. The rain freezes on contact with the cold ground and accumulates on exposed surfaces. Damage can occur with half an inch of rain freezing on trees and utility wires; the damage increases if there are high winds. Based on this, an icing event is categorized as an ice storm at half an inch.

The size of Texas means that certain portions of the state are more vulnerable than others to severe winter weather. The SHMP points to the Texas Panhandle and North Central Texas region around Dallas and Texarkana as most vulnerable to severe winter storms. At the same time, these areas are better prepared for severe winter weather. The southern portions of the state are not as likely to incur severe winter weather, but when it does happen, the impacts are much stronger because the communities and governments are not as prepared.[302] The SHMP notes that from 2018–2023, it is forecasted that winter weather will account for $100,081,159 in property losses, $3,572,851 in crop losses, 29 fatalities, and 319 injuries.

2.6.18 FEMA'S COMMUNITY LIFELINES FOR WINTER WEATHER

2.6.18.1 *Safety and Security*

Risks: The SHMP notes that while North Texas and the Panhandle are more likely than the rest of the state to see winter weather, when winter weather does impact southern Texas, communities are generally not as prepared as other communities in Texas.[303] While TxDOT and local road crews do pretreat roads right before winter weather events, community officials often urge community members to simply stay off roads until it becomes warm enough for roads to clear of ice or snow.[304]

[302] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 189, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[303] Ibid, page 189.
http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[304] Meagan Flynn and Robert Downen, "The latest: Houston area braces for ice storm, potentially dangerous conditions," *Houston Chronicle*, January 15, 2018,

At the same time, community members may not follow local officials directions and try to drive on icy roads leading to an increase in accidents due to residents unaccustomed to driving on snowy or icy roads or not seeing black ice on roadways.[305] If community members do stay at home, they may not prepared for the cold conditions, or are concerned about high electric bills, leaving their heat off. Further, furnaces may break, or power outages may occur. Increased use of furnaces, fireplaces, and portable heaters increase the possibility of house fires or other infrastructure fires as well.[306]

All of these factors increase the likelihood that first responders need to travel during hazardous road conditions in order to address accidents, or residents needing assistance at home. In addition to first responders traveling on unsafe roads, winter weather may close government buildings and schools; these closures may delay public services.

Impacts: The consequences of residents traveling on icy roads is an increase in first responders or community members injuring themselves or dying. A firefighter died trying to respond to a weather-related accident after being struck by a vehicle in Dallas in 2014 during an ice storm.[307] Additionally, the city of Houston saw freezing rain, ice, and snow on January 16, 2018. Despite Houston officials urging community members to stay home, there were over 300 car accidents in a 9-hour period on January 16; this compares to approximately 226 car accidents in a 24-hour period on a typical day in Houston.[308] This same winter event prevented approximately 1.1 million students from attending school. During the first week of January 2019, Abilene saw up to 4 inches of snow, black ice, and temperatures below 30 degrees; the snowy and icy road conditions led to police responding to at least 90 accidents on January 3, 2019.[309] In February 2016, a baby died due to a space heater being too close to other household items, causing a house fire.[310]

https://www.chron.com/news/houston-weather/article/Arctic-cold-front-may-bring-freezing-rain-sleet-12498562.php

[305] "Icy Roads Cause 800 Wrecks All Over Houston," *Officer*, February 5, 2011, https://www.officer.com/home/news/10252127/icy-roads-cause-800-wrecks-all-over-houston

[306] "Safety tips for winter fires," Edwards Airforce Base, January 15, 2013, https://www.edwards.af.mil/News/Article/394164/safety-tips-for-winter-fires/

[307] "At Least 4 Deaths During North Texas Icy Weather," *CBS DFW*, February 11, 2014, https://dfw.cbslocal.com/2014/02/11/at-least-4-deaths-during-north-texas-icy-weather/

[308] Jonathan Martine, "Hundreds of accidents reported as Houston area deals with icy roads," *Click2Houston*, January 16, 2018, https://www.click2houston.com/news/hundreds-of-accidents-reported-as-houston-area-deals-with-icy-roads

[309] Jesus Martinez, "Dallas-Fort Worth was spared snowfall, but other parts of Texas weren't so lucky," *Dallas Morning News*, January 3, 2019, https://www.dallasnews.com/news/weather/2019/01/03/dallas-fort-worth-was-spared-snowfall-but-other-parts-of-texas-weren-t-so-lucky/

[310] "Infant Dies in Leander Mobile Home Fire," *Fox 7 News Austin*, February 23, 2015, https://www.fox7austin.com/news/infant-dies-in-leander-mobile-home-fire

2.6.18.2 *Communications*

Risks: Winter weather can damage or destroy powerlines throughout impacted areas, because of ice accumulating on powerlines or trees falling over from the weight of ice accumulation on powerlines. Damaged or destroyed powerlines have the potential to lead to power outages throughout a particular area during winter weather events. Power outages can lead to community members not having access to internet or telephone, preventing community members from calling or reaching out for help. Lack of power also creates the potential for community members to lose heat, increasing the need for assistance.

Freezing to below freezing temperatures, ice, and snow may also lead to significant economic impacts. Along with government buildings and services and schools closing, road conditions increase the potential for businesses throughout the potential area to close as well for employees to not reach their place of work. The agriculture industry is particularly prone to the often brief winter weather events in Texas; a week of lower than average temperatures can destroy crops and injure or kill livestock.

Impacts: On December 6, 2011 an ice storm came through North Texas leaving approximately 45,0000 customers throughout North Texas without power due to tree limbs and debris damaging powerlines and associated equipment.[311]

The SHMP describes the economic impact from the 2015 winter storm in North Texas in Lubbock County. The combined economic loss for businesses and commerce was $200 million. Direct losses from the storm were most significant to area ranchers and dairy farmers who suffered combined losses of at least $20 million. The USDA estimated 15,000 head of dairy cattle died from snow suffocation in the Texas Panhandle with similar numbers for non-dairy cattle.[312]

2.6.18.3 *Food, Water, Sheltering*

Risks: Sheltering or warming centers are an essential need during winter weather due to the potential for freezing to below freezing temperatures and power outages. However, the icy road conditions can make traveling to shelters difficult, creating a potential for community members to be uncertain whether they should stay in place or head to shelter.

Sudden power outages, particularly at night, may compound the confusion with community members thinking that they can stay in place, suddenly needing to find a shelter and traveling on hazardous roadways. Homeless individuals are particularly vulnerable to cold weather, with

[311] Courtney Coleman, "Thousands Still Without Power," *NBC News-DFW*, December 8, 2013, https://www.nbcdfw.com/weather/stories/Customers-Without-Power-After-Storm-234760611.html
[312] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 43, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf

individuals not knowing where temporary warming centers are located, or they may think that they can survive for one to two nights in the extreme cold.

Impacts: During the January 2018 winter storm in Houston, shelters saw an increase in those seeking shelter with just one temporary shelter housing 180 individuals in a night; most of the individuals seeking shelter were homeless individuals, but a few were individuals whose furnace quit working.[313] Two deaths were reported during the same cold weather event in Dallas in January 2018; the two individuals who died were homeless—one was found under an overpass and the other individual was found at a bus stop.[314]

2.6.18.4 *Transportation*

Risks: Roadways, especially bridges, are susceptible to icing during winter weather events. When a transportation corridor is iced over, or covered in snow, this creates hazardous driving conditions which effect personal and commercial vehicles. Winter weather can create unpredictable and dangerous driving conditions and all travel is highly discouraged during these events. Aerial travel can also be impacted during winter weather events as visibility becomes limited. The icing of planes and other aircraft, along with runways, only make aerial flight more dangerous during these weather events and can produce cancelled flights. While rare, railroad track switches may also freeze as winter weather can disrupt the distribution of numerous goods and commercial material throughout Texas.

Impacts: February 2015 saw 600 flights cancelled at the Dallas-Fort Worth International Airport due to freezing rain and sleet. During November of the same year, the Dallas/Fort Worth metroplex, along with portions of the Texas Panhandle, experienced troubling ice storms which crippled transportation operations. This severe winter weather event lead to 120 car crashes near Amarillo and numerous semi-trucks jackknifed on Interstate 40 which caused the highway to close for 5 hours.[315] A similar event was seen in February 2015, as the picture below illustrates, winter weather induced wrecks near Amarillo.[316]

[313] Deborah Wrigley, "Warming Center Sees Uptick in People Taking Shelter from Freezing Temperatures," *ABC Eye Witness News*, January 17, 2018, https://abc13.com/warming-center-sees-uptick-in-people-taking-shelter-from-cold/2960410/
[314] Holley Ford, "Two Dead in Dallas After Spending Night in the Cold," *NBC News-DFW*, January 17, 2018, https://www.nbcdfw.com/news/local/2-Dead-in-Dallas-After-Spending-Night-in-the-Cold-469773003.html
[315] *How Vulnerable us Texas' Freight Infrastructure to Extreme Weather Events?*, Texas A&M Transportation Institute, page 82, https://static.tti.tamu.edu/tti.tamu.edu/documents/PRC-16-62-F.pdf
[316] "An icy-dicey mess," *Amarillo Globe-News*, February 23, 2015, https://www.amarillo.com/article/20150223/NEWS/302239677

Figure 2-52: Jackknifed semi-trucks on Interstate 40 near Amarillo, February 2015.[317]

2.6.18.5 *Health and Medical*

Risks: The occurrence of winter weather can present barriers to individuals trying to access health care and medical providers trying deliver care or reach patients who require help and assistance. Physical access to health care and medical providers is the main concern, as frozen precipitation can make roadways unsafe and potentially deadly to travel on for personal vehicle travel, public transit, and medical transport vehicles.[318] Rescue missions may also be impacted by low-visibility and the potential of freezing mechanical equipment. As ice or snow accumulates on power lines, hospitals and other medical provider facilities can face power outages or blackout situations, potentially putting the lives of patients in life-threatening danger. Depending on the amount of snowfall or ice accumulation, hospitals may also need to turn their operations into what is best described as a hotel, as high numbers of hospital staff may be required to live at the hospital if they are unable to leave due to road conditions.[319]

[317] Photography by *Amarillo Globe News*, February 23, 2015, https://www.amarillo.com/article/20150223/NEWS/302239677
[318] Eric Allen Conner, "Overcoming Winter Weather's Barriers to Healthcare," *Healthily*, February 25, 2016, https://www.healthify.us/healthify-insights/overcoming-winter-weathers-barriers-to-healthcare
[319] "Emergency planning: Preparing for a winter storm," Hospital Safety Center, January 5, 2017, http://www.hospitalsafetycenter.com/details.cfm?content_id=328679&topic=WS_HSC_BHS

Impacts: Since 2011, Texas has been the eighth most deadly state in the nation, and the first most deadly state in the southern portion of the U.S., for winter weather vehicle accidents.[320] The SHMP specifically presents the story of two individuals who, while traveling in a car on December 27, 2015, lost their lives due to a combination sleet, snow, and freezing rain covered roads around Lubbock. During this same winter weather event in the Texas Panhandle, medical personnel and other first responders conducted rescue missions for motorists who had been stuck in their vehicles for up to 32 hours due to snow drifts that blocked roads.[321]

Figure 2-53: Vehicles stuck in snowdrifts near Amarillo during February 2013 blizzard.[322]

2.6.18.6 *Hazardous Material (Management)*

Risks: Winter weather, and the association of freezing temperatures, can cause disruption, malfunction, and other consequences to refinery processes, infrastructure, and other facilities that may be required in handling potentially hazard material and or waste. The transporting of hazardous material can also be put into risk, as winter weather can make roadways treacherous which can lead to spills and other accidents. Hazmat response teams can also be hindered, as roadway access is needed for their arrival. Snow, ice, and sleet can also make trains more

[320] Doyle Rice, "Winter car accidents are a deadly weather hazard," *USA Today*, February 6, 2017, https://www.usatoday.com/story/weather/2017/02/06/winter-fatal-car-accidents/97551588/
[321] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 43, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[322] Photography by Amarillo National Bank, National Weather Service, February 25, 2013, https://www.weather.gov/ama/feb25blizzard

susceptible to derailments and cause hazardous material spills, depending on what the train is transporting. While the presence of snow can limit the spread of leaked material, as the snow may initially act as a barrier, continued snow fall can also cover up spills and other waste leaks which can limit the ability of response crews to find further spills.[323]

Impacts: During winter weather events, all forms of transportation can be treacherous due to slippery conditions and visibility concerns. Train derailments across the nation also appear to be more common during high accumulation times of snow and ice.

2.6.18.7 *Energy (Power & Fuel)*

Risks: Widespread power outages can result from snowfall and ice accumulation. Depending on the amount of snow or ice, transmission lines can be weighed down to a point where they collapse and are left in a state of needed repair. Further, snow, ice, and other winter weather accumulation can weigh down tree branches, causing them to snap and fall on top of above ground energy infrastructure which can leave people without electricity for an extended period of time. Winter weather can also limit the physical access people have in order to reach gas and other fueling stations. The same can be said for the transportation and delivery of fuel to gas stations as roads can become impassable and unsafe to drive on. When winter weather effects roadways, oil refineries and other fuel production sectors, there may be reduction in the demand for their products, as vehicle use falls if roads cannot be used or accessed in a safe manner.[324] Winter weather accumulation, due to the potential of power outages, can affect homes, businesses, and schools..

Impacts: During an ice storm in the Dallas/Fort Worth metroplex in December 2013, Oncor estimated that 500,000 customers lost power in the area. This loss of power was and remains one of the company's largest power outages in North Texas' power line network.[325]

[323] "Spill Cleanup in Adverse Weather Conditions," Protect Environmental Services Inc., http://www.protectusa.net/spill-cleanup-in-adverse-weather-conditions/
[324] Suzanne Danforth and Amanda Fairfax Dirkes, "Freezing Temperatures Disrupt Refinery Operations & Products Demand Across PADD 3," *Genscape*, January 18, 2018, https://www.genscape.com/blog/freezing-temperatures-disrupt-refinery-operations-products-demand-across-padd-3
[325] "Ice Storm Power Outages Leave Questions," *Dallas Morning News*, February 5, 2011, https://www.dallasnews.com/business/energy/2013/12/15/ice-storm-power-outages-leave-questions/

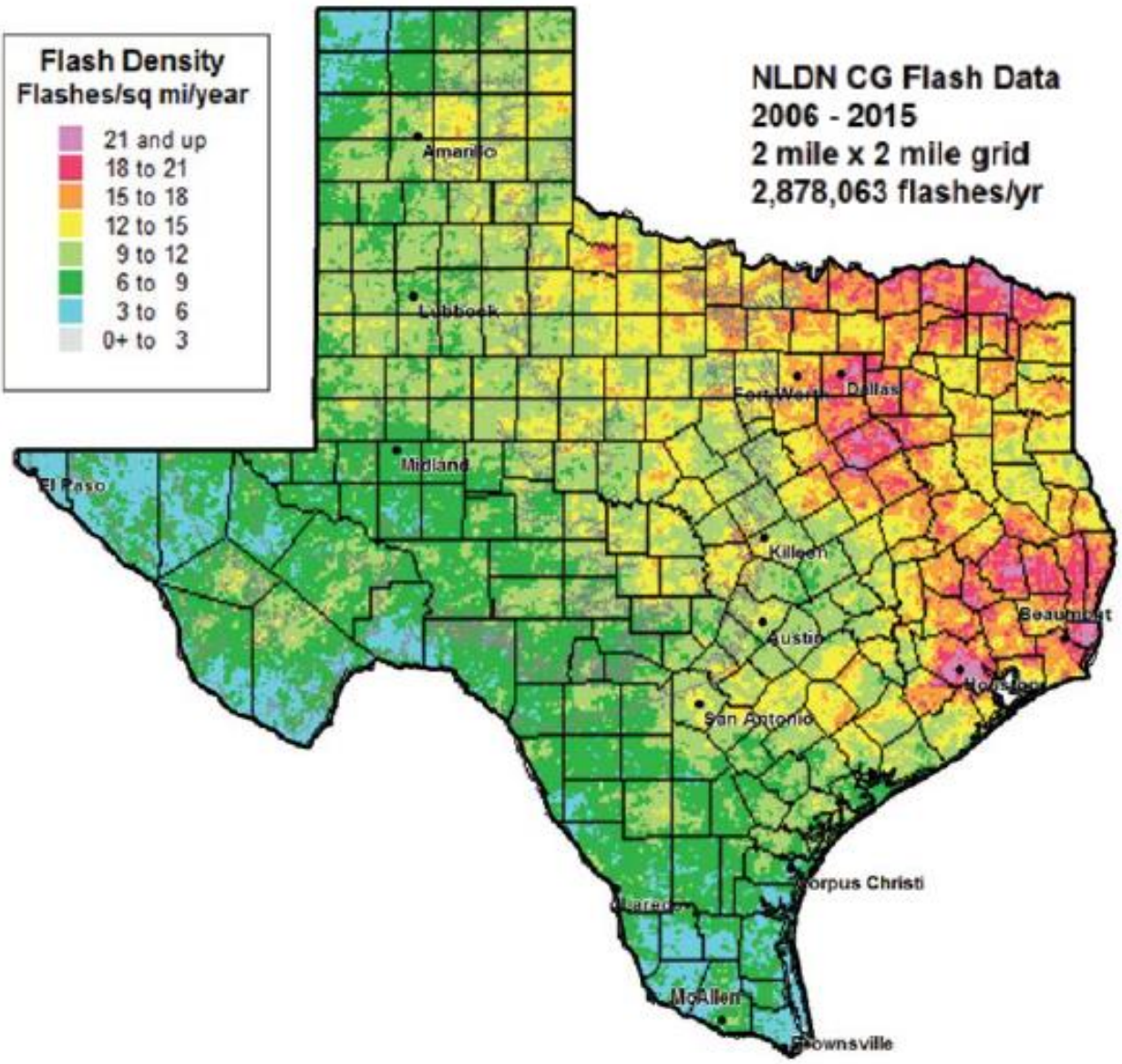
Figure 2-54: Downed power line during the 2013 ice storm in Paris, Texas.[326]

[326] "North Texas Winter Storm: December 5-7th 2013," National Weather Service, NOAA, https://www.weather.gov/fwd/december72013

2.6.19 LIGHTNING

The SHMP defines lightning as a massive electrostatic discharge between electrically charged regions within clouds, or between a cloud and the earth's surface. The SHMP identifies the Houston and Beaumont/Port Arthur areas, along with the Dallas-Fort Worth metroplex, as the most vulnerable when it comes to lightning strikes. The following NLDN CG Flash Data map presents the location of lightning strikes in Texas from 2005–2016.

Figure 2-55: Locations of lightning strikes in Texas (2005-2016)[327]



[327] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 196, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf

The annual average financial loss due to lightning in Texas is $3,234,744, making this hazard the tenth most financially costly in the state. The SHMP notes that from 2018–2023, it is forecasted that lightning will account for $17,560,332 in property losses, $269 in crop losses, 15 fatalities, and 64 injuries.

The National Lightning Safety Institute defines the different types of lightning, presented in the following table and in the SHMP.[328]

Table 2-8: Forms of Lightning

Forms of Lightning	
Lightning Form	Definition
Direct Strike	This is the most dangerous hazard, wherein the person or structure is in a direct path for lightning currents. The magnitude of the current determines its effects. A typical amperage of 2OkA acting on a ground of 10 ohms creates 200,000V. A large strike can attain l5OkA levels. More than 50 volts will drive a potentially lethal current through the body.
Side Strike	This hazard results from the breakup of the direct strike when alternate parallel paths of current flow into the ground via a person or structure. When the initial current path offers some resistance to current flow, a potential above-ground current develops and the person or structure's resistance to ground becomes the alternate path of conduction.
Conducted Strike	This hazard occurs when lightning strikes a conductor which in turn introduces the current into an area some distance from the ground strike point. Unprotected connected equipment can be damaged, and personnel injured if they become an indirect path in the completion of the ground circuit.
Structure Voltage Gradient	Current passing through two or more structures creates a momentary voltage differential. Poor interconnect bonding may cause a completed circuit potential difference. The same hazard is created, for example, by a person touching an ungrounded object while he or she is grounded. The electrical circuit is completed through the person, sometimes with fatal consequences.
Induced Effects	Lightning can induce electric field and magnetic field coupling into structures and into wiring. Magnetic coupling is transformer action, and the common laws for transformers prevail.

[328] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 195, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf

Forms of Lightning	
Lightning Form	Definition
Steamer Conductor	The streamer hazard occurs when a lightning leader influences electric behavior of objects on the Earth. Even streamers which do not become a part of the main channel can contain significant amounts of current. Streamer current exposure can affect people and sensitive electronics.
Sequelae	These secondary effects are many. Forest and grass fires, explosive steam conditions in masonry, trees and other water-bearing objects, and consequences of the thunder clap startling a person into inadvertently throwing a switch are examples.
Step Voltage/Touch Voltage	This hazard occurs as a result of a lightning strike dissipating its energy through the ground. The ground current creates a voltage drop across the surface of the Earth. A person standing within several hundred feet from the lightning strike point can have several hundred volts generated between his or her feet. This hazard is identical to a person being grounded while touching two live wires, one with each hand.

2.6.20 FEMA's Community Lifelines for Lightning

2.6.20.1 *Safety and Security*

Risks: Lightning can accompany a variety of other hazards including hurricanes, severe thunderstorms, flood events, extreme heat, and wildfires, and accordingly is associated with all of risks posed by these hazards. Lightning on its own may significantly impact the safety and security of first responders and impact government buildings and services. Lightning striking buildings or homes or other infrastructure has the capacity to start fires which can spread to surrounding areas. If lightning occurs in conjunction with a severe thunderstorm, there is the potential for a flooding event to occur along with fires. High flood waters or debris in roadways from heavy winds may block or hinder first responders from getting to the fire.

Impacts: There are several recent incidents of first responders injured trying to save community members and homes from fires started by lightning. For example, during August 2018, three first responders in Frisco, Texas were injured fighting a house fire started by lightning.[329] Similarly, two deputies were treated for smoke inhalation after running into a house fire started by lightening in Harris County on June 29, 2019. On July 10, 2019, lightning caused a house fire in Irving, Texas; two firefighters were treated for heat exhaustion.[330]

[329] "3 First Responders Injured Battling Frisco House Fire" *CBS Local News*, August 9, 2018, https://dfw.cbslocal.com/2018/08/09/first-responders-injured-frisco-house-fire/
[330] "Lightning strikes blamed for house fires in Flower Mound, Irving," *Fox 4 News*, July 10, 2019, https://www.fox4news.com/news/lightning-strikes-blamed-for-house-fires-in-flower-mound-irving

2.6.20.2 *Communications*

Risks: Lighting can cause trees to topple into powerlines, hit power poles or related equipment directly, or lead to fires near powerlines, all with the potential to cut of power. The lack of power due to a lightning strike may compound issues related to another hazard's communication risks.

House or other infrastructure fires require a quick response; this may lead to first responders or neighbors trying to get into the building to save individuals trapped inside or tell the community members that the building is on fire. Confusion may ensue during such events, as first responders may not know who is left inside.[313]

Impacts: Miscommunication or confusion may lead to an increase in injuries or death of first responders or community members.

2.6.20.3 *Food, Water, Sheltering*

Risks: Finding a safe shelter during a lightning event is a common source of confusion for community members. Community members, especially during thunderstorms, may try to seek shelter under trees, tents or pavilions to keep dry during a thunderstorm/lighting event.[331, 332] However, these areas are not suitable, and are often more dangerous, than being out in the open during lightning. Individuals may assume that they have more time to find shelter than they actually do or assume that if the rain has stopped during a thunderstorm there are no longer safety issues.

Impacts: Confusion of where to go during lighting events has the potential to increase accidents, injuries or deaths associated with lightning strikes. A roofer was in critical condition after he was struck by lightning during a thunderstorm on June 2, 2019. The roofer came inside during the rain but went back on the roof after the rain subsided when he was struck by lightning.[333] In 2017, a man was killed by lightning in Midland, Texas sitting on a cinder block wall; he reportedly said "Oh it won't strike here" right before he was struck.[334]

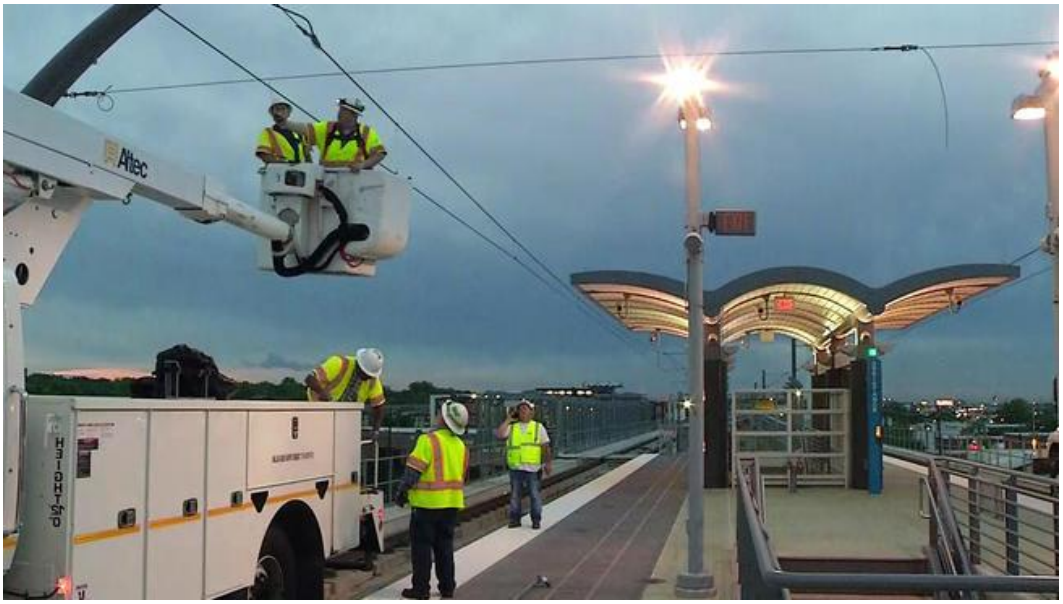
[331] "Lightning FAQ," Centers for Disease Control, https://www.cdc.gov/disasters/lightning/faq.html
[332] "Is your 'shelter' from the storm a lightning safe place? Reminders about the dangers of tents and thunderstorms," *Lightning Protection Institute*, https://lightning.org/is-your-shelter-from-the-storm-a-lightning-safe-place-reminders-about-the-dangers-of-tents-and-thunderstorms/
[333] "Incident Data," *Struck by Lightning*, http://www.struckbylightning.org/news/dispIncidentdb.cfm
[334] Stephanie Bennett, "Family of Midland lightning victim speak and a warning for others Lightning fatally strikes man," *CBS 7 News*, July 4, 2017, https://www.cbs7.com/content/news/Family-of-Midland-lightning-victim-speak-and-a-warning-for-others-432533303.html

2.6.20.4 *Transportation*

Risks: During a thunderstorm, lightning has been known to strike trees and cause branches and limbs to fall and block roadways and other transportation access points. Lightning strikes can also impact traffic control systems and other operations and maintenance aspects of the transportation network. Lightning strikes can affect these systems by either striking them or causing power outages in the immediate area. This can lead to traffic delays, traffic signals not functioning properly, pedestrian beacons being out of service, public transportation options being limited, and others. While the majority of airplanes and other aerial transportation devices are designed to handle lightning strikes, some crashes can be attributed to lightning.[335] Lightning can also affect traffic control devices, different safety controls at airports, and general situational awareness and route options for pilots.

Impacts: As storms rolled into the Dallas-Fort Worth metroplex on May 11, 2016, lightning struck near the Dallas Area Rapid Transit's (DART) station in downtown Carrollton. DART reported that two of its trains, along with necessary electrical equipment, were damaged.[336] This lightning event limited DART's public transportation capacity for several days after the event.

Figure 2-56: Crews work to repair the Carrollton DART rail line damaged by lightning.[337]



[335] *Extreme weather impacts on transport systems 2011*, VTT Technical Research Centre of Finland, page 25, https://www.vtt.fi/inf/pdf/workingpapers/2011/W168.pdf
[336] "Lightning strike blamed for damage at Carrollton DART station," *Fox 4 News KDFW*, May 12, 2016, https://www.fox4news.com/news/lightning-strike-blamed-for-damage-at-carrollton-dart-station
[337] Todd L. Davis, "Carrollton DART Rail Reopens After Lightning Strike," *NBC DFW*, May 13, 2016, https://www.nbcdfw.com/news/local/DART-Rail-Shut-Down-in-Carrollton-After-Lightning-Strike-379154291.html

2.6.20.5 *Health and Medical*

Risks: The SHMP notes that lightning can cause injury and death throughout Texas. Most lightning deaths and injuries that people sustain are at golf courses, standing under trees, or near water, according to the National Weather Service.[338] Depending on the type of lightning strike, the severity of injury varies case by case. The deadliest type of lightning strike—direct strikes—account for roughly 5 percent of lightning injuries. Ground current (50 percent), side flash (30 percent), and conduction (15 percent) strikes account for the rest of injuries attributed by lightning strikes.[339]

Impacts: On August 26, 2014, in Bee Cave, 3 children were injured by a lightning strike during soccer practice at the Lake Travis Youth Association Field of Dreams. Witnesses to the accident told reporters that there was no indication of lighting, as there were no storms in the area and the sky was fairly clear.[340] From 2008–2017, there were 20 lightning fatalities in Texas, the second highest number of lightning attributed deaths in the United States, behind Florida.[341] From 1996 to 2016, lightning accounted for 5 percent of hazard-related deaths in Texas, tied with hurricanes, tropical storms, and depressions during the presented time period.[342]

2.6.20.6 *Hazardous Material (Management)*

Risks: Lightning strikes can cause a great deal of damage and destruction to storage facilities and other structures that house hazardous materials and/or waste. If an explosion occurs, hazardous material can be scattered throughout an area and expose itself to human and environmental health functions. Even if the hazardous material does not physically reach an area on ignition or explosion, the possibility of the explosion placing these materials into a waterway can create effects felt downstream. If a fire occurs, the fumes from the fire can be lifted and carried across miles of land and, therefore, reach households and businesses which were not in the immediate vicinity of the lightning strike.

Impacts: On May 22, 2018, lightning struck and ignited a tank battery—a group of tanks connected to receive crude oil production from a nearby well or production lease that is then measured and tested before moving through the pipelines—near Hallsville. As a consequence of the oil fuel fire,

[338] "Lightning," National Weather Service, NOAA, accessed October 4, 2019, https://www.weather.gov/hgx/severe_weather_awareness_lightning
[339] "Lightning Safety 101," Center for Wilderness Safety, https://www.wildsafe.org/resources/outdoor-safety-101/lightning-safety-101/lightning-injuries/
[340] Ashley Gou, "EMS: Three children injured by lightning strike," *KVUE News,* August 26, 2014, https://www.kvue.com/article/news/local/ems-three-children-injured-by-lightning-strike/269-260153303
[341] "Lightning Victims," National Weather Service, accessed October 4, 2019, https://www.weather.gov/safety/lightning-victims
[342] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 92, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf

7 nearby acres caught on fire.[343] On March 28, 2018, two oil tanks in Burleson County were struck by lightning; causing an explosion and fire. The fires were contained, but the fumes associated with the explosion and fire put nearby homes and businesses at risk.[344]

Figure 2-57: Lightning ignited oil tanks in Burleson County in 2018.[345]

2.6.20.7 *Energy (Power & Fuel)*

Risks: During a lightning event, electric equipment with power lines and at substations can be struck, causing power outages for extended periods of time. Lightning can also hit trees and other structures that may, in turn, fall onto utility infrastructure and cause power outages. Lightning strikes traveling through household and commercial devices can also cause fires if they are plugged into an outlet. Using surge protectors, or unplugging appliances and electronics during lightning events, can drastically reduce this from happening.[346]

Impacts: On June 5, 2019, the city of College Station reported that a 138kV tie switch, located at a substation, had been struck by lightning. This lightning strike caused the substation to lose its ability to provide power to 8,770 customers.[347]

[343] Ken Hedler, "Lightning strike ignites tank battery near Hallsville," *Longview News-Journal*, May 23, 2018, https://www.news-journal.com/news/police/lightning-strike-ignites-tank-battery-near-hallsville/article_c7c752fa-5e99-11e8-b332-23f9ee5727e2.html
[344] Blakeley Galbraith, "Oil tank explodes in Burleson County after lightning strike," *KBTX-TV*, March 28, 2018, https://www.kbtx.com/content/news/Oil-tank-explodes-in-Burleson-County-after-lightning-strike-478215323.html
[345] Photography by Blakeley Galbraith, *KBTX-TX*, March 28, 2018, https://www.kbtx.com/content/news/Oil-tank-explodes-in-Burleson-County-after-lightning-strike-478215323.html
[346] "Power Fluctuations," CoServ, accessed October 4, 2019, https://www.coserv.com/Energy-Solutions/Reliability/Power-Fluctuations
[347] Kasey Tucker, "Storm causes power outages across College Station," KBTX-TV, June 5, 2019, https://www.kbtx.com/content/news/Storm-causes-power-outages-across-College-Station-510855431.html

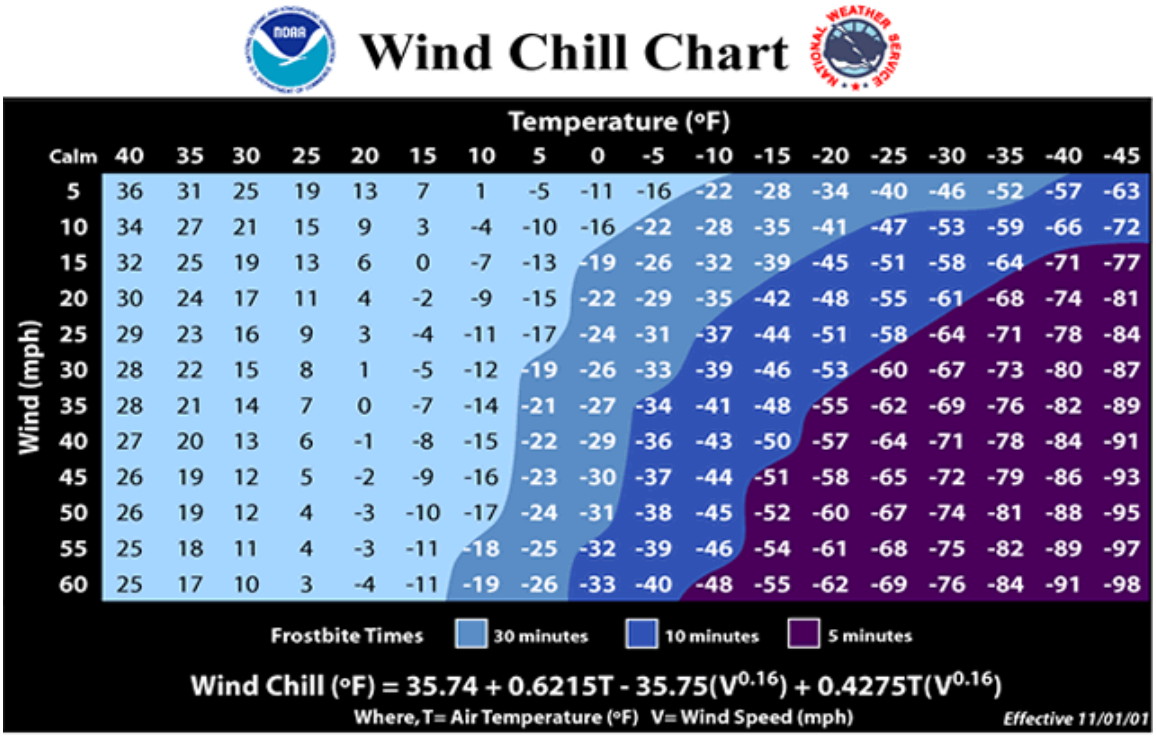
2.6.21 Extreme Cold

The SHMP predicts that the number of days with maximum temperatures above freezing (32°F) throughout Texas are expected to decrease over time and will lead to a reduction in annual cold weather events every year. While extreme cold can happen anywhere in Texas, the Panhandle and other northern portions of the state experience the majority of extreme cold temperatures. In the Panhandle, extreme cold means days below 0°F, while in the Rio Grande Valley it means reaching temperatures below freezing.

The SHMP notes that from 2018–2023, it is forecasted that extreme cold will account for $2,972,052 in property losses, $514,705 in crop losses, 4 fatalities, and 1 injury.

The SHMP also notes that when dealing with extreme cold, the wind-chill effect is important to consider. The wind chill temperature is a measurement of how cold the wind makes the air feel to the human body. Since wind can dramatically accelerate heat loss from the body, a 30°F day could feel just as cold as a calm day with 0°F temperatures. Provided by the National Oceanic and Atmospheric Administration, the following chart depicts wind chill dependent on temperatures, wind speed, and exposure in minutes.[348]

Figure 2-58: NOAA Wind Chill Chart



[348] "Wind Chill Chart," National Weather Service, NOAA, accessed October 4, 2019, https://www.weather.gov/safety/cold-wind-chill-chart

2.6.22 FEMA's Community Lifelines for Extreme Cold

2.6.22.1 *Safety and Security*

Risks: Similar to winter weather, inexperience with extreme cold has the potential for Texans to be unprepared for the cold and its associated risks. Community members may not have additional clothing or household items such as heavier coats, boots, or blankets. Additionally, community members may not understand how to prepare for extreme cold such as leaving faucets dripping, properly maintaining space heaters, or bringing pets inside. Extreme cold events are often short lived in Texas as well; this has the potential to exacerbate risks, as community members may not want to invest in heavier coats or boots because they may think that the extreme cold will quickly dissipate. Some community members cannot afford to purchase heavier coats, boots, or other extreme cold essentials.

These assumptions and lack of understanding of how to prepare creates the potential for an increase in accidents and injuries, necessitating first responders to go out in to extreme cold and potential icy roads to respond to these events. Cold weather may also increase the likelihood of equipment malfunctions, such as fire hydrants frozen shut or frozen ladders and hoses; these malfunctions may all create the potential for further injury or accidents to community members or first responders.[349]

Impacts: In 2018, communities throughout Travis County saw temperatures below 28°F with icy roadways. These conditions led to several accidents throughout the area with one reported fatality. Major traffic delays were reported across the county. In addition to asking drivers to stay off the roads or slow down on roadways, TxDOT reminded drivers to slow down for crews on the road.[350]

2.6.22.2 *Communications*

Risks: Similar to extreme winter weather events, extreme cold may lead to power outages or brownouts due to the constant need for heat. Power outages impair residents' ability to call for help if they are in danger. Also, first responders may be overwhelmed with calls that the electricity has gone out—having less capacity to address life threating accidents or issues in the community.[351] Since extreme cold is associated with extreme winter weather, there is the potential for icy road conditions or debris such as fallen tree limbs in the roadway. This may hinder first

[349] Colleen Long and Carolyn Thompson, "For Firefighters, Bitter Weather Creates its Own Hazards," *AP News*, January 7, 2018, https://www.apnews.com/ad2994834d9046969e69336fe5b1c417
[350] Tony Cantu, "Icy Road Conditions in Austin Spark Accidents, Road Closures," *The Patch*, January 2, 2018, https://patch.com/texas/downtownaustin/icy-road-conditions-austin-spark-accidents-road-closures
[351] "Don't call 911 to report a power outage unless there's an actual emergency," *Valley News*, June 28, 2017, https://www.valleynewslive.com/content/news/Dont-call-911-to-report-a-power-outage-unless-theres-an-actual-emergency-431400583.html

responders from getting to community members in a timely fashion or may prevent them from reaching a community member.

Impacts: In 2018, over 20 counties in East Texas saw widespread power outages along with extreme cold, with over 20,000 reported outages. Harrison, Panola, Marion, Morris, Rusk, and Shelby Counties saw the majority of outages in East Texas during this event.

2.6.22.3 *Food, Water, Sheltering*

Risks: Sheltering or warming centers are an essential need during winter weather and extreme cold due to the potential for freezing temperatures and consequential power outages. Sudden power outages, particularly at night, may compound the confusion among community members thinking that they can stay in place, and suddenly realizing the need to find a shelter. Homeless individuals are particularly vulnerable to cold weather; however, homeless individuals may not know where temporary warming centers are located, or they may think that they can survive for one to two nights in the extreme cold.

Impacts: During the January 2018 winter storm in Houston, shelters saw an increase in those seeking shelter, with just one temporary shelter housing 180 individuals in a night; most of the individuals seeking shelter were homeless individuals, but a few were individuals whose furnace quit working.[352] Two deaths were reported during the same cold weather event in Dallas in January 2018; the two individuals who died were homeless—one was found under an overpass and the other individual was found at a bus stop.[353]

2.6.22.4 *Transportation*

Risks: While cold weather extremes in Texas are relatively rare and mild when compared to other portions of the country, there are a variety of transportation-related impacts that can be attributed to extremely cold temperatures. Extreme cold temperatures can present challenges which impact transportation operational systems, safety of transportation network users, airport closures and delays, equipment malfunctions, the potential for frozen fuel lines, and impacts to logistical schedules.[354] Diesel and gasoline-powered engines may have to work harder and lead to more strains on the vehicles they are powering, as vehicle batteries can also become stressed. The fuel being used in vehicles can, if temperatures fall low enough, become a gel-like substance that can

[352] Deborah Wrigley, "Warming center sees uptick in people taking shelter from freezing temperatures," *Channel 13 Eye Witness News*, ABC, January 17, 2018, https://abc13.com/warming-center-sees-uptick-in-people-taking-shelter-from-cold/2960410/
[353] Holley Ford, "Two Dead in Dallas After Spending Night in the Cold," NBCDFW.com, January 17, 2018, https://www.nbcdfw.com/news/local/2-Dead-in-Dallas-After-Spending-Night-in-the-Cold-469773003.html
[354] "Transportation Systems' Resilience to Extreme Cold Weather," Transportation Association of Canada, January 26, 2015, https://www.tac-atc.ca/en/transportation-systems-resilience-extreme-cold-weather

inhibit personal and commercial travel on roadways and rail lines. Extremely cold temperatures can also stress metal bridges and other hardened infrastructure on the transportation network.[355]

Impacts: In February 2011, during the events of Super Bowl XLV held at the AT&T Stadium in Arlington, freezing temperatures swept across the Dallas-Fort Worth metroplex. It was reported that 4 inches of ice and sleet fell in Arlington and, near the Dallas-Fort Worth International Airport in Grapevine, below-freezing temperatures stayed in the area for over 100 consecutive hours. At the airport, it was reported that flights were cancelled, numerous pipes froze, and ice sheets fell from overhangs and onto the airport's monorail system.[356]

Figure 2-59: Snow and ice covered AT&T Stadium in Arlington, February 2011.[357]

2.6.22.5 *Health and Medical*

Risks: Extremely cold temperatures can pose a number of public health problems. Frostbite, hypothermia, heart problems, and other issues are common occurrences throughout times of low

[355] Christopher R. Adams, "Impacts of Temperature Extremes," Cooperative Institute for Research in the Atmosphere, Colorado State University, accessed October 4, 2019, https://sciencepolicy.colorado.edu/socasp/weather1/adams.html
[356] "How Vulnerable us Texas' Freight Infrastructure to Extreme Weather Events?" Texas A&M Transportation Institute, March 2017, page 23, https://static.tti.tamu.edu/tti.tamu.edu/documents/PRC-16-62-F.pdf
[357] Photography by Louis DeLuca and Mark Francescutti, *Dallas Morning News*, December 24, 2012. https://www.dallasnews.com/arts-entertainment/2012/12/25/a-white-christmas-dallas-officials-preparing-for-snow/

temperatures.[358] During cold spells, people also spend more time indoors and within close contact of other individuals, helping to spread illnesses such as colds, the flu, and respiratory illness.[359] The use of generators, or other gasoline-powered tools, to supplement the heating of a home, business, or other structure needs to be closely monitored and ventilated properly during use as these machines produce carbon monoxide. Carbon monoxide deteriorates a person's blood's capability to deliver oxygen to body tissues and organs; it cannot be smelled or seen, so people often do not know that they are breathing in the gas in and fatal poisoning can happen within minutes.[360]

Impacts: According to the University of Texas Health Science Center at Houston (UTHealth) School of Public Health, across Texas' 12 major metro areas from 1990 to 2011, cold temperatures were found to increase the risk of mortality by 5 percent per every 1-degree Celsius decrease of temperature in winter months. The highest percentage increase of mortality was seen in the Gulf Coast region, which saw risks increasing 3–8 percent dependent on the exact area. [361]

2.6.22.6 *Hazardous Material (Management)*

Risks: During extreme cold events, the storage of chemicals and other hazardous material is sometimes an overlooked process. Within their storage containers, chemicals expand when they drop below their freezing point, which increases the probability that their container will rupture. If a container ruptures and leaks material, severe safety issues arise, and the spill must be cleaned up correctly and quickly. Damage to the actual substance being held can also occur, as extreme cold can make chemicals more difficult to use.[362] Proper storage of hazardous chemicals, especially during extreme cold events, can prevent individuals, the environment, and other functions from exposure to corrosive and other harmful contaminants.

Impacts: In January 2018, days of frigid temperatures swept across south and southeast Texas. As a result, oil refineries in Baytown and Corpus Christi were affected by the cold weather which led these locations to experience malfunctions, process abnormalities, and necessary flaring which can

[358] Shawn Radcliffe, "How Extreme Cold Weather Can Affect Your Health," *Healthline*, January 29, 2018, https://www.healthline.com/health-news/how-extremely-cold-weather-can-affect-your-health#1
[359] "How does cold weather affect your health?" Harvard Health Publishing, Harvard Medical School, November 2014, https://www.health.harvard.edu/staying-healthy/how-does-cold-weather-affect-your-health
[360] "Carbon Monoxide and Generators," Texas Department of State Health Services, May 20, 2015, https://www.dshs.state.tx.us/preparedness/factsheet_co2-generators.shtm
[361] Tsun-Hsuan Chen, Xiao Li, Jing Zhao, Kai Zhang, "Impacts of cold weather on all-cause and cause-specific mortality in Texas, 1990–2011," *Environmental Pollution*, Volume 225, June 2017, pages 244-251, https://www.sciencedirect.com/science/article/pii/S0269749116317213?via%3Dihub
[362] "Safe Chemical Storage in Cold or Freezing Weather," Safety Storage Systems, accessed October 4, 2019, https://safetystoragesystems.co.uk/blog/chemical-storage-cold-weather/

signal unplanned operations interruptions.[363] While no hazardous materials were released, there is a heightened risk of potential for these types of hazards during severe cold temperatures outbreaks.

2.6.22.7 *Energy (Power & Fuel)*

Risks: When temperatures reach extremely cold levels, the electric grid strains to keep up with the energy demands that are placed upon it. This strain is pushed further when aging electric infrastructure is being utilized. Severe cold temperatures can interfere with how certain mechanisms are able to operate, such as hydraulic lines, electromechanically support equipment, and sensors.[364] Severe cold temperatures can disrupt oil refineries and other energy production operations throughout Texas as well. These locations, in Texas, are not as well equipped to handle cold snaps when compared to those located in colder parts of the country.

Impacts: During an extreme cold-snap throughout Texas in 2011, rolling blackouts were imposed for only the second time in the history of the state. The cold temperatures shut down 7,000 megawatts of power generators, about 8 percent of the installed capacity in Texas at the time. These blackouts impacted numerous homes and local businesses. Overall, it was reported that 1 million homes were left without power for up to an hour with local schools and businesses having to close as well.[365]

[363] Suzanne Danforth and Amanda Fairfax Dirkes, "Freezing Temperatures Disrupt Refinery Operations & Products Demand Across PADD 3," Genscape, January 18, 2018, https://www.genscape.com/blog/freezing-temperatures-disrupt-refinery-operations-products-demand-across-padd-3
[364] Erich Gunther, "Why Does the Power Go Out When It's Cold?" *National Geographic*, January 23, 2014, https://www.nationalgeographic.com/environment/great-energy-challenge/2014/why-does-the-power-go-out-when-its-cold/
[365] Chris Baltimore, "Texas weathers rolling blackouts as mercury drops," *Reuters*, February 2, 2011, https://www.reuters.com/article/us-ercot-rollingblackots/texas-weathers-rolling-blackouts-as-mercury-drops-idUSTRE7116ZH20110202

2.6.23 Extreme Heat

Extreme Heat is a concern for all regions of Texas as this hazard is defined as a combination of very high temperatures and exceptional humid conditions. While Extreme Heat has not recently been directly attributed to a disaster declaration in Texas, Extreme Heat has led to Drought and Wildfire.[366] The SHMP notes that Houston, Dallas, and Austin have all seen an increase in the annual number of days above 100°F since 1970. Texas currently averages more than 60 dangerous heat days a year; by 2050, the state is projected to see 115 such days a year, second only to Florida. In Texas, Extreme Heat leads to an average annual dollar loss of $39,276.[367]

The SHMP notes that from 2018-2023, it is forecasted that extreme heat will account for $78,232 in property losses, $115,212 in crop losses, 105 fatalities, and 280 injuries.

2.6.24 FEMA's Community Lifelines for Extreme Heat

2.6.24.1 *Safety and Security*

Risks: Extreme heat is also associated with drought and wildfire. Consequently, all of the risks associated with these hazard types are also associated with extreme heat. Extreme heat has the potential to exasperate these risks as well. If first responders are trying to fight a wildfire during an extreme heat event there is the increased potential for heat stroke or other injuries.

Extreme heat itself poses risks to first responders. Community members who have been exposed to extreme heat may react by becoming more irritable or increase their consumption of alcoholic beverages to cool down, leading to dangerous confrontations with first responders. [368, 369] Additionally, first responders themselves do not have the option of staying inside during heat events; they are constantly outside, often in dark and heavy uniforms and carrying heaving equipment outside during extreme heat, which can lead to dehydration, heat exhaustion, and heat stroke.[214]

Impacts: On August 25, 2019, two firefighters were treated for heat exhaustion while addressing an apartment fire in Arlington; the heat index, at 105°F, and heavy equipment were both blamed

[366] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 44, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[367] Ibid, page 58, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[368] James Hartley, "First responders also have to deal with the Texas summer heat. Here's how they cope," *Fort Worth Star-Telegram*, July 8, 2019, https://www.star-telegram.com/news/local/fort-worth/article232073487.html
[369] Steven Sarabia, "High temperatures bring high number of heat-related emergencies," Fox 7 Austin, June 19, 2019, http://www.fox7austin.com/news/local-news/high-temperatures-brings-high-number-of-heat-related-emergencies

for their injuries.[370] Similarly, in Houston on May 17, 2019 two firefighters were treated for heat exhaustion trying to contain an apartment fire.[371] In Jefferson County, Texas on August 9, 2019 fire crews had to battle a storage shed fire in addition to a heat index of 105°F; this incident had no reported injuries largely because of the number of crew members, allowing for a team to go in while another team cooled off. First responders reportedly noted that if they did not have additional help that battling the fire would have been a "nightmare".[372]

2.6.24.2 *Communications*

Risks: Similar to extreme cold or winter weather events, extreme heat may lead to power outages or brownouts due to the need for constant air conditioning.[373,374] Power outages can prevent individuals from calling emergency services for assistance. Also, first responders may be overwhelmed with calls that the electricity has gone out—having less capacity to address life-threating accidents or issues in the community.[375]

Impacts: A lack of communication and power have the potential to increase accidents, injuries, deaths, and financial loss for Texas communities.[376]

2.6.24.3 *Food, Water, Sheltering*

Risks: Extreme heat is often associated with drought and wildfires. Consequently, the risk associated with these hazards have the potential to occur with extreme heat. Extreme heat, similar to drought, may have a significant impact on agriculture production throughout the state. In addition to the potential loss of crops, there is the potential for loss of productivity; farmers and all agricultural workers may have fewer hours in the day to work outside during extreme heat events and may have to work earlier in morning to avoid the heat.[377] Dairy production decreases

[370] "2 Firefighters Treated for Heat Exhaustion Following Arlington Apartment Fire," CBS DFW, August 25, 2019, https://dfw.cbslocal.com/2019/08/25/2-firefighters-treated-for-heat-exhaustion-following-arlington-apartment-fire/
[371] "2 firefighters treated for heat exhaustion from 4-alarm fire near Galleria area," KHOU 11, May 17, 2019, https://www.khou.com/article/news/local/2-firefighter-treated-for-heat-exhaustion-from-4-alarm-fire-near-galleria-area/285-3da4a1ad-61b7-4db3-a632-45390125097c
[372] Eleanor Skelton and Tyler Seggerma, "Firefighters battle extreme heat, humidity during barn fire near Highway 90," 12 News, KBMT-TV, August 9, 2019, https://www.12newsnow.com/article/news/local/firefighters-battle-extreme-heat-humidity-during-barn-fire-near-highway-90/502-cdab9f55-dda1-47d2-9a45-7b7c38e185a9
[373] "Thanks To the Heat, Texas Power Grid Breaks All-Time Record," KERA News, *Associated Press,* August 6, 2015, https://www.keranews.org/post/thanks-heat-texas-power-grid-breaks-all-time-record
[374] Ken Kalthoff, "Rolling Summer Power Outages Possible with Record Texas Demand Forecast," NBCDFW.com, NBC Universal Media, May 15, 2018, https://www.nbcdfw.com/news/local/Rolling-Summer-Power-Outages-Possible-With-Record-Texas-Demand-Forecast-482724201.html

[377] Scott Waldman, "Precarious Life of Texas Farmworkers Becomes Riskier with Warming," E&E News, *Scientific American,* April 23, 2018,

during extreme heat events with livestock producing lower quantities and quality milk.[378] This may lead to significant economic loss for the state as well as lower the quantity and quality of food over time.

Along with the quality of agricultural products, water quality may be impacted as well. Increased temperatures lead to lower levels of dissolved oxygen in waterways harming fish and other aquatic animals that contribute to the health of local streams and water ways.[379]

Similar to winter weather events and extreme cold events, sheltering in Texas is an essential need for extreme heat events; this is particularly true for homeless individuals, children, and people with chronic or mental illnesses, and pets.[380,381]

Impacts: During the 2011 drought, the extreme heat in Texas "led to declines in crop conditions and abandonment of fields."[382] In 2011, wheat crop yields saw a 47 percent decline from previous years; sorghum saw a 60 percent decline in yields. Additionally, the Texas livestock industry saw a $3.23 billion loss.[383] Water quality also was in jeopardy during the 2011 drought; along with less water generally, the high temperatures increased the pH levels in Texas waterways.[384] On July 24, 2018, the city of Fort Worth opened an emergency shelter with 85 additional beds for the homeless to satisfy existing need.

https://www.scientificamerican.com/article/precarious-life-of-texas-farmworkers-becomes-riskier-with-warming/

[378] Key Nigel Stacy Sneeringer, "Greater Heat Stress from Climate Change Could Lower Dairy Cattle Productivity," USDA, November 3, 2014, https://www.ers.usda.gov/amber-waves/2014/november/greater-heat-stress-from-climate-change-could-lower-dairy-productivity/

[379] "Texas Aquifers," Texas Water Development Board, accessed October 4, 2019, http://www.twdb.texas.gov/groundwater/aquifer/index.asp

[380] Michael Perchick, "High temperatures affecting Austin's shelters, homeless community," KVUE-TV, ABC, June 21, 2017, https://www.kvue.com/article/news/local/high-temperatures-affecting-austins-shelters-homeless-community/451055979

[381] Bob Halmark, "Dealing with The Extreme North Texas Heat on This 1st Day of Summer," CBS DFW, June 21, 2019, https://dfw.cbslocal.com/2019/06/21/summer-weather-heat-advisory-north-texas/

[382] Assaf Anyamba, Jennifer Small, Seth Britch, Compton Tucker, Edwin Pak, Curt Reynolds, , James Crutchfield, Kenneth Linthicum, "Recent Weather Extremes and Impacts on Agricultural Production and Vector-Borne Disease Outbreak Patterns," PLoS One, PMC, NCBI, March 21, 2014, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3962414/

[383] David Anderson, Mark Welch, John Robinson, "Agricultural Impacts of Texas's Driest Year on Record," *Choices*, Agriculture & Applied Economics Association, 3rd Quarter, 2012, http://www.choicesmagazine.org/choices-magazine/theme-articles/what-happens-when-the-well-goes-dry-and-other-agricultural-disasters/agricultural-impacts-of-texass-driest-year-on-record

[384] Lara Lapin, "Dropping Lake Levels Mean Rising Water Quality Issues," *The Texas Tribune*, November 1, 2011, https://www.texastribune.org/2011/11/01/drought-comes-water-quality-issues/

2.6.24.4 *Transportation*

Risks: Extreme high temperatures can buckle railroads and cause delays to the delivery and export of goods and services via these rail lines. Lines used for commercial and mass transit service may become unsafe for the transportation of people and other products due to heat related infrastructure failures. Other mass and public transit options may also become unsafe as high heat levels can lead to failures of air conditioning service on these buses and other modes of transit. As not all transit stops are covered and or protected from the heat, passengers waiting at bus and or rail stops risk a higher chance of being stricken by heat related illness as well. Extreme heat can also lead to airport runways and vehicular roadways to become susceptible to infrastructure deficits as the asphalt can deteriorate and lose its hardened texture.[385] Further, operations and maintenance could be impacted as high temperatures lead to unsafe working conditions for construction crews and transportation related infrastructure becomes faulty due to extreme heat levels.

Impacts: Most roads throughout Texas have been paved with a Performance Grade (PG) pavement binder of 64-22. These grades are designed to withstand a 7-day period of a maximum ambient temperature of 108°F. TxDOT may, on occasion, pave their roads with PG 70-22 or PG-76-22 as well and notes that these pavement binder grades are designed to be sufficient over a 7-day period of maximum ambient temperatures of 119 and 130°F.[386]

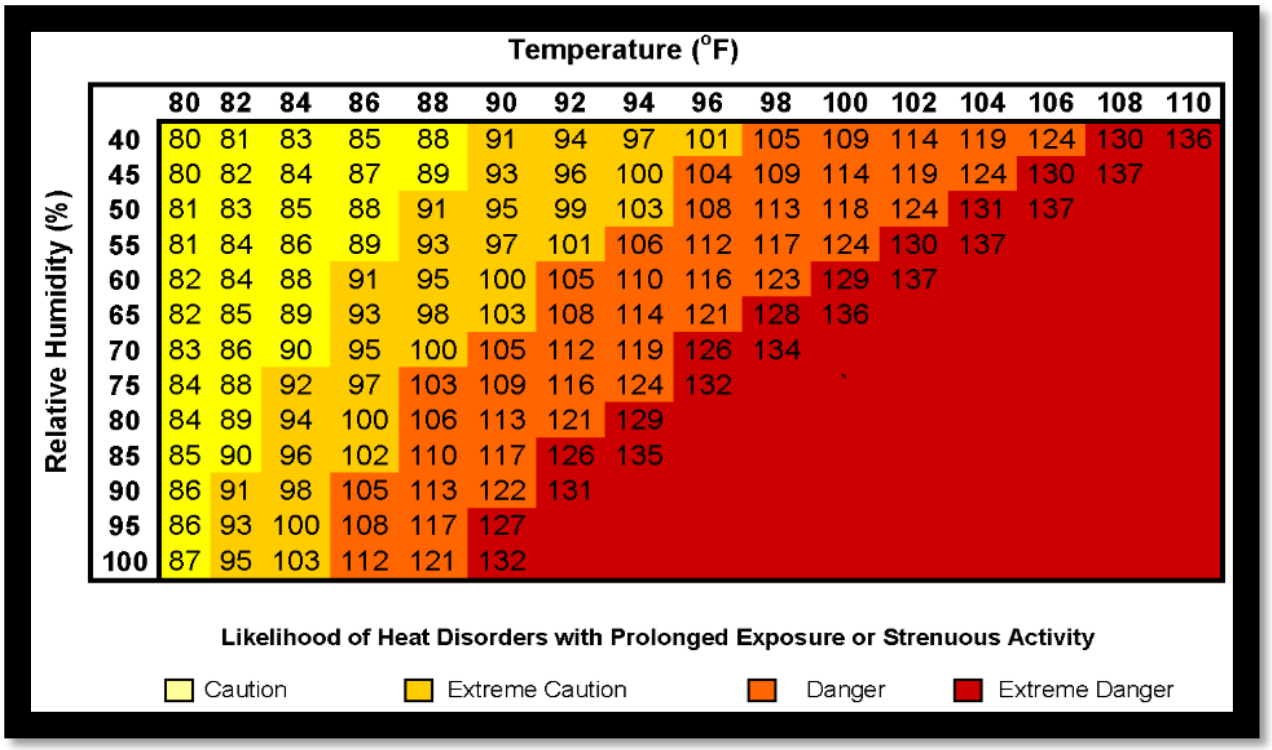
2.6.24.5 *Health and Medical*

Risks: The SHMP notes that heat-related deaths in Texas are projected to increase 1.1 percent per year.[387] Heat stroke, heat exhaustion, heat cramps, and heat rash are just a few heat-related illnesses that are a direct cause of extreme heat and heat exposure in general.[388] While heat-related health and medical issues can affect everybody, those who are elderly, very young, sick, and individuals who do not have access to air conditioning are the most severely impacted.[389] The following table, courtesy of the National Oceanic and Atmospheric Administration (NOAA), presents the likelihood of heat disorders with prolonged exposure or strenuous activity.

[385] "Drought Impacts to Critical Infrastructure," United States Department of Homeland Security, April 23, 2015, https://content.govdelivery.com/attachments/USDHSFACIR/2015/04/30/file_attachments/386534/Drought+Impacts+to+Critical+Infrastructure.pdf
[386] *Central Texas Extreme Weather and Climate Change Vulnerability Assessment of Regional Transportation Infrastructure*, Cambridge Systematics and ICF International, January 2015, https://austintexas.gov/sites/default/files/files/CAMPO_Extreme_Weather_Vulnerability_Assessment_FINAL.pdf
[387] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 446, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[388] "Warning Signs and Symptoms of Heat-Related Illness," Centers for Disease Control and Prevention, accessed October 4, 2019, https://www.cdc.gov/disasters/extremeheat/warning.html
[389] "Heat Precautions," Texas Department of State Health Services, accessed October 4, 2019, https://www.dshs.state.tx.us/heat/

Impacts: The Texas Department of State Health Services notes that from 2003–2008, there were 263 deaths reported among Texas community members with exposure to excessive natural heat as the underlying cause of death.[390] The SHMP also notes a heat event which occurred throughout the Dallas-Fort Worth Metroplex. This extreme heat event, during July 2011, lead to 27 heat-related deaths and many more heat-related illnesses. The warmest temperatures of the month occurred in these first 5 days with highs reaching 113 or 114°F.[391]

Figure 2-60: Heat and Humidity Danger



2.6.24.6 *Hazardous Material (Management)*

Risks: Response personnel, especially those wearing chemical shielding clothing or hazmat related protective gear, are at risk of heat-related illness. These types of protective gear, due to their non-pervious material make-up, can lead to difficulty operating in extreme heat.[392] High temperatures, like extreme cold, can also affect chemicals and chemical containment techniques. Because certain

[390] "Temperature-Related Deaths: Texas, 2003-2008," Texas Department of State Health Services, accessed October 4, 2019, https://www.dshs.texas.gov/chs/vstat/Hotcolddths/hotcolddths.shtm

[391] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 45, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf

[392] Steven De Lisa, "Hazmat Survival Tips: Summertime Hazardous Materials Incidents," *Fire Engineering*, June 20, 2010, https://www.fireengineering.com/2010/06/20/276860/hazmat-summer-incidents/#gref

hazardous materials become unstable at varying temperatures, the risk of unsafe fumes or reactions happening also increase with an increase in temperatures. Standard ventilation measures may not be sufficient to handle a rise in temperature. Volatile chemicals, chemicals that evaporate easily, are viewed as the biggest safety risk when it comes to ambient temperature spikes.[393]

Impacts: On August 31, 2017, in the aftermath of Hurricane Harvey, the high for the day was in the high 80s throughout Southeast Texas and low 90s in isolated areas of the region.[394] While these temperatures are not considered extreme in Texas during late August, these temperatures can be dangerous for volatile chemicals if their storage facility is not operating properly. On August 31, 2017, a tanker full of liquid organic peroxides burst into flames and exploded at the Arkema chemical plant in Crosby. Flooding from Hurricane Harvey had caused the cooling system, along with the backup generators, to fail. According to the Washington Post, "organic peroxide can be tailored to break up at 86 degrees Fahrenheit."[395] Once the chemical was in the process of breaking up and eventually decomposed, it reacted and lead to the explosion.

Figure 2-61: Arkema chemical plant explosion in Crosby in 2017.[396]

[393] "A Guide to Safe Chemical Storage in Hot Weather," Interfocus, accessed October 4, 2019, https://www.mynewlab.com/blog/a-guide-to-safe-chemical-storage-in-hot-weather/
[394] "William P. Hobby Airport, TX," Airport Station for August 30, 2017, Weather Underground, https://www.wunderground.com/history/daily/us/tx/houston/KHOU/date/2017-8-31
[395] Ben Guarino, "The 'extremely flammable' chemical behind the fire in the flooded Texas plant," *Washington Post*, August 31, 2017, https://www.washingtonpost.com/news/speaking-of-science/wp/2017/08/31/the-extremely-flammable-chemical-behind-the-fire-in-the-flooded-texas-plant/
[396] "Flames erupt at Arkema chemical plant flooded by Harvey in Crosby, Texas," CBS News, September 1, 2017, https://www.cbsnews.com/news/flames-erupt-at-arkema-chemical-plant-flooded-by-harvey-in-crosby-texas/

2.6.24.7 *Energy (Power & Fuel)*

Risks: Much like during extreme cold weather events, extreme heat events strain the electric grid as it attempts to keep up with energy demands that are put on it. As people stay indoors to escape the heat, and their air conditioners work harder to maintain a comfortable temperature within the home, business, or other location, energy generation must keep up to meet the demand. In Texas, air conditioning systems are the largest user of energy in homes and businesses. During the summer months, up to 60 percent of a location's total energy is going towards keeping up with air conditioning demands.[397] Power outages and rolling blackouts can then, as a result of the excess energy usage, begin to occur throughout the state if energy consumption is not limited.

Impacts: During the week of August 12, 2019, high temperatures stressed Texas' electrical grid to a point where rolling power outages almost occurred. The Electric Reliability Council of Texas (ERCOT), which delivers electricity to about 90 percent of the homes in Texas, said that "relentless triple-digit temperatures caused them to issue an Energy Emergency Alert for the first time in five and-a-half years."[398]

[397] David Gonzales, "Power usage spiking in Texas during heat wave," CBS KHOU, July 19, 2019, https://www.khou.com/article/news/power-usage-spiking-in-texas-during-heat-wave/285-575639905

[398] "Texas power grid operator issues alert as electricity usage approaches record level," Fox 4 News, August 13, 2019, https://www.fox4news.com/news/texas-power-grid-operator-issues-alert-as-electricity-usage-approaches-record-level

2.6.25 ADDITIONAL NATURAL HAZARDS

The SHMP lists six additional natural hazards, separate from the weather-related hazard risks seen in earlier sections of this document. The additional natural hazards include the following:

- Coastal Erosion
- Inland Erosion
- Land Subsidence/Sinkhole
- Earthquakes
- Expansive Soils
- Dam/Levee Failure

Table 2-9: Additional Natural Hazard Definitions [399]

Texas Hazard Mitigation Plan: Additional Natural Hazards Definitions	
Additional Natural Hazard	SHMP Definition
Coastal Erosion	Coastal erosion is a hydrologic hazard defined as the wearing a way of land and loss of beach, shoreline, or dune material because of natural coastal processes or manmade influences. Coastal erosion is linked to hurricane damage in that healthy coastal dunes and beaches help reduce impacts of hurricanes, tropical storms, and depressions and severe coastal flooding.
Inland Erosion	Inland erosion is the wearing-away of soil or removal of the banks of streams or rivers. It involves the breakdown, detachment, transport, and redistribution of soil particles by forces of water, wind, or gravity. Soil erosion on cropland is of particular interest because of its on-site impacts on soil quality and crop productivity, and its off-site impacts on water quantity and quality, air quality, and biological activity.
Land Subsidence/Sinkhole	Land Subsidence is the loss of surface elevation caused by subsurface movement of earth materials. The level of subsidence ranges from a broad lowering to collapse of land surface. An example of land subsidence is a sinkhole.
Earthquakes	An earthquake is a sudden release of energy created by a movement along fault lines in the earth's crust. Earthquakes produce three type of energy waves: • Primary (P) waves have a push-pull type of vibration. • Secondary (S) waves have a side-to-side type of vibration.

[399] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 253, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf

Texas Hazard Mitigation Plan: Additional Natural Hazards Definitions	
Additional Natural Hazard	SHMP Definition
	• Surface (L) waves travel along Earth's surface, causing most of the damage of an earthquake.
Expansive Soil	Expansive soils are soils that expand and or shrink when water is introduced or limited to an area. Expansive soils can impact structural foundations, but there is little documentation of site-specific past events in Texas due to expansive soils.
Dam/Levee Failure	A dam failure is defined as systematic failure of dam structure resulting in the uncontrolled release of water, often resulting in floods that could exceed the 100-year floodplain boundaries. Levees have been constructed in Texas for more than 100 years to protect farm and ranch land and populated areas from flood flows. There is no database identifying and locating the levee systems in Texas. Any populated areas behind levees could be at risk during major flood events.

Each of the six additional natural hazards pose their own specific risks and impacts to Texas, though not as severe as the weather-related hazard risks in the previous section of this document. Since the SHMP separates these additional hazards from those already presented, the additional hazards will not be presented through FEMA's Community Lifelines format.

2.6.25.1 *Coastal Erosion*

At 367 miles, Texas has the 6th longest coastline in the United States.[400] As described in the SHMP, coastal erosion can affect natural systems, coastal food supplies, Texas' coastal tourism industry, and the viability of smaller towns up and down the Gulf of Mexico. The GLO manages coastal erosion by overseeing the expenditure of funds and documenting its progress to the state legislature in Coastal Erosion Planning and Response Act reports. Coastal erosion can affect the natural and built environment while specific impacts depend on topography, soils, building types, and construction material. Mitigation techniques include dune and beach restoration, building seawalls, and placing semi-permanent obstructions perpendicular to beaches. Coastal erosion mitigation actions have the benefit of helping reduce impacts from hurricanes and severe coastal flooding.

[400] Janice Cheryl Beaver, "U.S. International Borders: Brief Facts," CRS Report for Congress, November 9, 2006, https://fas.org/sgp/crs/misc/RS21729.pdf

2.6.25.2 *Inland Erosion*

Similar to coastal erosion, inland erosion can affect the natural and built environment and is usually dependent on topography, soils, farming practices, engineering and construction types, and materials. Inland erosion can remove top soil, scour river banks, and collapse bridges and roads. Inland erosion can also result in the siltification (the pollution of water by particulate terrestrial clastic material, with a particle size dominated by silt or clay) of lakes and reservoirs, reducing their usefulness as flood control features and as sources of water supply. Mitigation efforts for inland erosion include improving farming methods and construction standards, installing groundwater recharge features, and channeling creeks.

2.6.25.3 *Land Subsidence/Sinkhole*

The majority of subsidence activity in Texas are caused by human activity, as presented in the SHMP. Mining and excessive groundwater removal from shallow aquifer systems can lead to land subsidence and sinkholes. Land that is located above shallow aquifer systems, or adjacent to areas of dissolved rocks, has a greater risk of experiencing subsidence. Sudden collapses of surface areas can damage and destroy homes, commercial buildings, and infrastructure, particularly roads and highways. Land subsidence can also increase coastal communities' risk of inundation and saltwater intrusion from storm surge as regulating groundwater interaction is critical to mitigating this issue throughout the state.

2.6.25.4 *Earthquakes*

Texas' earthquake risk is small in comparison to many other states, including California, Missouri, Montana, South Carolina, and Washington. The closest high hazard fault system to Texas is the New Madrid fault, which extends from Arkansas and Tennessee north through Missouri, Kentucky, and Illinois. El Paso and the Panhandle region are two areas of Texas that can expect earthquakes with magnitudes of about 5.5 - 6.0 to occur every 50 - 100 years. In south Central Texas the hazard is generally low, but small earthquakes can still occur. The largest earthquake to affect Texas occurred on May 3, 1887 and originated in Sonora, Mexico. The largest earthquake to originate in Texas, measuring at a magnitude 6, was on August 16, 1931 and caused severe structural damage in an around Valentine.[401]

2.6.25.5 *Expansive Soils*

Damages from expansive soils are most prevalent when periods of moderate to high precipitation are followed by drought and then again by periods of heavy rainfall. While all infrastructure is vulnerable to expansive soils, slab-on-grade structures are most likely to suffer damages. In addition, older structures built to less stringent building codes may be more susceptible to damages

[401] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, page 246, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf

than new construction. Bridges, highways, streets and parking lots are especially vulnerable when they are constructed when clays are dry, such as during a drought, and then subsequent soaking rains swell the clay. However, there is little documentation of site-specific expansive soil past events from local, state, or national datasets. This makes it difficult to quantify damage on a statewide level, and the hazard poses no real threat to the public as there are no known injuries or fatalities.

2.6.25.6 *Dam/Levee Failure*

The SHMP notes that there are currently 7,310 dams and levees in Texas. This number includes federal dams, which are classified as high hazard, meaning if failure occurs it is likely there will be fatalities. This classification does not necessarily mean that these dams are in need of repair. The term high-hazard reflects the dam's potential for causing damage downstream should it fail, which is termed as dam inundation. In addition, there are 607 dams which are classified as significant hazard, meaning that there could possibly be loss of life if the dam should fail. Roughly 97 percent of Texas' dams are made of earth, and most dams are privately owned and have low-hazard potential.

2.7 Hazards by County

2.7.1 Composite Disaster Index Overview

In order to gauge risks posed by various natural hazards to a state as geographically and climate diverse as Texas, the GLO partnered with the Center for Space Research (CSR) at UT Austin to conduct geospatial analyses of historical hazard damage across each of the state's 254 counties. Analyzing 20 years of available data for seven natural hazard categories, CSR answered a basic question: for each respective county, what types of hazard damage, if any, have occurred and, reasonably, are likely to occur again? Through CSR's analysis technique, hazard impacts were normalized and compared for the entire state at the county level; intensities of each hazard impact were mapped across the state and then weighted to produce a composite map that highlights the counties that are most frequently impacted by the most severe natural hazards over the past two decades. The data and maps generated through this effort are referred to as the Composite Disaster Index (CDI) and serve as one of the four factors used in the allocation methodology that determines the apportionment of funds in program competitions and regional allocations as applicable.

2.7.2 CDI Methodology

The CDI was developed using seven different representations of historical data selected to document the distribution of natural hazard damage across Texas' 254 counties: (1) repetitive flood losses; (2) high winds from hurricanes; (3) wildfires; (4) major river flood crests; (5) tornado; (6) persistent drought conditions; and (7) hail. While accurate and well-structured data is available for many of these hazard indicators going back decades, the CDI uses data from the years 2001 to 2018, which are likely to be of the highest accuracy and best represents the climatic conditions facing Texas today.

To create the CDI, a uniform method was applied to represent the county-level data for each natural hazard category. For each hazard category (e.g., high winds from hurricanes, wildfires), the 25 counties that were impacted most frequently by that particular hazard were ranked in the top 10 percent, with the next 39 counties in the remainder of the top 25 percent. The following 127 counties fell in the midrange (25-75 percent) and experience an impact frequency that reflects the statewide average. The next 39 counties are occasionally affected and fall below the statewide average (bottom 25 percent), while the final 24 counties experience the least frequent impacts and form the bottom 10 percent. With this normalized ranking across the seven hazard categories complete, a composite index was created that combined the weighted impact of each hazard category for each county.

2.7.3 HAZARD CATEGORIES

The seven analyzed hazard types were chosen to represent the disaster profile of Texas due to the cumulative impact on the state's population. These hazard types and their impacts are explained in greater detail below.

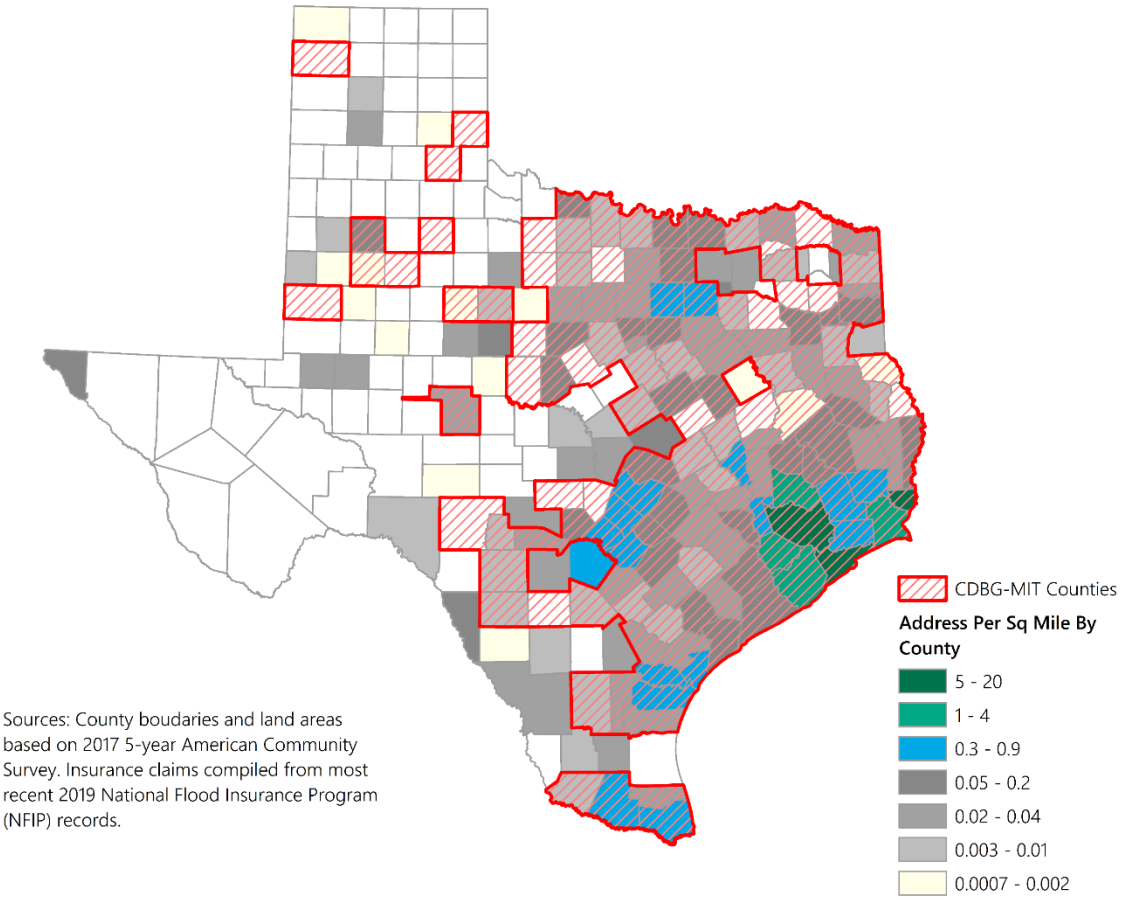
Table 2-10: CDI Hazard Types

Hazard Type
Repetitive Loss (NFIP) from Flooding
Hurricane Winds
Wildfire
River Flood Crests
Tornado
Drought
Hail

2.7.3.1 *Repetitive Flood Losses*

Flooding from hurricane storm surge, tropical and non-tropical heavy rainfall events, and river floods following heavy rainfall in the upstream areas of river basins, cause the most destructive disasters in Texas. FEMA's National Flood Insurance Program (NFIP) claims records of repetitive losses from floods available from 2000 to the current year provide excellent data to identify the counties most impacted by flooding. The distribution of counties in the top 10 percent shows the strong influence of coastal events, flash flooding downstream of the Texas Hill Country and urban flooding in the Dallas-Fort Worth region. River floods that follow the courses of the Colorado, Trinity, Red, Sabine and Rio Grande are also evident.

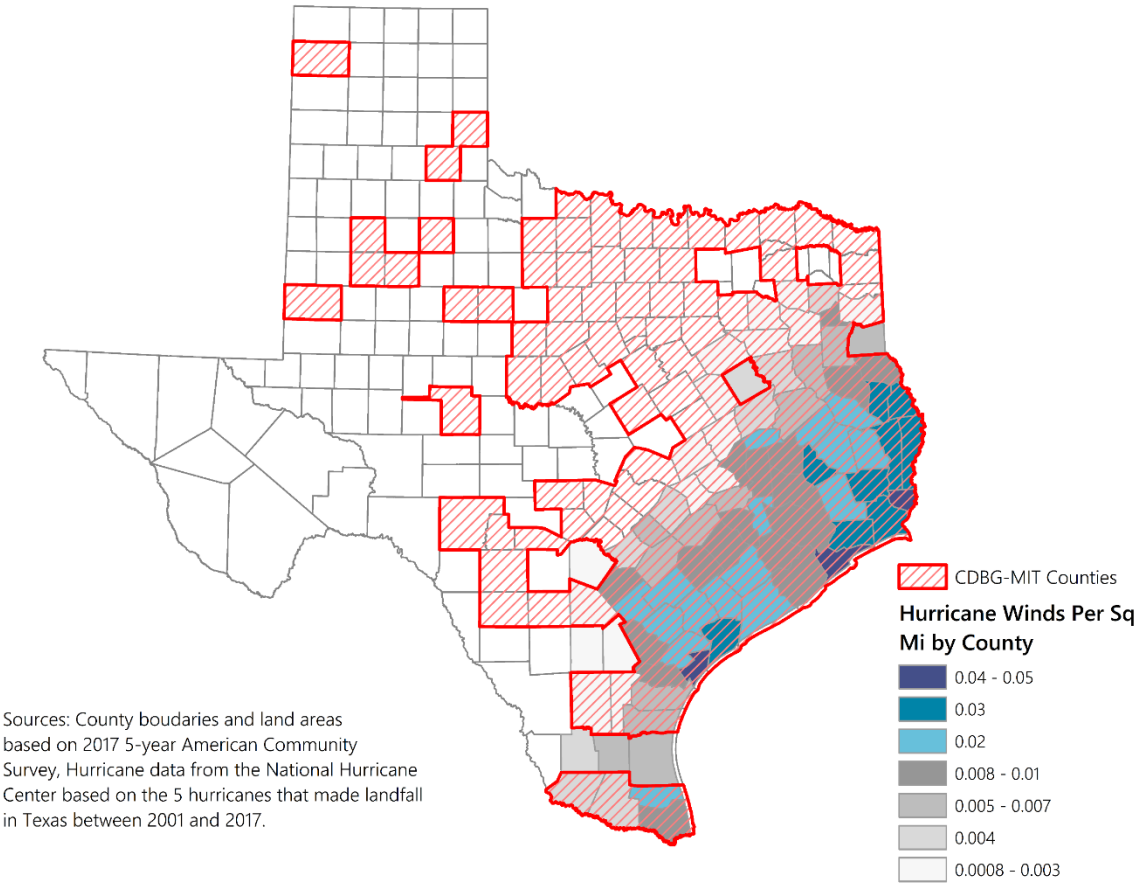
Figure 2-62: NFIP Repetitive Loss Properties per Square Mile (2001-2018)



2.7.3.2 *Hurricane Winds*

The high wind speeds generated during the landfall of large tropical cyclones are second in their destructive impacts only to flood inundation. These impacts are assessed using geospatial data from the National Hurricane Center (NHC) that tracks hurricane wind speeds over given areas. Within the past two decades, the most severe wind damage in both the coastal region of Texas and adjacent interior counties occurred during the landfall of seven significant storms: Bret (1999), Claudette (2003), Rita (2005), Humberto (2007), Dolly (2008), Ike (2008) and Harvey (2017). By creating a composite of all of the wind field measurements contained in the NHC advisories issued for these seven storms, the areas most frequently impacted by hurricane-force and strong tropical storm-force winds can be identified. In the past 20 years, strong storms have had a greater impact along the upper Texas Gulf Coast and interior areas of East Texas, though the observed pattern could change with a shift of storm tracks toward south Texas.

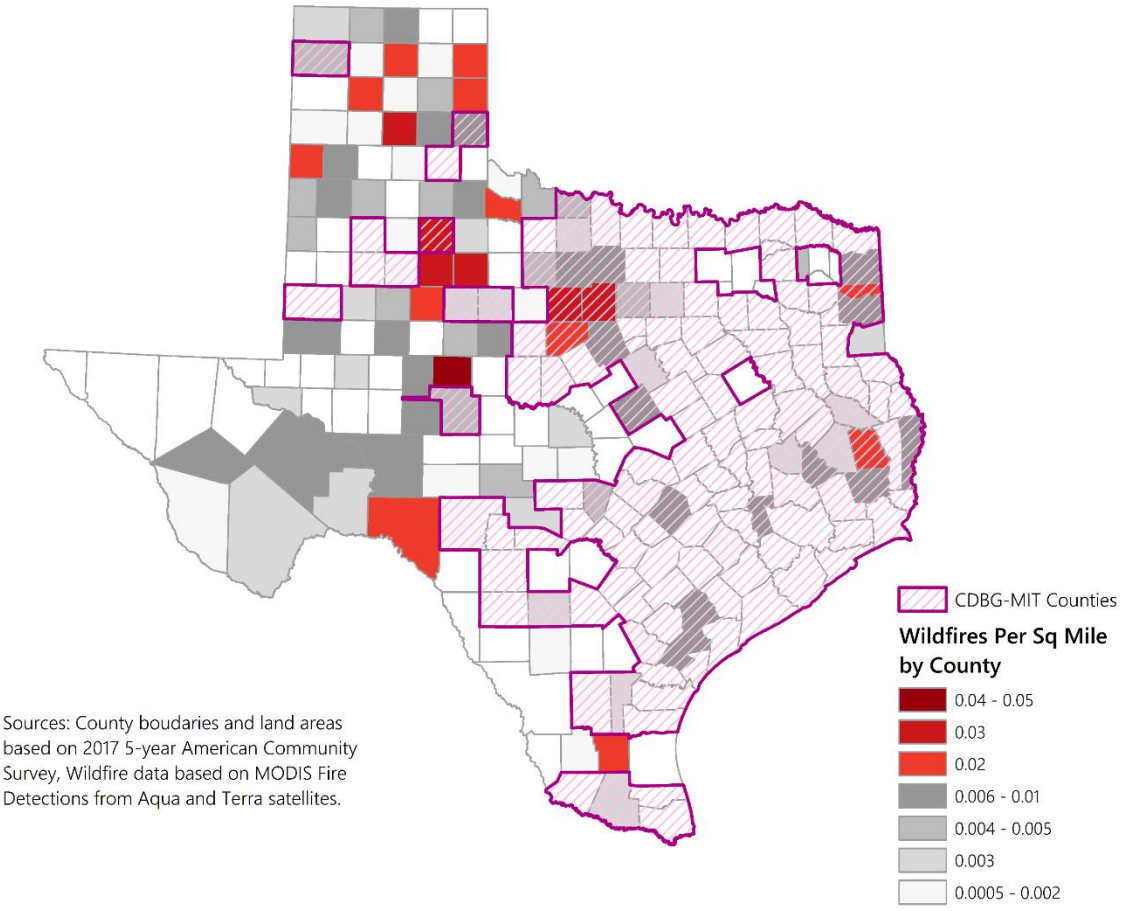
Figure 2-63: Hurricane Winds per Square Mile by County (2001-2017)



2.7.3.3 *Wildfires*

Wildfires are prevalent in the more arid regions of the state, but may happen during harsh, prolonged drought periods in any region. Sensor observations from NASA satellites can detect and track the progress of wildfires as they burn. To create a geospatial representation of wildfire impacts in Texas, the thermal Radiative Fire Power (RFP) measurements from NASA's Terra and Aqua MODIS instruments were collected from the NASA Fire Information for Resource Management System (FIRMS) database for the period from 2001 through 2018. A 600-megawatt RFP threshold was selected to isolate hot, active wildfires, and the number of thermal detections was normalized over areas of 100 square kilometers. The frequency of wildfires detected by satellite observations shows the expected pattern of counties in the top 10 percent occurring largely in western regions beyond the 100th meridian (from the eastern Panhandle continuing west). However, several outliers occur in other parts of the state. The outlier counties are strongly associated with wildfires that spread during the period of exceptional drought from 2011 to 2013 and include rangeland fires in Brooks County in south Texas; large forest fires in Marion and Cass Counties in Northeast Texas; and the Bastrop County Complex fire in Central Texas.

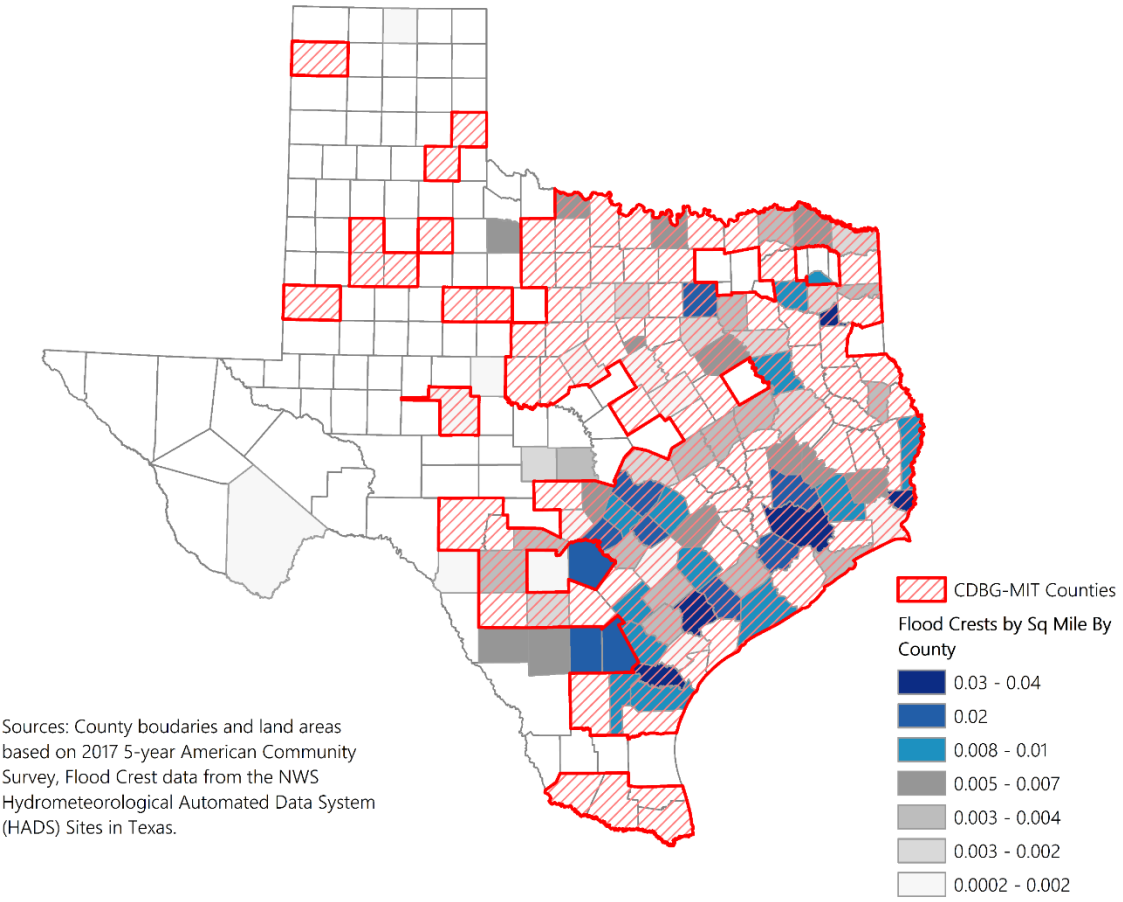
Figure 2-64: Wildfires per Square Mile by County (2001–2018)



2.7.3.4 *River Flood Crests*

One way to measure the impact of river flooding takes into account the major river flood crests recorded at observation sites (typically automated river gauges) along river networks. National Weather Service data from their Hydrometeorological Automated Data System (HADS) sites includes historical crests dating back more than a century ago. The distribution of the top 10 percent of counties is comparable to that reflected in the repetitive flood loss map (but excludes the coastal impacts created by storm surge). Counties in this top 10 percent category include some rural locations with low populations that experience relatively high frequencies of major river flood crests.

Figure 2-65: Flood Crests per Square Mile by County (2001-2017)

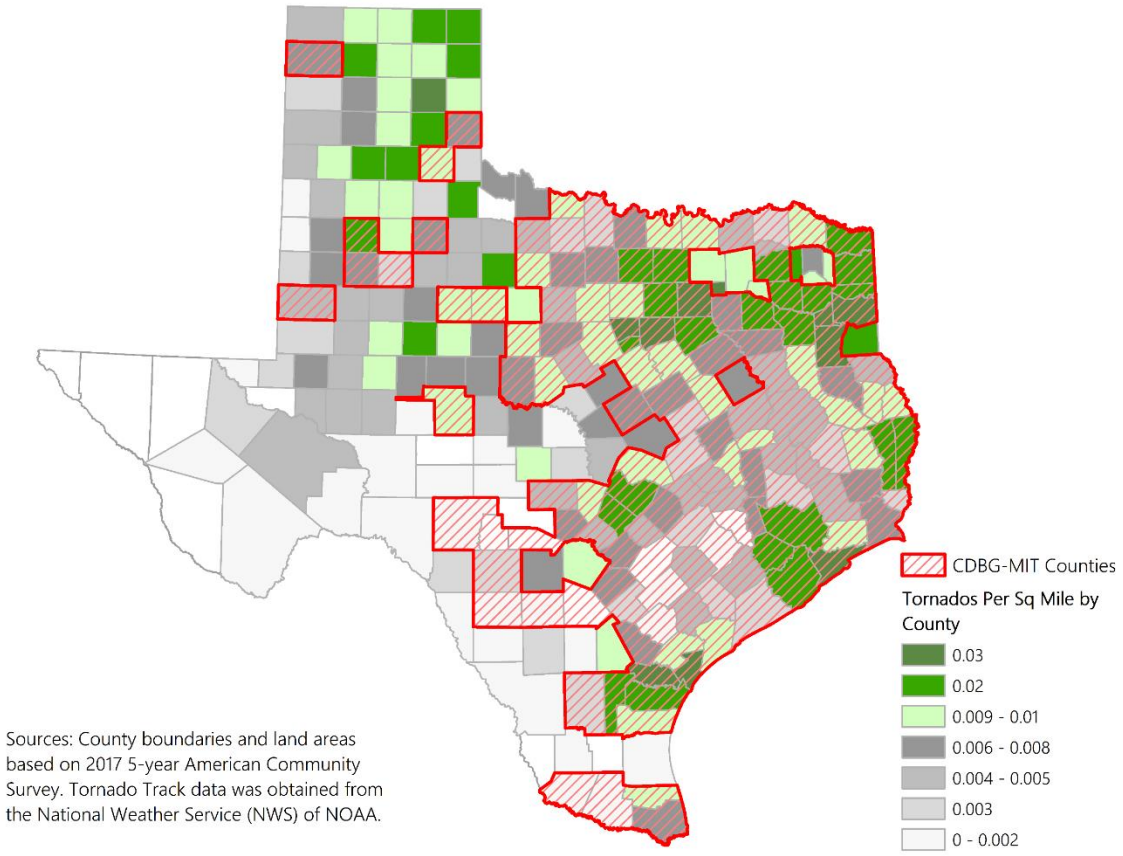


2.7.3.5 *Tornadoes*

Tornadoes are rare in many regions of the state but often cause catastrophic damage where they do strike. NOAA maintains several tornado databases of historical events, the most useful being the data set containing the chronology and track length records of tornadoes in the continental United States from 2001 to 2017, as represented in the well-structured DHS Homeland Infrastructure Foundation-Level Data (HIFLD). The tornado tracks crossing Texas were extracted from the HIFLD compilation, and the cumulative track lengths measured for each county. Next, the track length measurements were normalized by the surface areas of the counties. The county distribution of the normalized tornado tracks produces recognizable seasonal patterns of tornado impacts. Tornadoes in the spring and fall tend to occur during the turbulent passage of energetic low-pressure systems and cause more frequent strikes extending from Central Texas through Northeast Texas, as supercells form and train along the moving frontal boundary. During summer months, tornadoes tend to form along the highly energetic convergence zone of the subtropical jet over the Panhandle. The locations of counties indicated in the top 10 percent of tornado impacts mirrors aspects of the seasonal tornado climatology. It should be noted that many tornadoes form

along and near the coastline, particularly during tropical events; however, coastal tornadoes tend to be very weak and short-lived and thus do not generate long tracks.

Figure 2-66: Tornadoes per Square Mile by County (2001-2017)

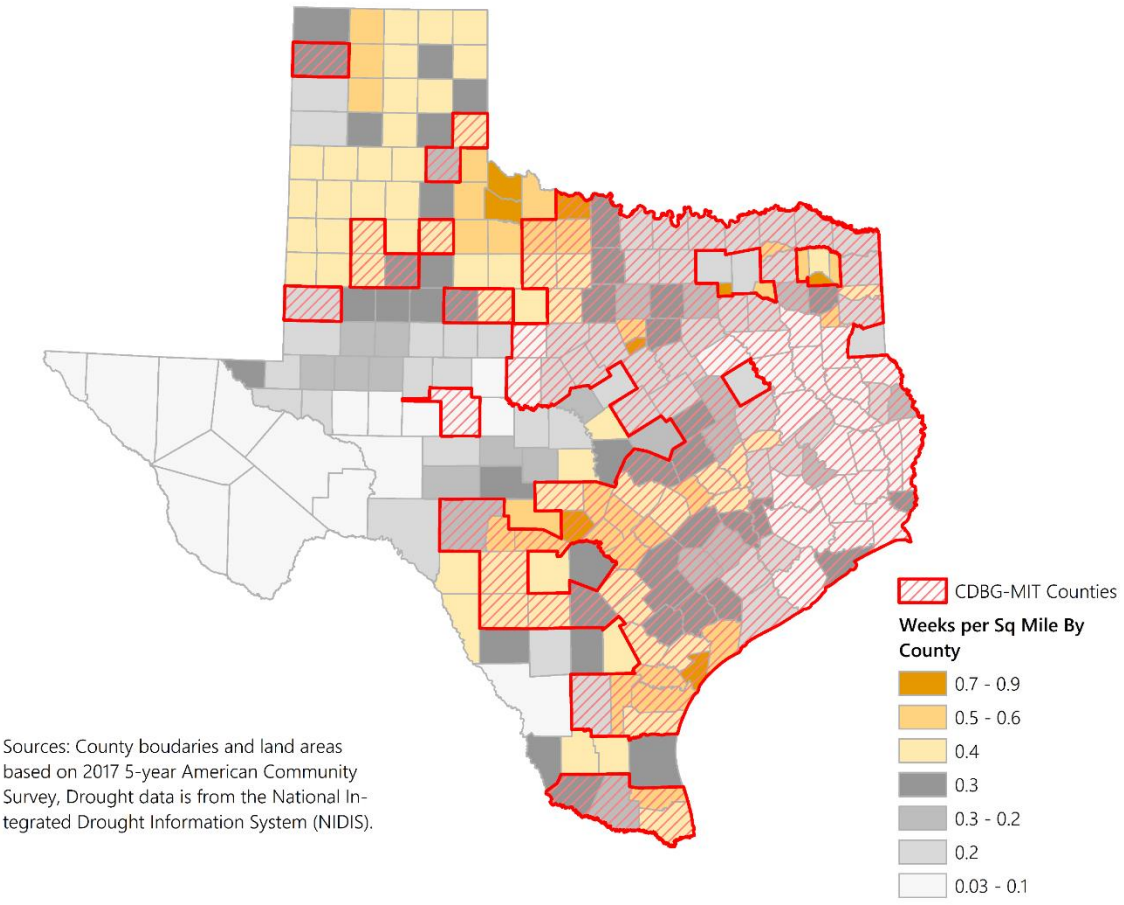


2.7.3.6 *Drought*

Droughts often create the preconditions for wildfires and have additional impacts on stream flows, groundwater availability, reservoir storage, and agricultural production. A weekly comprehensive determination of drought conditions within counties is prepared nationally by groups of climate experts and presented in the products of the U.S. Drought Monitor (USDM) developed by the U.S. Department of Agriculture and NOAA. For the study, the USDM database compilations for county-level data were acquired from 2001 through 2018. Only areas of D3 (Extreme) and D4 (Exceptional) drought were used in the analysis, and the D4 designations were assigned twice the weight of areas having D3 conditions. The resulting map illustrates that western, more arid regions of the state are also more prone to extended drought. The locations of the top 10 percent of counties with drought impacts were also heavily influenced by the exceptional drought period that occurred from 2011 through 2013, a protracted dry spell that exceeded the "drought of record" experienced

in Texas during the 1950s. Regions most affected by this recent exceptional drought period include south Texas and counties on the Edwards Plateau; along the Rio Grande between Laredo and Del Rio; and in the Rolling Plains along the Red River.

Figure 2-67: Drought: Weeks per Square Mile by County (2001-2018)

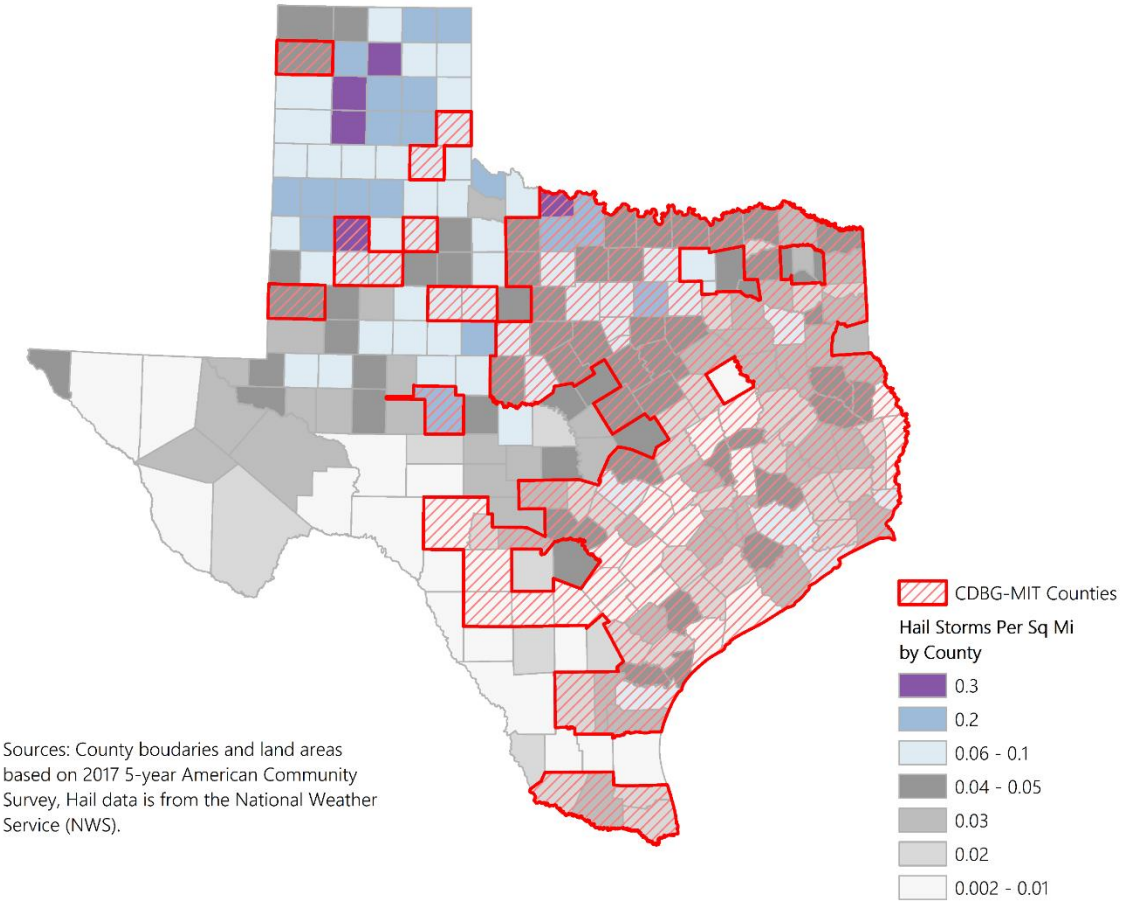


2.7.3.7 *Hail*

Hailstorms are a frequent occurrence in Texas and affect all its regions. Hailstorms can cause massive damages to property, as an April 2016 storm did in Bexar County where hail peaking in size at 4.5 inches in diameter caused a record-breaking $1.6 billion in insurance losses ($560 million for automobile damage and $800 million for home damage).[402] Texas hailstorm data indicates area hailstorms are most frequent in the north central and northwestern parts of the state, with a concentration in the Panhandle region.

[402] Hamphire, Williams, Fogarty, "An Analysis of the Record Breaking April 12, 2016 San Antonio Hail Storm Compared to Other Giant Hail Storms," WFO Austin San Antonio, National Weather Service, https://ams.confex.com/ams/97Annual/webprogram/Manuscript/Paper303219/3363542_ExtendedAbstract.pdf

Figure 2-68: Hailstorms per Square Mile by County (2001-2018)



2.7.4 Composite Disaster Index Result

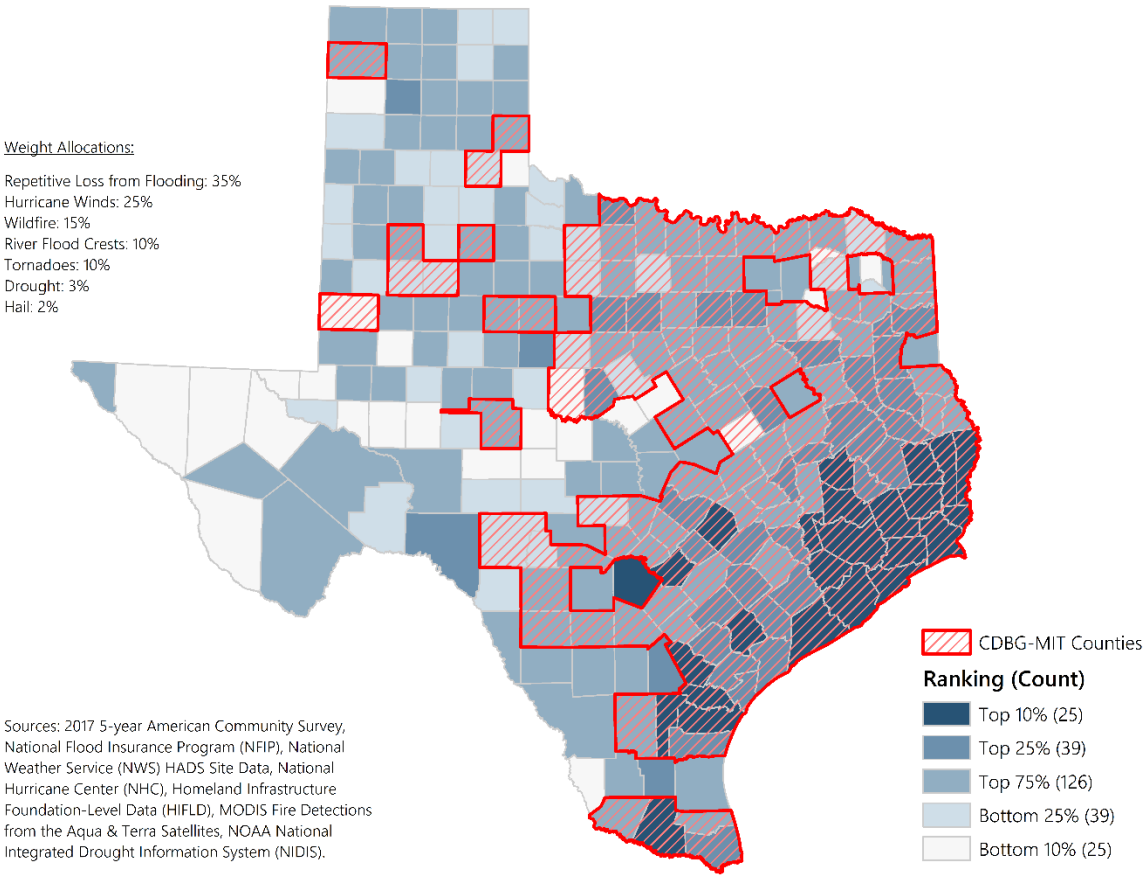
The CDI combines the magnitude of these seven hazard categories across the county geographies of the state, producing a single representation of the composite disaster vulnerability of Texas counties. To accomplish this, the CDI assigns weighting factors linked to the degree of impact associated with different kinds of hazards. The weights for the seven hazard categories are presented in the table below. The weighting of these factors reflects the relative degree of impact these hazards have on property losses and human casualties. Flooding and hurricane winds have historically been the most lethal and damaging occurrences in the state, whereas the consequences of the other disaster impacts—while not trivial—are not as severe and long-lasting in most instances.

Table 1-1: Composite Disaster Index Weights

Hazard Type	Weight Allocation
Repetitive Loss (NFIP) from Flooding	35%
Hurricane Winds	25%
Wildfire	15%
River Flood Crests	10%
Tornado	10%
Drought	3%
Hail	2%

When mapped, the CDI illustrates the areas most vulnerable to natural hazards. As shown in the figure below, the Texas coast, particularly from Matagorda County east to the Beaumont-Port Arthur area, is at the greatest risk to impacts from natural hazards—primarily hurricane winds and flooding. Hardin County in Southeast Texas has the highest composite score of any Texas county. In addition, portions of Central, South Central, and South Texas are also highly vulnerable, as they are exposed to frequent flooding, tornadoes, and hurricane winds.

Figure 2-69: Composite Disaster Index (2001-2018)



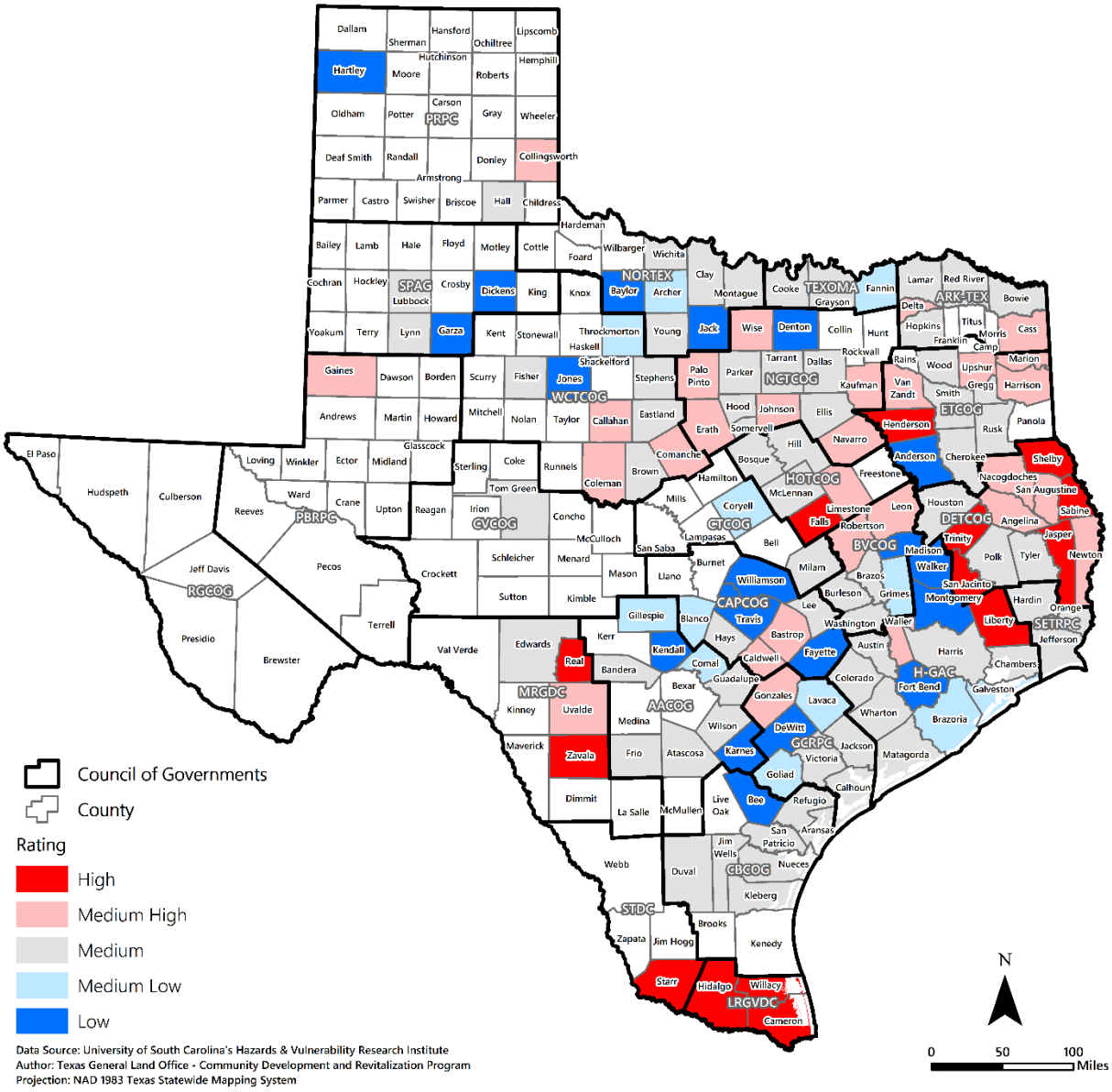
2.8 Social Vulnerability Index

The Social Vulnerability Index (SoVI) measures the social vulnerability of counties across the United States — in particular, their vulnerability to environmental hazards. This index, developed by the University of South Carolina's Hazards & Vulnerability Research Institute, synthesizes 29 socioeconomic variables which contribute to reduction in a community's ability to prepare for, respond to, and recover from hazards. SoVI is a comparative metric that facilitates the examination of the differences in vulnerability among counties. It is a valuable tool because it graphically illustrates the geographic variation in social vulnerability, which in turn contributes greatly to response and recovery capabilities. SoVI shows where there is uneven capacity for disaster preparedness and response, and where resources might be used most effectively to reduce pre-existing vulnerability. The data sources for the development of SoVI come primarily from the United States Census Bureau. The SoVI data combines the best available data from both the 2010 U.S. Decennial Census and 5-year estimates from the American Community Survey (ACS). The below map demonstrates the SoVI for the 140 CDBG-MIT eligible counties in Texas.

The SoVI details above are further explained by some of the characteristics at the individual level that affect vulnerability. One of these characteristics is that of Socioeconomic Status which affects the ability of a community to absorb losses and be resilient to hazard impacts. This is due to the idea that wealth enables communities to absorb and recover from losses using insurance, social safety nets, and entitlement programs. Other factors used in SoVI relate to gender as well as race and ethnicity being that these factors impose language and cultural barriers and affect access to post-disaster funding. Additional factors used in SoVI are special-needs populations, social dependence (i.e., people who are totally dependent on social services for survival), education, family structure, occupation, and other demographic characteristics that help to define social vulnerability for communities and individuals.

Effectively addressing social vulnerability decreases both human suffering and the economic loss related to providing social services and public assistance after a disaster.

Figure 2-70: Social Vulnerability Index for CDBG-MIT Eligible Counties



2.9 Per Capita Market Value

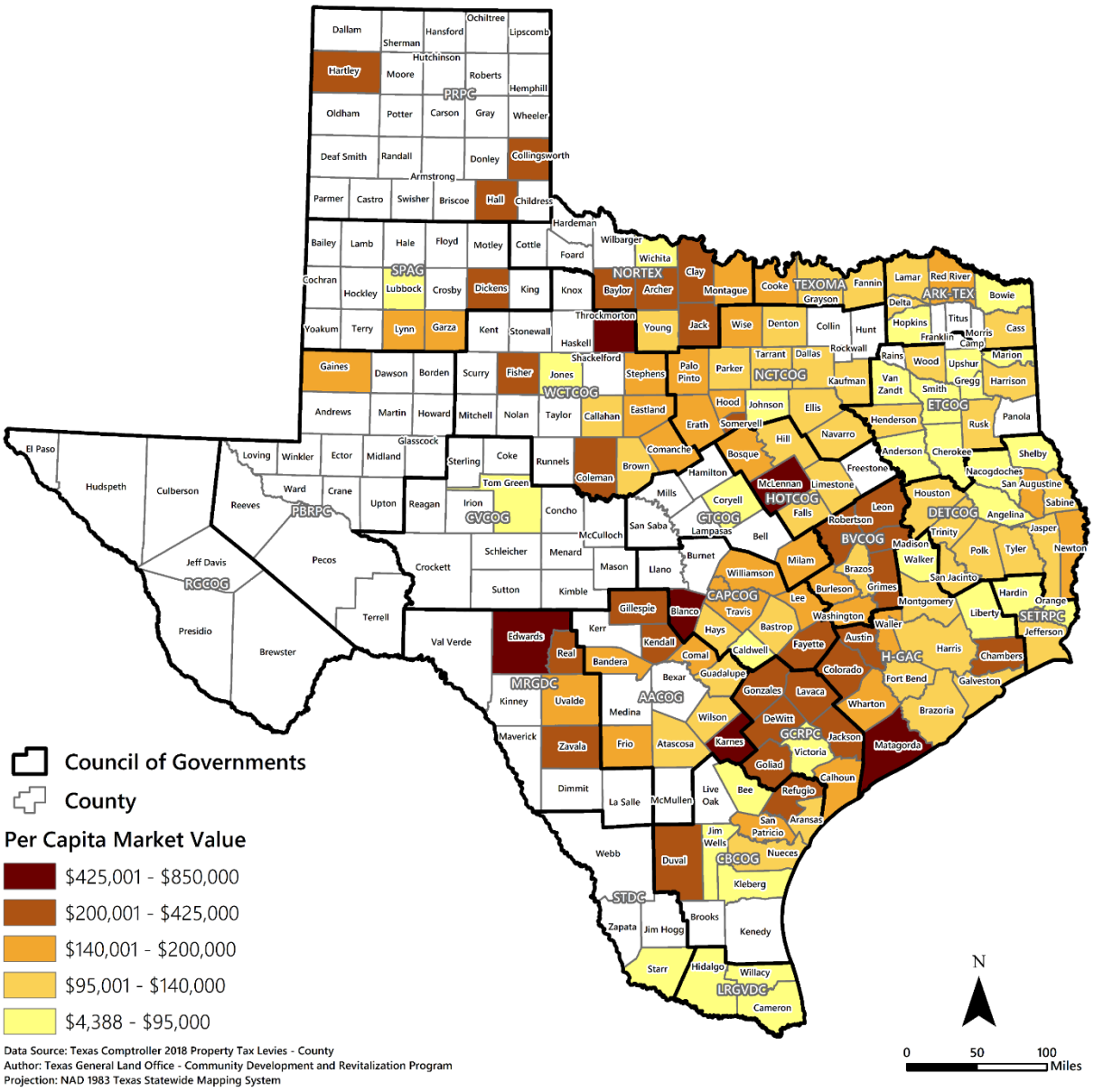
While SoVI describes a community's capacity to prepare for, respond to, and recover from hazards based on the socio-demographic composition of an area, another important consideration is a community's financial capacity to fund disaster recovery and hazard mitigation activities. Financial capacity refers to the ability of a unit of local government to generate revenue to fund its operations and capital expenditures.

To analyze that capacity, the per capita market value—the market value of all property in a county divided by the county population—for all eligible counties was collected from the state comptroller's office and used as a factor in the state allocation model, located in Appendix F.

In Texas, communities rely primarily on sales and property tax revenues to fund governmental activities. To compare the suitability of possible proxies for financial capacity in an allocation model, it is necessary to analyze the sources from which both sales and property taxes are generated: overall sales and the market value of property. Overall sales reflect local business conditions, particularly the number of businesses and the sales from those businesses. However, sales tax revenue can vary widely from year to year based upon factors outside of a jurisdiction's control, including national and local economic conditions. This variability and its causes make sales tax revenue less desirable as a proxy for financial capacity. Market value of property, while also somewhat variable, is less so than sales tax and has the benefit of having a direct tie to the overall financial value of a community. That value is generated from the presence of government services and infrastructure, the business and job climate, local amenities, and the housing stock. In economic terms, those factors are less elastic, meaning they do not respond as quickly to changes in supply and demand, and thus serve as a superior metric for long-term financial capacity. Additionally, those factors encompass the perceived economic conditions of a community—the sole metric upon which sales and sales tax are based.

The map below shows the per capita market value for the 140 eligible counties.

Figure 2-71: Per Capita Market Value by County (2018 Valuations)

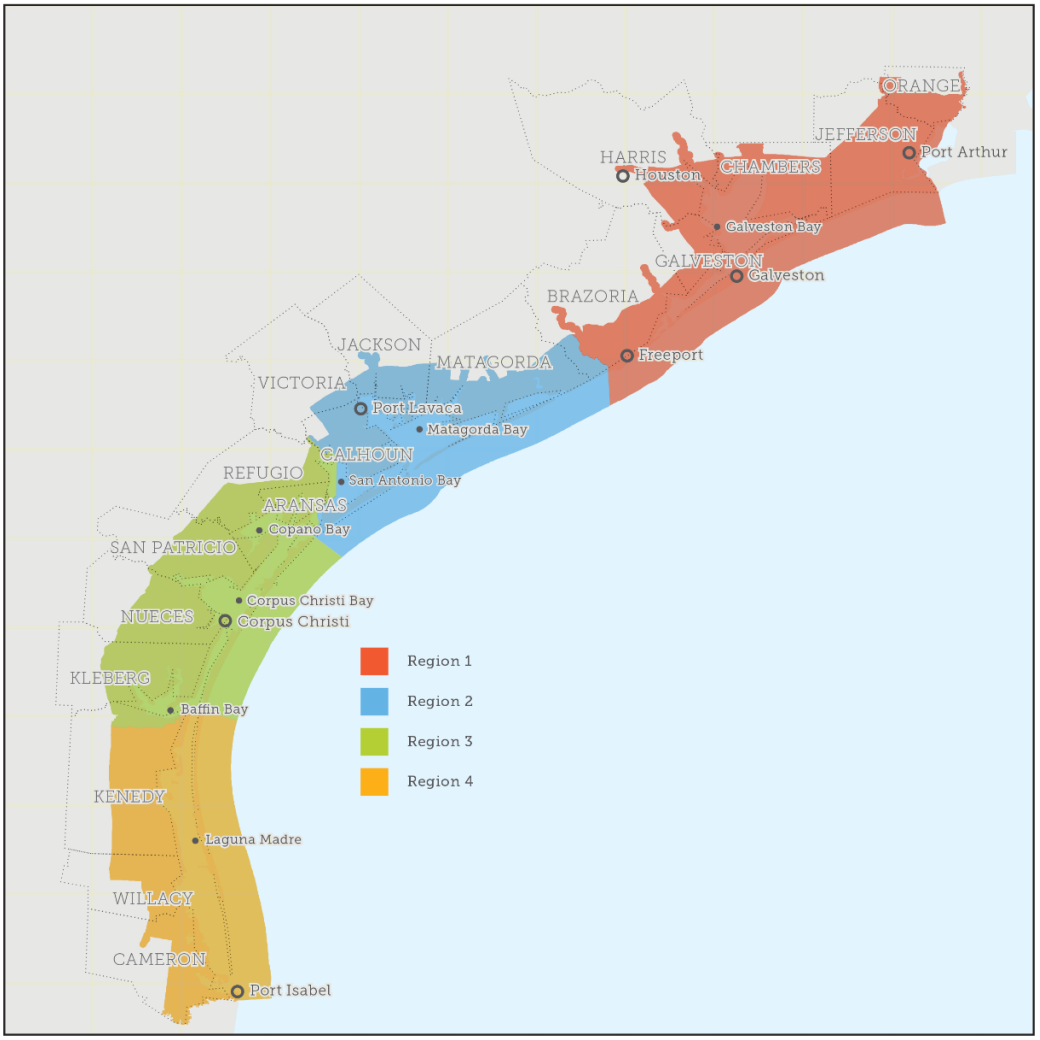


2.10 Review of State Reports, Studies, and Legislation

2.10.1 The Texas Coastal Resiliency Master Plan

The GLO released the *Texas Coastal Resiliency Master Plan* (Resiliency Plan) in 2017, with an updated iteration in 2019, to guide the GLO's efforts in restoring, enhancing, and protecting the state's coastal zone. The Resiliency Plan provides a framework to protect communities, infrastructure, and ecological assets from coastal hazards, including short-term direct impacts, as well as long-term gradual impacts. Through the Resiliency Plan, the GLO is working toward an adaptable planning process that accommodates changing coastal conditions, as well as evolving needs and preferences of Texas coastal communities.

Figure 2-72: The Four Regions of the Texas Coastal Zone

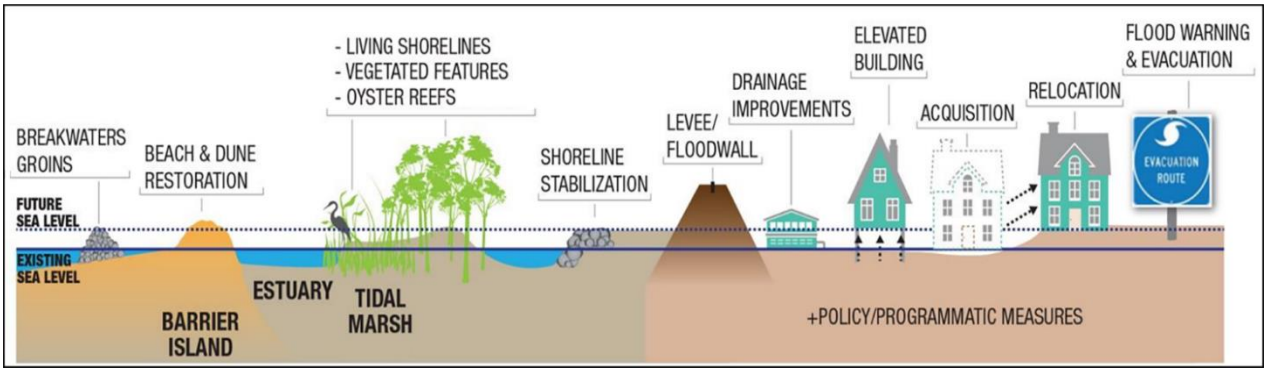


The Resiliency Plan pinpoints eight specific issues of concern that result from pressures exerted on the coastal environment from human activities and natural processes. The issues of concern addressed by the Resiliency Plan are:

- Coastal flood damage;
- Coastal storm surge damage;
- Gulf beach erosion and dune degradation;
- Bay shoreline erosion;
- Altered, degraded, or lost habitat;
- Impact on water quality and quantity;
- Impact on coastal resources; and
- Abandoned or derelict vessels, structures, and debris.

The Resiliency Plan identifies and proposes individual projects grouped into actions and strategies that produce measurable economic and ecological benefits to advance coastal resiliency. The Resiliency Plan calls for a balanced approach in managing coastal resources focused on community resiliency, ecological health, and economic growth by recommending projects ranging in type from nature-based ("green infrastructure") to structural-based ("gray infrastructure") to nonstructural-based projects, plans, policies, programs, and studies to employ a multiple lines of defense approach to coastal planning.

Figure 2-73: The Multiple Lines of Defense[403]



The development of the Resiliency Plan has been a collaborative effort bringing together a wide range of planning considerations from a diverse set of coastal stakeholders. The projects recommended in the Resiliency Plan were vetted and prioritized through input from a Technical Advisory Committee comprised of researchers in many fields of coastal science; state and federal natural resource agency personnel; members of public, private, and non-governmental

[403] Graphic courtesy of the U.S. Army Corps of Engineers.

organizations; local government representatives; and engineering and planning experts. After the application of an initial screening criteria, the Technical Advisory Committee evaluated all candidate projects based upon the level of benefit each project would provide to each issue of concern, the feasibility level of the project, and whether the project would be considered a priority given the current state of the coast. Projects offering co-benefits between hazard mitigation and ecological resiliency rank as those best suited for inclusion in the Resiliency Plan.

The GLO's coastal master planning efforts began with a study released in 2012 titled *Shoring Up the Future for the Texas Gulf Coast*, which spotlighted the value and vulnerabilities of the state's coastal areas. That planning endeavor has informed the continued and ongoing state coastal planning effort that has evolved into the Resiliency Plan and has since been used to coordinate work being done on the Texas coast with other state and federal projects. The U.S. Army Corps of Engineers (USACE), consulted the 2012 study during the early scoping phase of the *Coastal Texas Protection and Restoration Feasibility Study* and has continued coordination with the GLO through the completion of the 2019 Resiliency Plan. This collaborative approach has allowed for complementary elements between projects proposed in the GLO Resiliency Plan and the USACE study. Ongoing projects have been leveraged to inform the Resiliency Plan, such as the *Sabine Pass to Galveston Study*, a study also led by USACE in partnership with the GLO. The coastal storm risk management projects proposed through the *Sabine Pass to Galveston Study* are included in the prioritized projects in the Resiliency Plan. Another coastal planning effort that informed the Resiliency Plan is the GLO's *Texas Coastal Infrastructure Study*, completed in 2016 to identify critical infrastructure assets that are most vulnerable to storm impacts. This study was accomplished through community outreach meetings with local officials to prioritize infrastructure needs in preparation for future storm events.

The GLO's Coastal Resources division operates the state's Coastal Erosion Planning and Response Act (CEPRA) program and the federal Coastal Management Program (CMP). These two programs offer funding opportunities to improve management of the state's coastal zone. Supplemented with funding allocated to the State of Texas through the Gulf of Mexico Energy Security Act (GOMESA), the CEPRA and CMP programs have been utilizing the Resiliency Plan to prioritize funding to implement the projects that are best suited to improve Texas coastal resiliency. CMP, GOMESA, and CDBG-DR funds were also utilized to aid in the production of the Resiliency Plan.

The Resiliency Plan has also been used to assist with informing the selection process for candidate projects to be implemented through the Texas portion of funding through the RESTORE Act – the funds available as a result of the settlement brought about after the Deepwater Horizon oil spill – by providing coastal stakeholder preferences gleaned from the Technical Advisory Committee to the RESTORE Council.

2.10.2 GOVERNOR'S COMMISSION TO REBUILD TEXAS

The destruction caused by Hurricane Harvey prompted a strong response from state lawmakers and political leaders. On September 7, 2017, Texas Governor Greg Abbott issued a proclamation creating the Governor's Commission to Rebuild Texas ("the Commission") to coordinate a statewide effort to help communities recover from Hurricane Harvey under the leadership of John Sharp, Chancellor of the Texas A&M University System (TAMUS).[404] The Commission's authorities and duties related to Hurricane Harvey recovery are broad, which put it in a unique position to influence disaster recovery reform efforts during Texas' 86th Legislative Session.

The Commission's report, 'Eye of the Storm' covered a wide range of disaster-related topics from debris removal to telecommunications. The report detailed a synopsis of the event and its impacts and a set of 44 policy recommendations for disaster response and recovery.[405] The Commission's report was significant as it detailed Governor Abbott's disaster-related policy priorities, many of which were signed into law during the 86th Legislative Session, reforming disaster response and recovery in Texas. The report is organized around the following key topic areas:

i. Agency Coordination;
ii. Communication;
iii. Disaster Services;
iv. Planning;
v. Mitigation and Resilience;
vi. Technology and Data; and
vii. Training.

2.10.3 TEXAS AT RISK REPORT

The GLO released its after-action report, 'Hurricane Harvey: Texas at Risk[406], on August 25, 2018, one year after Hurricane Harvey made landfall. The report was inspired by the GLO's experiences administering both the FEMA Direct Housing Mission and long-term CDBG disaster recovery programs in response to Hurricane Harvey and the lessons learned from it. The GLO was delegated the administration of the FEMA Direct Housing Mission, which aimed to place disaster survivors

[404] Governor Greg Abbott, "Proclamation," Governor's Commission to Rebuild Texas, September 7, 2017, https://www.rebuildtexas.today/proclamation/
[405] "Commission to Rebuild Texas Offers Post-Harvey Recommendations to Legislature," Office of the Texas Governor, Gregg Abbott, Press Release, December 13, 2018, https://gov.texas.gov/news/post/commission-to-rebuild-texas-offers-post-harvey-recommendations-to-legislature
[406] Andrew Natsios, "Hurricane Harvey: Texas at Risk," Texas General Land Office, George P. Bush, Commissioner, August 2018, http://www.glo.texas.gov/recovery/files/texas-at-risk-report.pdf

in temporary housing. Direct Housing Missions are traditionally managed by FEMA. This mission was the first time FEMA partnered with a state agency to implement temporary housing.

The report focuses primarily on disaster housing and mitigation as a means of protecting lives and property from future disasters. The report includes 18 detailed policy recommendations for all levels of government, including but not limited to:

i. Improving building code standards;
ii. Expanding legal flexibility to leverage innovative housing solutions;
iii. Strengthening capacity building for local disaster recovery managers; and
iv. Encouraging data-sharing between governmental entities to better assist disaster survivors.

2.10.4 86TH TEXAS LEGISLATURE

Hurricane Harvey's impact was geographically far-reaching and affected the districts of many state lawmakers, making disaster-related policy a high priority for many. Throughout the 86th legislative session, state lawmakers passed meaningful policy changes and made appropriations for disaster- and mitigation-related causes with potential impacts disaster recovery programs.

Following the release of the Eye of the Storm and Texas at Risk Reports, many state lawmakers filed bills based the policy recommendations during the 86th Legislative Session. The Legislature took significant action to make disaster-related appropriations from various sources, primarily from the Economic Stabilization Fund (ESF or "Rainy Day Fund"). Steps were also taken to ensure increased cooperation between state governmental entities involved with disaster response, recovery, and mitigation.

The following bills related to those state-level recommendations were signed into law:

2.10.4.1 *Business Advisory Council*

- **SB 799**—Alvarado: Relating to the creation of a business advisory council to provide advice on economic recovery following a disaster.[407]

[407] Texas Senate Bill 799, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB799/2019

2.10.4.2 *Flood Coordination and Planning*

- **SB 7**—Creighton: Relating to flood planning, mitigation, and infrastructure projects.[408]
- **SB 8**—Perry, et al: Relating to state and regional flood planning.[409]

2.10.4.3 *Disaster Recovery Institute for Training*

- **SB 6**—Kolkhorst: Relating to emergency and disaster management, response, and recovery.[410]

2.10.4.4 *Capacity Strengthening Program for City and County Recovery Managers*

- **HB 2305**—Morrison: Relating to a work group on enhancing the training and credentialing of emergency management personnel.[411]

2.10.4.5 *Flood Disclosures*

- **SB 339**—Huffman: Relating to a seller's disclosure notice for residential property regarding floodplains, flood pools, or reservoirs.[412]

2.10.4.6 *Integration and Support of Public and Private Sector Philanthropic Programs*

- **HB 3616**—Hunter: Relating to the establishment of a task force on faith-based programs that provide assistance during a disaster.[413]

2.10.4.7 *Disaster Programs Public Information Campaign*

- **SB 285**—Miles: Relating to information and outreach regarding hurricane preparedness and mitigation.[414]

[408] Texas Senate Bill 7, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB7/2019
[409] Texas Senate Bill 8, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB8/2019
[410] Texas Senate Bill 8, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB6/2019
[411] Texas House Bill 2305, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/HB2305/2019
[412] Texas Senate Bill 339, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB339/2019
[413] Texas House Bill 3616, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/HB3616/2019
[414] Texas Senate Bill 285, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB285/2019

2.10.4.8 *Indefinite Quantity Contracts*

- **SB 300**—Miles: Relating to indefinite quantity contracts for the provision of certain services to declared disaster areas following a natural disaster.[415]

2.10.4.9 *Suspension of Regulatory Statutes After a Disaster*

- **HB 7**—Morrison: Relating to disaster preparation for state agencies and political subdivisions.[416]

2.10.4.10 *Data Sharing/Disaster Case Management*

- **SB 6**—Kolkhorst: Relating to emergency and disaster management, response, and recovery.
- **HB 2330**—Walle: Relating to a study of an intake system and state case management system for state and federal disaster assistance.[417]
- **HB 2340**—Dominguez: Relating to emergency and disaster management, response, and recovery.[418]
- **HB 1307—**Hinojosa: Relating to the creation of a disaster case management system by the Texas Division of Emergency Management.[419]

2.10.4.11 *Mandated Task Forces and Study Groups*

- **HB 5**—Phelan, et al: Relating to debris management and other disaster recovery efforts.[420]
- **SB 289—**Miles: Relating to disaster recovery.[421]

[415] Texas Senate Bill 300, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB300/2019
[416] Texas House Bill 7, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/HB7/2019
[417] Texas House Bill 2330, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/HB2330/2019
[418] Texas House Bill 2340, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/HB2340/2019
[419] Texas House Bill 1307, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/HB1307/2019
[420] Texas House Bill 5, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/HB5/2019
[421] Texas Senate Bill 289, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB289/2019

- **HB 6**—Morrison, et al: Relating to disaster relief and recovery.[422]

2.10.4.12 *Disaster Committees*

- **HB 5**—Phelan, et al: Relating to debris management and other disaster recovery efforts.
- **HB 6**—Morrison, et al: Relating to disaster relief and recovery.
- **HB 2325**—Metcalf, et al: Relating to information and communication of governmental and other entities regarding disasters and health and human services.[423]
- **HB 2320**—Paul: Relating to services provided during and following a disaster.[424]
- **SB 982—**Kolkhorst: Relating to the provision of disaster and emergency services, including health care services, to certain populations.[425]
- **SB 984**—Kolkhorst: Relating to the suspension of certain local laws and property regulations by the governor during a declared state of disaster.[426]

2.10.4.13 *Reports, Plans, and Actions*

- **HB 5**—Phelan, et al: Relating to debris management and other disaster recovery efforts.
- **HB 6**—Morrison, et al: Relating to disaster relief and recovery.
- **HB 2325**—Metcalf, et al: Relating to information and communication of governmental and other entities regarding disasters and health and human services.
- **SB 289**—Miles: Relating to disaster recovery.
- **HB 2320**—Paul: Relating to services provided during and following a disaster.
- **SB 982**—Kolkhorst: Relating to the provision of disaster and emergency services, including health care services, to certain populations.

[422] Texas House Bill 6, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/HB6/2019
[423] Texas House Bill 2325, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/HB2325/2019
[424] Texas House Bill 2320, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/HB2320/2019
[425] Texas Senate Bill 982, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB982/2019
[426] Texas Senate Bill 984, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB984/2019

- **SB 986**—Kolkhorst: Relating to contract management standards and information for contracts related to emergency management.[427]
- **SB 563**—Perry: Relating to the reporting of information about the use of federal money for flood research, planning, and mitigation projects.[428]
- **HB 2794**—Morrison, et al: Relating to the administration of emergency management in this state.[429]

2.10.4.14 *Senate Bill 7*

With the passage of Senate Bill 7, the Texas Legislature established the Texas Infrastructure Resiliency Fund (TIRF). Almost $1.6 billion is appropriated from the ESF to establish the TIRF legislation.

The TIRF, which will be administered by the Texas Water Development Board (TWDB) and overseen by the Texas Infrastructure Resiliency Fund Advisory Committee ("advisory committee"). Additionally, four accounts will be established under TIRF:

- Floodplain Management Account;
- Hurricane Harvey Account;
- Flood Plan Implementation Account; and
- Federal Matching Account.

2.10.4.15 *Floodplain Management Account*

This account provides funds for the TWDB to finance its functions to "aid, advise, and coordinate the efforts" of political subdivisions' participation in FEMA's National Flood Insurance Program (NFIP). This account also provides the TWDB financing for "any other activities" related to collecting flood information, flood planning, protection and mitigation, and outreach.

2.10.4.16 *Hurricane Harvey Account*

This account provides funds for the TWDB to finance flood projects related to Hurricane Harvey by making grants or low-interest loans to political subdivisions to provide matching funds for federal program participation, cover state and federal regulatory costs, and develop a hazard mitigation plan.

[427] Texas Senate Bill 986, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB986/2019
[428] Texas Senate Bill 563, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB563/2019
[429] Texas House Bill 2794, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/HB2794/2019

Additionally, the bill requires that the TWDB "establish a point system for prioritizing flood projects for which money from the Hurricane Harvey Account is sought," giving higher priority to projects that will have a "substantial effect." Those projects that will have a "substantial effect" include those that:

- Are recommended or approved by the director of TDEM or the successor in function to that entity; and
- Meet an emergency need in a county where the governor has declared a state of disaster.

The TWDB can approve an application for financial assistance from TIRF that meets its criteria after approval from its executive director with input from the director of TDEM or the successor in function to that entity. This fund is set to expire on September 1, 2031 with the remaining balance to be transferred to the Flood Plan Implementation Account.

2.10.4.17 *Flood Plan Implementation Account*

This account is set up very similarly to the Hurricane Harvey Account described above, but is more inclusive in its description of flood projects "that will have a substantial effect" to include those that:

- Are funded partially through federal matching funds;
- Include a component that will increase water supply; and
- Contain any other factor the board deems relevant to resiliency.

It is likely this bill sets up the Flood Plan Implementation Account and Hurricane Harvey Account separately to expand its scope to cover projects relating to Hurricane Harvey and those associated with future disasters. The TWDB may use this account only to provide financing for projects included in the State Flood Plan and money from this account may be award to several eligible political subdivisions for a single flood project.

2.10.4.18 *Federal Matching Account*

This account can only be used by the TWDB to meet matching requirements for projects that are funded partially by the U.S. federal government, including those funded by USACE.

2.10.4.19 *The Advisory Committee*

The TIRF and its accounts will be overseen by the advisory committee, which is comprised of the same seven members that sit on the State Water Implementation Fund for Texas (SWIFT) Advisory Committee and the director of TDEM or the successor in function to that entity. The committee is comprised of the Texas Comptroller of public accounts, three state senators appointed by the lieutenant governor and three state representatives appointed by the House speaker. The co-

presiding officers of SWIFT's committee will be the co-presiding officers of the proposed advisory committee for TIRF, and the director of TDEM or the successor in function to that entity will serve as a non-voting member. The advisory committee's primary responsibility is to oversee the operation, function, and structure of TIRF, with the authority to adopt rules, procedures and policies to guide its use by the TWDB.[430]

Senate Bill 7 also creates the Flood Infrastructure Fund (FIF) as a special fund in the state treasury outside the general revenue fund contingent on the approval of a constitutional amendment by voters in November 2019.

The bill would allow the TWDB to use the fund only:

- To make a loan to a political subdivision at or below market interest rates for a flood project;
- To make a grant or low- or zero-interest loan to an eligible political subdivision for a flood project to serve an area outside a metropolitan statistical area or an economically distressed area;
- To make a loan at or below market interest rates for planning and design costs, permitting costs, and other costs associated with state or federal regulatory activities related to a flood project;
- To make a grant to a political subdivision to provide matching funds for participation in a federal program for a flood project;
- As a source of revenue or security for the principal and interest payment on bonds issued by TWDB for purposes of the fund, if the bond proceeds would be deposited in the fund; and
- To pay the expenses of TWDB in administering the fund.[431]

2.10.4.20 *State Flood Plan*

Senate Bill 8 calls for the creation of a State Flood Plan (the Plan) to be prepared by the TWDB every 5 years. The bill requires the TWDB to "designate flood planning regions to each river basin." The flood planning groups in each region are tasked with creating a regional report that will be compiled in the State Flood Plan.

[430] Texas Senate Bill 7, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB7/2019
[431] "Bill Analysis, SB 7," House Research Organization, May 16, 2019, https://hro.house.texas.gov/pdf/ba86r/sb0007.pdf

The designated state agencies, including the GLO, are required to appoint a representative to serve as an "ex officio" member of each flood planning group (each river basin) established by the bill. The primary responsibility of these groups is to use flood-related information to identify problems and propose solutions for their respective regional report.[432]

The Plan (first due by 2024) will include a(n):

- Evaluation of the condition and adequacy of flood control infrastructure on a regional basis;
- Statewide, ranked list of ongoing and proposed flood control and mitigation projects and strategies necessary to protect against the loss of life and property from flooding and a discussion of how those projects and strategies might further water development, where applicable;
- Analysis of completed, ongoing, and proposed flood control projects included in previous state flood plans, including which projects received funding;
- Analysis of development in the 100-year floodplain areas as defined by FEMA; and
- Legislative recommendation the TWDB considers necessary to facilitate flood control planning and project construction.

2.10.4.21 *Senate Bill 500*

Senate Bill 500, a major supplemental appropriations bill, would appropriate almost $2.8 billion from the Economic Stabilization Fund (ESF) for disaster recovery, including an $793 million to the TWDB to complete flood projects not covered by FEMA's flood mitigation funding should the November ballot provision pass.[433]

Funds appropriated under Senate Bill 500 will go to state agencies for Hurricane Harvey relief, Medicaid, state employee retirement, and other purposes. Approximately $2.8 billion of these funds will be appropriated from the ESF and dedicated to expenses related to Hurricane Harvey, including:

- $1.54 billion to the Texas Education Agency's Foundation School Program and other costs related to Hurricane Harvey;
- $61.4 million to public higher education institutions for Hurricane Harvey-related expenses;

[432] Texas Senate Bill 8, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB6/2019

[433] "Governor Abbott Signs Disaster Relief and Preparedness Legislation into Law," Office of the Texas Governor, June 13, 2019, https://gov.texas.gov/news/post/governor-abbott-signs-disaster-relief-and-preparedness-legislation-into-law

- $673 million to TDEM for matching funds for FEMA programs;
- $245.6 million to Health and Human Services Commission, Texas Department of Criminal Justice, and the Texas Department of Public Safety (DPS) to replace funds diverted from these agencies to disaster assistance related to Hurricane Harvey;
- $227.8 million to the GLO for the removal of vessels and structural repairs, full-time employees to build short-term housing in the absence of federal grants, and state matching funds for studies and projects planned by USACE;
- $17 million to the Texas Parks and Wildlife Department for necessary structural repairs related to damage from Hurricane Harvey; and
- $8.9 million to the Texas Workforce Commission for hurricane-related expenses.[434]

2.10.4.22 *Senate Bill 289*

Senate Bill 289 created a local housing recovery plan framework to help local jurisdictions be more prepared for permanent housing construction and reconstruction following a disaster. The bill encourages, but does not require, that local jurisdictions develop housing recovery plans and submit them to the Hazard Reduction and Recovery Center at Texas A&M University (the Center) for certification. Once certified by the Center, the GLO is required to review the plan and consult with the Center and relevant local jurisdiction to ensure it meets the criteria established in the bill and either accept or deny the plan.[435] In effect, the bill codifies increased coordination between local jurisdictions, TAMUS, and the GLO to help communities better prepare for housing recovery.

[434] Texas Senate Bill 500, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB500/2019
[435] Texas Senate Bill 289, Enrolled, 86th Legislature Regular Session, 2019-2020, LegiScan, https://legiscan.com/TX/text/SB289/2019

2.10.5 STATE STUDIES

Over the last several years, the state of Texas has been conducting a variety of efforts to plan for flooding and mitigate from future disasters. As noted above and below, the state has begun to take larger strides to work toward mitigation. Below is a brief summary of planning efforts not only at the GLO, but in other agencies across the state.

2.10.5.1 *Texas Water Development Board's State Flood Assessment and State Flood Plan*

As stated through this Action Plan, in January 2019, the Texas Water Development Board (TWDB) published its *State Flood Assessment* for the state legislature. The report provides an initial assessment of flood risks, an overview of roles and responsibilities, an estimate of flood mitigation costs, and a synopsis of stakeholder views on the future of flood planning, mitigation, warning, and recovery. Additionally, the upcoming 2024 TWDB State Flood Plan (the Plan) will be based on regional flood plans developed by local stakeholders. It will focus on evaluating existing flood infrastructure and will include a statewide-ranked list of ongoing and proposed flood control and mitigation projects and strategies. The Plan will also include an analysis of development in the 100-year floodplain as defined by FEMA. In addition, the Plan will recommend legislative policy changes needed to facilitate planning and project implementation. Furthermore, a large part of the planning effort will include developing models and other technical tools that will assist local decisionmakers in evaluating potential solutions to flood issues.

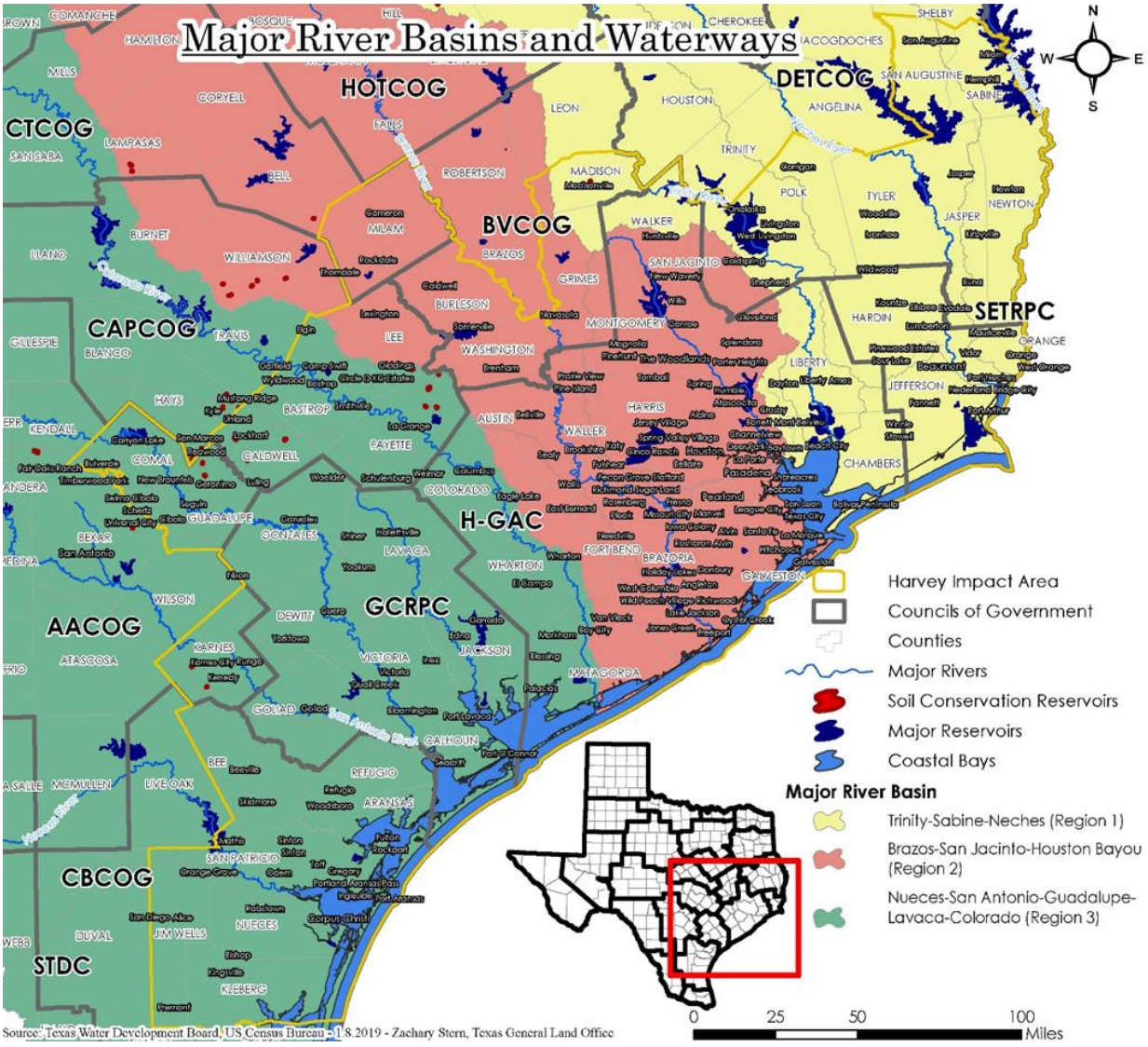
2.10.5.2 *GLO Flood Studies within Combined River Basins*

From the $5.676 billion CDBG-DR funds awarded to the state of Texas after Hurricane Harvey, approximately $137 million was allocated toward funding planning studies, to help communities make informed decisions through the long-term recovery process and better prepare for future disasters. An unprecedented decision was made to retain this funding at the GLO and utilize it for regional studies. Previously, the majority of planning studies completed using allocated CDBG-DR funding were completed at the local level; however, the results of the studies were often counter-productive, as effort was not made to incorporate surrounding communities, thus sometimes alleviating one issue only to cause additional problems outside the study area.

During the first half of 2018, the GLO Community Development and Revitalization Research and Development team developed a list of planning study needs through public outreach efforts directed toward the 49 counties that received a presidential disaster declaration resulting from Hurricane Harvey. Outreach consisted of attending public meetings, accepting study topics through the general CDR email, and an online survey for elected officials representing the affected communities. The close of the survey in September 2018 formally concluded public outreach, at which time all responses were sorted, reviewed, and responded to. After vetting responses, the primary identified study need was flood control.

In consultation with the Center for Space Research at UT Austin, and after reviewing TWDB's *State Flood Assessment*, the GLO determined that regionalization of the planning studies should be based on Texas' major river basins (see the map below). To limit the total number of regional studies, river basins located within the Impacted Areas were combined, creating a total of three regional flood studies (see below map). Each regional study will take a holistic approach by looking at the entirety of the combined river basins (from their origin in North Texas to their output in the Gulf of Mexico). The reasoning behind this approach is that flood events and development upstream of the Impacted Areas often have a direct impact and contribution to flooding downstream. Multiple one-on-one and group meetings were conducted with state and federal agencies identified as stakeholders to discuss and refine the project scope. Identified stakeholders include but are not limited to: Texas A&M AgriLife Extension (AgriLife), Federal Emergency Management Agency (FEMA), GLO-Coastal, National Oceanic and Atmospheric Administration (NOAA), National Weather Service (NWS), Texas Division of Emergency Management (TDEM), Texas Natural Resources Information System (TNRIS), TWDB, Texas Department of Transportation (TxDOT), United States Army Corps of Engineers (USACE), and United States Geological Survey (USGS). Efforts are ongoing to continue coordination with the current stakeholders, as well as identify additional stakeholders. Local outreach is included in the scope of the project and will be handled separately for each region through the councils of governments (COGs) and river authorities.

Figure 2-74: Coastal River Basins and Waterways



2.10.5.3 *Coastal Texas Protection and Restoration and Feasibility Study*

Conducted in partnership with the GLO, the Coastal Texas Protection and Restoration and Feasibility Study is a long-term comprehensive coastal planning effort focused on coastal storm risk management and ecosystem restoration. As of late 2018, USACE has narrowed its list of viable projects to several storm risk management scenarios that provide a barrier system for the Houston-Galveston and Galveston Bay region, plus a suite of shoreline protection and habitat restoration projects along the Texas coast. Additionally, USACE will study the Buffalo Bayou and its tributaries, as well as the Houston Regional Watershed Assessment to determine solutions for local flood issues. Other USACE studies will consider resiliency solutions for the Brazos River in Fort Bend County and for the Guadalupe and San Antonio river basins.

2.10.6 Additional Hurricane Harvey Studies

In addition to the proposed regional flood studies, four other planning studies that utilize Hurricane Harvey funding (excluding the previously mentioned studies that use a combination of funding from Hurricanes Ike and Harvey, and 2016 Floods) are either ongoing or soon to begin. The following is a list and brief summary of each study.

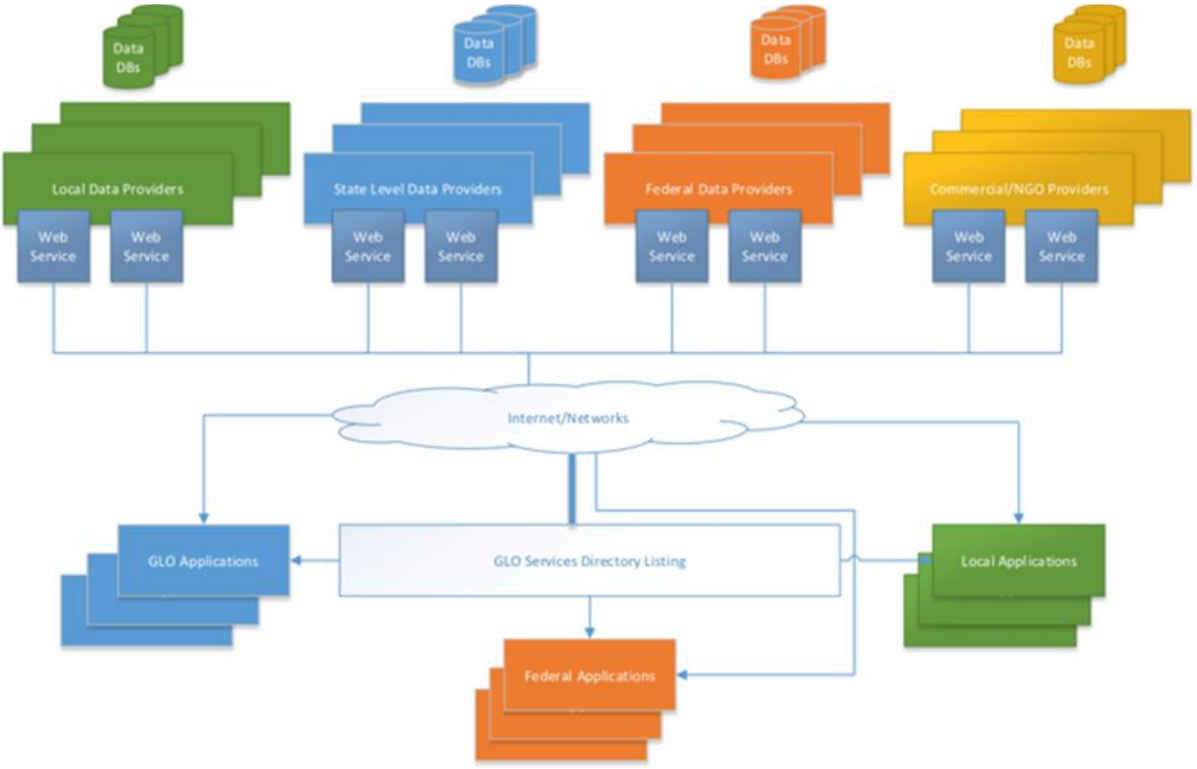
2.10.6.1 *Hurricane Harvey Housing Impacts: 49 County Survey Top-line Findings*

In June 2018 the Bureau of Business Research (BBR), an organized research unit of the IC2 Institute at The University of Texas at Austin, was asked by the GLO to prepare and administer a survey of unmet housing needs among community members and victims of the 49 Texas counties affected by Hurricane Harvey. The results of the survey, which was concluded in July 2018, helped the GLO determine the most appropriate type of housing assistance and method of communication with community members as it disburses CDBG-DR funds in impacted counties.

2.10.6.2 *Disaster Recovery and Mitigation Data Management Plan*

In June 2019, the University of Texas at Austin (UT) was selected to help the GLO design and deliver a database capable of housing and securing the state's disaster data needs. UT will assist the GLO to establish the necessary framework and processes to collect, organize, process, analyze, and distribute disaster data for the state of Texas. The disaster database is a critical tool that will assist communities in the development of better disaster response, recovery and mitigation plans. Through the GLO's planning efforts, Texas A&M University Systems was identified as the ideal long-term partner to house the disaster database.

Figure 2-75: Database Design



2.10.6.3 *Economic Development Strategy and Diversification Study*

The purpose of this study, which should begin Fall 2019, is to develop strategies to expand the economy of coastal counties impacted by Hurricane Harvey beyond tourism to make them more resilient to future impacts while recovering. The need for the project is that Hurricane Harvey had a devastating effect on the primary economic source of revenue, tourism, for multiple counties along the Texas coastline. The study will specifically address deficiencies in the workforce and lost businesses.

2.10.6.4 *Disaster Recovery Alternative Housing Study*

This study, beginning Fall 2019, will analyze and evaluate alternative housing options to determine if innovative solutions exist for accommodating disaster survivors, including those with low to moderate incomes, that are cost-effective, prudent, secure, and allow for faster construction. The study, as currently proposed, consists of two phases. In the first phase, Research and Development, the selected Provider will gather, analyze, and evaluate data relating to the resiliency of alternative housing options during extreme weather events to identify innovative solutions for sheltering disaster survivors that are cost-effective, safe, secure, and allow for expedited construction. Phase 2 will build upon the results of Phase 1 and involves the development of prototypes for several agreed-upon solutions and testing for feasibility of the prototypes during extreme weather events.

2.10.7 Other GLO Studies and Initiatives

Prior to Hurricane Harvey, planning studies were included in the Infrastructure program and were locally run, with a few exceptions. Utilizing a portion of the funds allotted for planning studies from the Hurricane Ike award, multiple studies are ongoing or recently completed. The following is a summary of the studies.

2.10.7.1 *Disaster Impact Visualization Study*

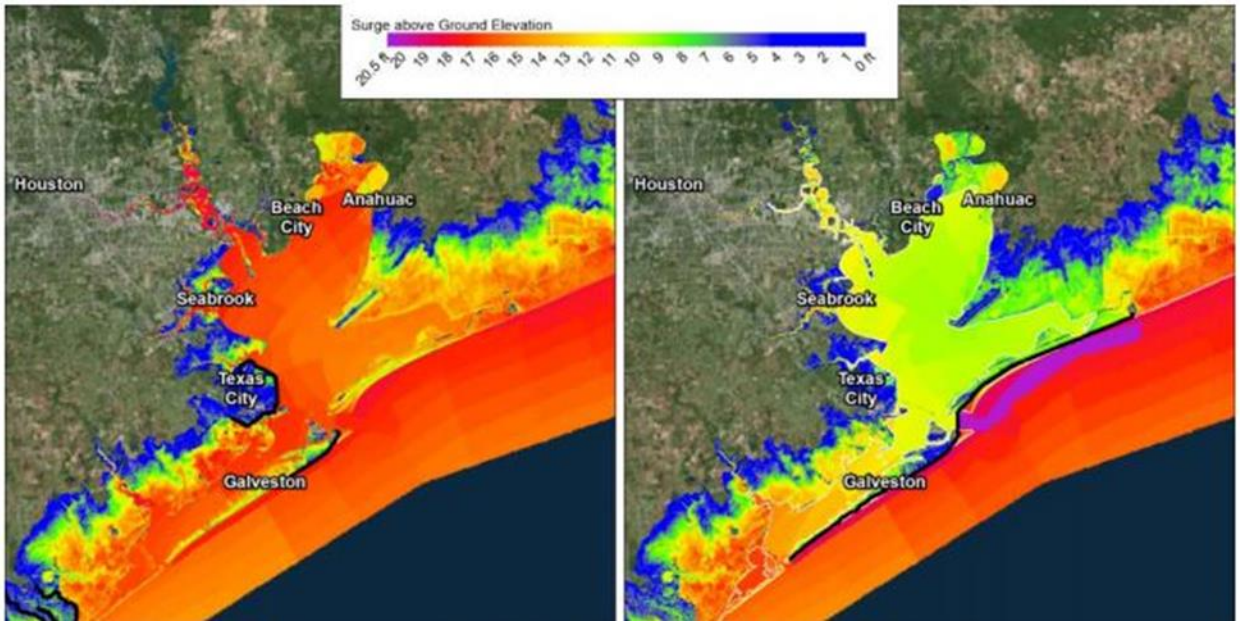
Through a partnership with The University of Texas' Center for Space Research, the GLO is utilizing planning study funds from Hurricanes Ike and Harvey, as well as 2016 Floods, to continue to build real-time visualizations of critical disaster data, including the Public MOVES Viewer, displaying historical satellite imagery from Hurricane Harvey and other events, giving communities the ability to observe events and make more informed planning decisions.[436]

2.10.7.2 *Gulf Coast Community Protection and Recovery District (GCCPRD)*

In 2013, GLO entered into an agreement with the GCCPRD to develop a storm surge suppression study in accordance with USACE standards. The study area consisted of the coastal areas around Brazoria, Chambers, Galveston, Harris, Jefferson, and Orange counties that could be impacted by future storm events. The study, which investigated options for reducing the vulnerability of the upper Texas coast to hurricane surge and flood damages, was completed in December 2018.[437]

[436] MOVES (Modeling, Observation and Visualization for Emergency Support), Center for Space Research, University of Texas at Austin, accessed October 4, 2019, http://magic.csr.utexas.edu/public/views/
[437] Gulf Coast Community Protection and Recovery District (GCCPRD), accessed October 4, 2019, https://gccprd.com

Figure 2-76: Surge reduction 100-year event in 2085.



2.10.7.3 *Evaluating the Effects of a Coastal Spine: National-Level Economic Ripple Effects of Storm Surge Events*

In September 2017, the GLO utilized remaining Hurricane Ike funds to commission a study comprehensively assessing a coastal storm suppression system (aka coastal spine) proposed as a mitigation strategy. The report presents the results of a nation-wide economic study of storm surge impacts on the three counties along the Galveston Bay (Galveston, Harris, and Chambers) and explores how direct impacts on a specific sector(s) in bay communities affect the economy of TX as well as economies of other states and the nation as a whole in the long =-term, while capturing general equilibrium and multiplier effects. The project was completed in May 2019.[438]

2.10.7.4 *Regional Drainage Data Collection and Oversight*

Through a competitive bid process, the University of Texas-San Antonio (UTSA) was awarded a contract in April 2019 to gather and organize data focusing on regional oversight and the coordination of the drainage infrastructure in Hardin, Jasper, Jefferson, Newton, Orange, Tyler, Polk, Liberty, and Chambers Counties. They will perform community outreach activities, collect and analyze existing data, and inform local communities and community leaders, on behalf of the GLO, of recommended actions to take based on the data analysis. The study is expected to be completed by December 2019.

[438] *Evaluating the Effects of a Coastal Spine: National-Level Economic Ripple Effects of Storm Surge Events*, Center for Texas Beaches and Shores, Texas A&M University at Galveston, https://recovery.texas.gov/files/programs/planning/coastal-spine-report.pdf

2.10.8 Federal, State, and Local Coordination & Mitigation Alignment

The GLO has been working with a variety of federal, state, and local partners. Given the geography of the 140-county area in Texas with its urban/rural diversity, the GLO worked to address needs and communications through a variety of channels. From an online mitigation survey to teleconference calls with councils of governments and multiple presentations across the state, the GLO has worked diligently to conduct regional and localized coordination and has aligned CDBG-MIT programs to complement and enhance the state's mitigation efforts. Below is a summary of efforts taken with the GLO's federal, state, and local partners.

2.10.8.1 *Federal Coordination*

Federal Emergency Management Agency

The GLO began working with the Federal Emergency Management Agency (FEMA) almost immediately following Hurricane Harvey in 2017. The GLO has had a solid presence at the Texas Recovery Office (TRO) previously the Joint Field Office. The GLO is in charge of the short-term housing mission for the state in partnership with FEMA.

The GLO has regular mitigation meetings at the TRO with FEMA, TDEM, and the TWDB to go over the status of projects and other mitigation efforts.

The Hazard Mitigation branch and their Floodplain Management & Insurance section in particular assisted communities with damage assessment and conducted substantial damage assessments. This mitigation branch conducts NFIP information campaigns, community education and outreach, assists communities in identifying and developing opportunities for mitigation, and assisted TDEM in reviewing local mitigation plans to ensure jurisdictions were eligible for Harvey HMGP funding.

U.S. Environmental Protection Agency

Through the U.S. Environmental Protection Agency (EPA) and its Urban Waters Federal Partnership, the GLO has played a role in their workshops to deliver important information to local communities looking to mitigate from future disasters. The Urban Waters Federal Partnership connects communities, particularly those that are overburdened or economically distressed, with their area stakeholders by improving coordination among federal agencies and collaborating with community-led revitalization efforts to improve the Nation's water systems and promote economic, environmental and social benefits. The EPA partnership works to break down federal program silos to promote more efficient and effective use of federal resources through better coordination and targeting of federal investments; recognize and build on local efforts and leadership, by engaging and serving community partners. Over the last year, the GLO has attended and presented at approximately 5 EPA workshops across Texas.

U.S. Economic Development Administration

The GLO has been working with the U.S. Economic Development Administration (EDA) and has provided regular CDBG-MIT updates on its monthly Disaster Recovery Manager (DRM) calls—these DRM positions have been put in place through grant funds from the EDA to assist in the recovery following Hurricane Harvey, and are hired and managed by regional councils of governments. Additionally, the GLO participated in a regional EDA workshop to highlight the upcoming CDBG-MIT funds and inform local officials of the state's mitigation efforts.

2.10.8.2 *State Coordination*

State Hazard Mitigation Team

When planning for state mitigation, it is important to involve a cross-section of stakeholders, particularly in the development of the State of Texas Hazard Mitigation Plan (SHMP). This includes the State Hazard Mitigation Team (SHMT), composed of representatives from state agencies, local and regional representatives, and non-governmental organizations with an interest in hazard mitigation. SHMT members (1) provide program and funding information; (2) identify mitigation strategies and opportunities, as well as actions taken since the previous State Hazard Mitigation Plan was approved; (3) contribute subject matter expertise on hazard assessments; and (4) comment on draft versions of the SHMP. Additionally, the SHMT evaluates both mitigation projects and funds across the state, as well as mitigation data and hazard information.

The SHMP requires regular review and evaluation; this is coordinated through the Texas Division of Emergency Management with the SHMT to ensure proper implementation, and to ensure that objectives are met and information regarding accomplishments and new initiatives are captured consistently. The GLO has three representatives (one from the Coastal division and two from the Community Development and Revitalization division) on the SHMT.

Texas Division of Emergency Management

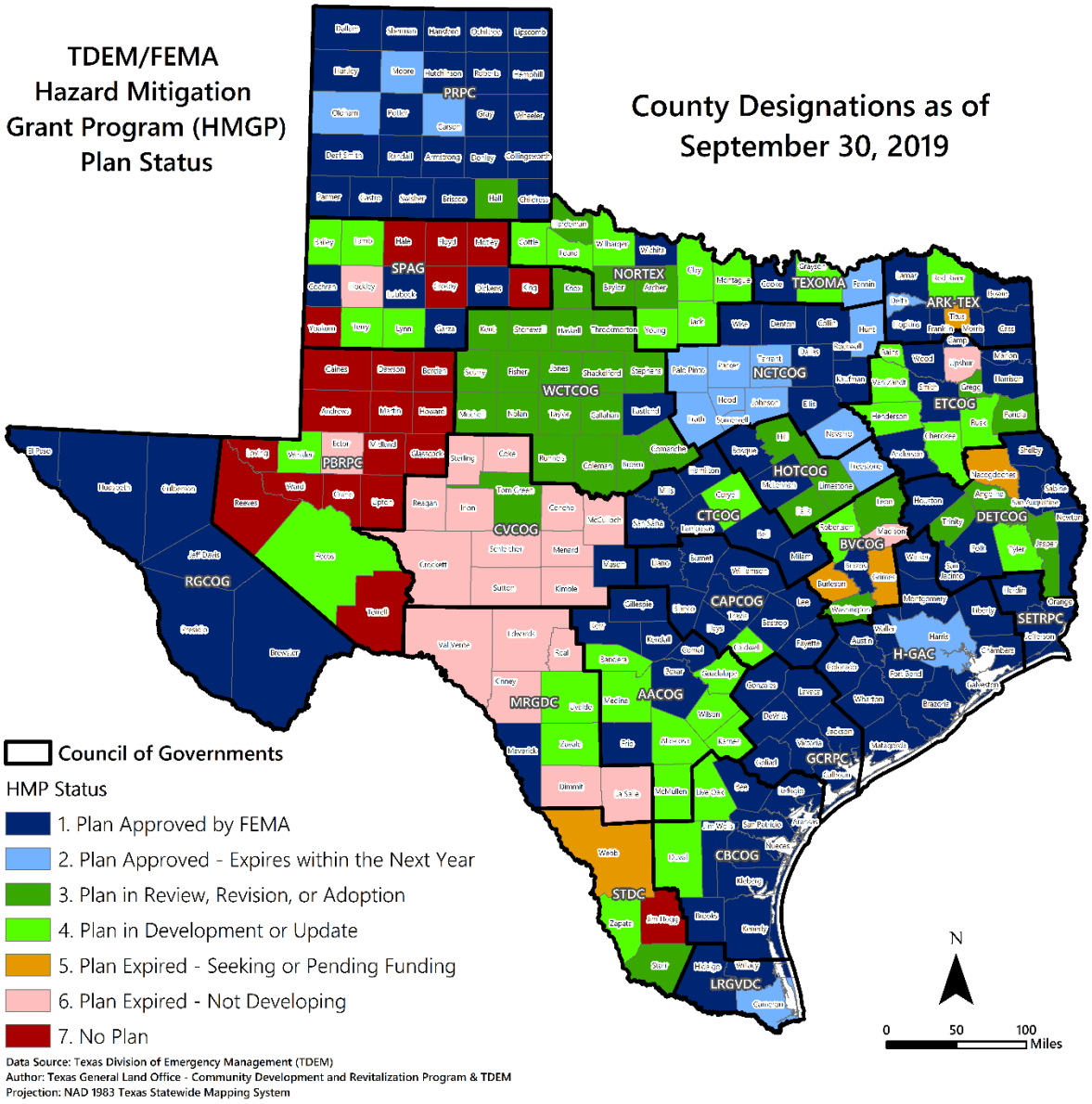
The GLO has been working with the Texas Division of Emergency Management (TDEM) since late 2018 regarding mitigation on a consistent basis; in particular, with the State Hazard Mitigation Officer (SHMO) and the Hazard Mitigation Unit (the Mitigation Unit). The SHMO and the Mitigation Unit are in charge of a variety of efforts across the state. They are the state entity currently responsible for authoring and updating the SHMP.[439] TDEM's Preparedness Unit develops the state's Emergency Management Plan.[440]

[439] *State of Texas Hazard Mitigation Plan*, Texas Division of Emergency Management, October 2018, http://tdem.wpengine.com/wp-content/uploads/2019/08/txHazMitPlan.pdf
[440] Ibid.

The Mitigation Unit focuses on reducing future disaster losses in Texas through the implementation of a variety of risk-reduction strategies. The group provides expertise and technical assistance in mitigation planning and in community administration of FEMA Hazard Mitigation Grant Program (HMGP) funds. This unit includes a headquarters element staffed by planners and mitigation grant coordinators responsible for the statewide implementation of the program. This unit also depends on regional mitigation grant coordinators which report to the regional TDEM assistant chiefs. These field staff work directly with local jurisdictions and sub-applicants to develop hazard mitigation projects and to assist sub-applicants in developing and managing mitigation grant applications as well as their Local Hazard Mitigation Plans (LHMPs) that are developed and submitted to FEMA on a rolling basis (see figure below).[441]

[441] Ibid.

Figure 2-77: County Hazard Mitigation Plan Status by County



The Mitigation Unit provides the strategic vision, expressed in the SHMP, for efforts to reduce the long-term risk to Texas communities from all hazards. The SHMP is informed by LHMPs and SHMT research while providing strategic guidance and statewide hazard risk assessments on hazard mitigation activities to state agencies and local governments.

TDEM's Preparedness Unit mission in developing the Emergency Management Plan (EMP) is to support and enhance the state's preparedness by developing and managing a comprehensive, all-hazards emergency operations plan that clarifies roles and helps coordinate resources before, during, and after an incident of state significance. The EMP consists of a Basic Plan, functional

annexes in a variety of support functions, hazard annexes, and other support documents. Additionally, TDEM administers FEMA's Pre-Disaster Mitigation (PDM) program, which will be changing over to the Building Resilient Infrastructure and Communities (BRIC) program in 2020, as well as the FEMA Public Assistance (PA) program and Hazard Mitigation Grant Program (HMGP).

To appropriately align with strategic mitigation efforts across the state, the GLO met with the Mitigation Unit starting in 2018 specifically to address the CDBG-MIT funding stream that Texas would be receiving. During these initial meetings, the GLO and the Mitigation Unit discussed the respective roles, responsibilities, and programs that each engages with. The Mitigation Unit is in charge of providing technical assistance for and reviewing Local Hazard Mitigation Action Plans, as well as authoring and updating the State of Texas Hazard Mitigation Plan. The SHMO and the Mitigation Unit meet regularly alongside FEMA and the TWDB with the GLO to inform them of project status as it relates to respective programs and the CDBG-DR programs and projects.

The Mitigation Unit is currently working to develop an *enhanced* SHMP. As detailed in the Use of Funds section of this Action Plan, the GLO will be partnering with TDEM to provide assistance in the development of the enhanced SHMP. The benefit of an enhanced plan versus a standard one is an increase in the HMGP fund amount from 15 percent of a state's total FEMA disaster grant award to 20 percent of the total disaster grant award.[442]

Additionally, this CDBG-MIT funding will help finance local community efforts to build out their LHMPs. The GLO will also be working with TDEM on the identification of projects for funding under the HMGP Supplemental program.

Texas Water Development Board

Created in 1957, the mission of the Texas Water Development Board (TWDB) is to provide leadership, information, education, and support for planning, financial assistance, and outreach for the conservation and responsible development of water in Texas. Its mission is a vital part of Texas' overall vision and the state's mission and goals that relate to maintaining the viability of the state's natural resources, health, and economic development.

To accomplish these goals, the TWDB provides water planning, data collection and dissemination, financial assistance, and technical assistance services. Currently the TWDB supports the development of regional water plans; provides loans to local governments for water supply projects including flood control projects; provides grants and loans for the water and wastewater needs of

[442] The HMGP fund amount available to a state, tribe, or territory is always a percentage of the total of FEMA's disaster grant assistance provided to a state following a Presidential disaster declaration. See FEMA's HMGP FAQ section, "How Much Money Is Available in the Hazard Mitigation Grant Program?" https://www.fema.gov/hmgp-faqs

the state's economically distressed areas; provides agricultural water conservation and water-related research and planning grants; maintains a centralized data repository of information on the state's natural resources called the Texas Natural Resources Information System[443] (TNRIS); and manages the Strategic Mapping[444] (StratMap) initiative, among other statewide efforts. A full-time, three-member board appointed by the governor considers loan applications from eligible applicants, awards grants for water-related research and planning, and conducts other TWDB business such as approving the state water plan.

Using funding allocated by the 85th legislature, the TWDB developed the State Flood Assessment.[445] This report provides an initial assessment of Texas' flood risk, an overview of roles and responsibilities, an estimate of flood mitigation costs, and a synopsis of stakeholder views on the future of flood planning in the state. However, it does not seek to fund specific strategies or projects related to flood planning, mitigation, warning, or recovery. Preliminary findings summarized in the assessment are derived from stakeholder input and are organized according to three key pillars of comprehensive flood risk management: (1) mapping, (2) planning, and (3) mitigation.

Since 2007, the TWDB has been the designated state agency tasked with coordinating the National Flood Insurance Program (NFIP) within Texas. In this capacity the TWDB acts at the liaison between the federal component of the program and local communities, with the primary duty to provide guidance, outreach and education to the communities to assist in meeting the federal eligibility requirements for entrance into the NFIP and also assist the communities with maintaining their participating status.

The TWDB administers the Flood Protection Grant Program, which provides up to 50 percent state financial assistance to political subdivisions to: (1) conduct feasibility studies for an entire watershed to evaluate both structural and nonstructural solutions to flood hazards within the watershed; (2) engage in planning for or implementation of Flood Early Warning System(s); or (3) engage in planning for or implementing a Flood Response Plan. Additionally, the TWDB administers Flood Mitigation Assistance grants through the FEMA program that provides communities with up to 100 percent federal funds for cost-effective measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP.

As detailed in this Action Plan, Senate Bill 8 calls for the creation of watershed-based Regional Flood Plans by January 2023 and the first State Flood Plan by September 2024. The state plan will

[443] Texas Natural Resources Information System (TNRIS), Texas Water Development Board, https://tnris.org/
[444] Texas Strategic Mapping (StratMap), TNRIS, Texas Water Development Board, https://tnris.org/stratmap/
[445] "State Flood Assessment, Report to the Legislature, 86th Legislative Session," TWDB, January 2019, http://www.texasfloodassessment.com/doc/State-Flood-Assessment-report-86th-Legislation.pdf

be prepared by TWDB every 5 years in consultation with Regional Flood Planning Groups as well as TDEM, TCEQ, the State Soil and Water Conservation Board, the Texas Department of Agriculture, Texas Department of Parks and Wildlife, and the GLO. A related bill, Senate Bill 7, created two new funds to be administered by the TWDB: The Flood Infrastructure Fund (FIF) and the Texas Infrastructure Resiliency Fund (TIRF).

The GLO is continually working to align flood mitigation efforts to be appropriately in step with the upcoming state flood planning process.

Texas A&M University System

The Texas A&M University System (TAMUS) has become a valuable partner during the development of the state's long-term recovery and mitigation efforts. This system is one of the largest higher education institutions in the nation will a budget over $6.3 billion and 11 universities and multiple state agencies. Currently, the GLO is partnering with the Texas A&M Forest Service, the Texas A&M AgriLife Extension, and other extension services.

A major partner over this period has been the through the AgriLife Extension and their Texas Community Watershed Partners. The Texas Community Watershed Partners (TCWP) provides education and outreach to local governments and citizens on the impacts of land use on risk reduction, watershed health and water quality. The TCWP operates on the Land Grant model of integrated university research, education, and extension. They engage the resources of Texas A&M University, and other universities in Texas and across the country, to put the tools of sustainability and resilience into the hands of Texas' citizens. They further engage the research platforms of these universities to help solve critical issues. Additionally, the AgriLife Extension service has representatives in all 254 counties in Texas, providing the potential for direct localized outreach through these representatives.

The TCWP has worked to develop the Community Health and Resource Management (CHARM) GIS mapping application. This application gives local officials, stakeholders, and citizens the power to map and analyze current risks and growth with real-time feedback. When used with additional hardware, CHARM forms a powerful and interactive planning tool for engaging the public and gathering their values about the community's future. The mapping application is supported with a library of mapping data about urbanization, natural hazards, critical facilities, and natural resources. The CHARM application can leverage local community knowledge for better long-term planning, and is an ideal tool for communities, local agencies, and project teams. It is during CHARM workshops that this hardware and application come together to inform local communities and decision makers in identifying planning impacts and risk reduction opportunities and strategies.

Through the exploration of the state's mitigation efforts, the TCWP and their CHARM service was identified as potential partners. The GLO engaged TCWP and have now established a solid

relationship where collaboration and coordination help align, not only statewide mitigation objectives, but hyper-localized mitigation planning and disaster preparation. The GLO looks forward to further partnership with TCWP and has begun the integration of their tools to reach the variety of CDBG-MIT eligible counties across the state.

In addition to the TCWP, TAMU has a variety of other institutes, programs and research that align with the GLO's mission. These include:

- Hazard Reduction and Recovery Center (HRRC): HRRC is an interdisciplinary institute of architects, planners, sociologists, policy analysts, economists, landscape architects, and engineers; these researchers focus on hazard analysis, emergency preparedness and response, disaster recovery, and hazard mitigation. HRRC aims to increase the understanding of the impacts that hazards have on humans and the environment through their research.
- Texas Target Communities: This service-learning program provides planning services to Texas communities including technical assistance, training, and public engagement workshops. Faculty and students partner together to provide these services with the aim to create sustainable communities across Texas.
- The Institute for Sustainable Communities: Similar to the HRRC, the Institute for Sustainable Communities aims to produce transformative research that offers solutions for more sustainable and vibrant communities. They helped author *Beyond the Basics: Best Practices in Local Mitigation Planning*, which provides advice to local communities on how to write effective Hazard Mitigation Plans.
- Community Resilience Collaborative: This collaborative is between the Texas Sea Grant College Program and Texas Target Communities. The Collaborative provides small grants for resiliency research and provides technical assistance for planning, outreach, and education aimed at coastal communities, particularly resource managers, land use planners, and emergency managers who deal with hazard mitigation.

TAMU represents just one of the varieties of current and potential partnerships the GLO hopes to strengthen or form with higher education institutions throughout Texas.

Texas Water Infrastructure Coordination Committee

The Texas Water Infrastructure Coordination Committee (TWICC) provides information on funding eligibility or technical assistance to water systems facing infrastructure or compliance issue and has taken a stronger role in helping communities across the state access both disaster recovery and mitigation funding. TWICC is a collaborative effort by state and federal government agencies and technical assistance providers promoting an efficient process for affordable, sustainable, and innovative funding strategies for water and wastewater infrastructure projects that

protect public health and safety. The GLO has been attending regular TWICC meetings to provide insight and updates on the upcoming CDBG-MIT funding stream and to keep members apprised of disaster recovery and mitigation programs.

2.10.8.3 *Local Coordination*

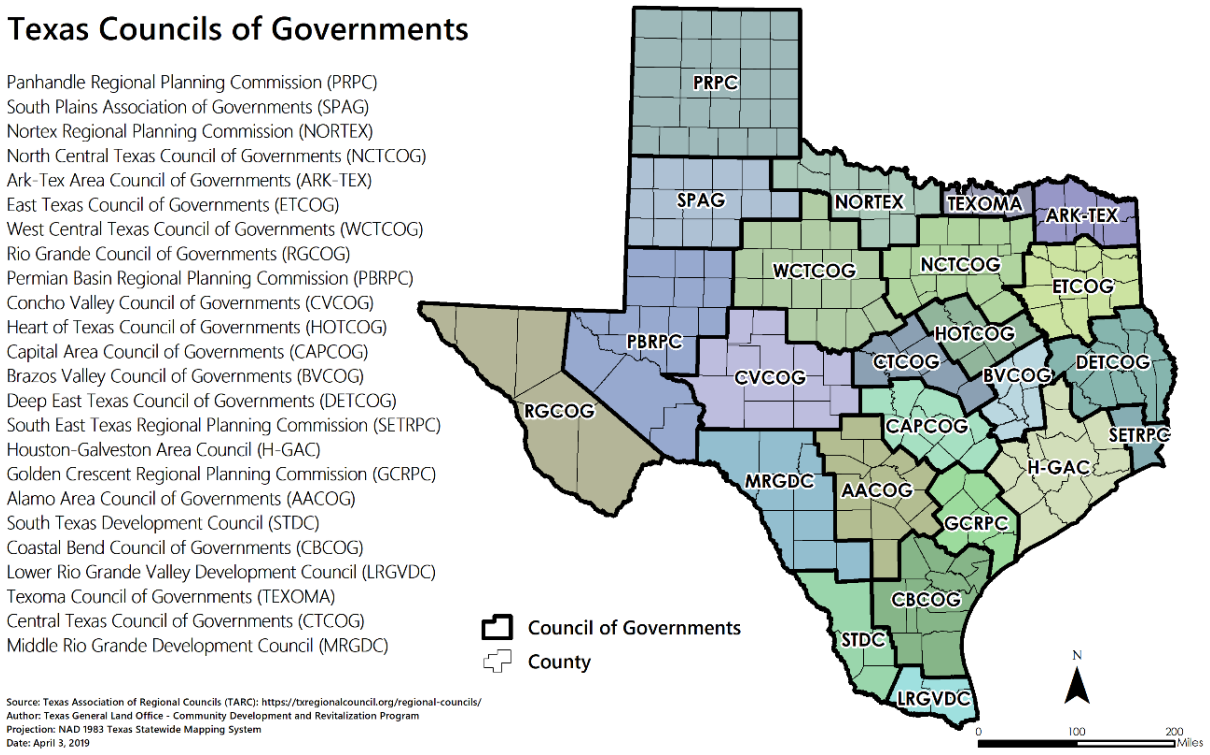
Councils of Governments

The state of Texas has a total of 24 councils of governments (COGs), regional councils or commissions that are comprised of a variety of all 254 counties, cities and special districts. COGs are political subdivisions of the state under Chapter 391 of the Texas Local Government Code. These councils were organized to guide unified development, service delivery and improve efficiency within regions. COGs are authorized to conduct planning; assist local governments in implementing plans; contract with local, state, and federal governments and other public and private agencies to provide community services; and assist local governments in solving governmental problems. COGs also serve as intermediaries among federal, state, and local governments while reviewing and commenting on applications for federal and state grants-in-aid and solid waste permits. While activities vary among regions, typically activities include planning for economic growth, water supply and water quality, air quality, transportation, emergency preparedness, implementing regional homeland security strategies, implementing criminal justice strategies and law enforcement training, maintaining and improving regional 911 systems, and the delivery of social services.

For example, each COG is a federally designated economic development district (EDD) under U.S. Economic Development Administration (EDA). The multijurisdictional entities help lead locally based, regionally driven economic development planning processes that leverage the involvement of the public, private and nonprofit sectors to establish a strategic blueprint for regional collaboration. This strategic blueprint is known as a Comprehensive Economic Development Strategy (CEDS) and is a plan for regional economic development.

In addition, COGs help the Office of the Governor prioritize and implement the Homeland Security Grant Program (HSGP), which plays an important role in the implementation of the National Preparedness System by supporting the building, sustainment and delivery of core capabilities essential to achieving the National Preparedness Goal of a secure and resilient nation. They also work to prioritize and administer the Texas Department of Agriculture's non-entitlement Community Development Block Grant funds.

Figure 2-78: Texas Councils of Governments



The Texas Association of Regional Councils (TARC) is the statewide association of COGs whose members are focused on enhancing quality of life through regional strategies, partnerships and solutions. TARC helps regional councils effectively assist local governments throughout Texas by sharing best practices, educating the public, and representing councils before local, state, and federal agencies and legislators. Since 1973, TARC has worked to strengthen the capabilities of the member councils while providing a forum for the exchange of ideas. TARC is governed by a policy board of local elected officials, including county judges, commissioners, mayors and city council members from the regions.

The GLO has maintained a close relationship with TARC and has conducted a variety of outreach efforts following the notice tied to the CDBG-MIT funds. Twenty-three (23) of the 24 COGs in Texas has a CDBG-MIT eligible county. Over the last year, the GLO has held stakeholder workshops and teleconference calls with almost all 23 COGs across the state and has presented at the quarterly TARC membership meetings to inform participants of the mitigation funding. This effort has been comprehensive to ensure mitigation alignment across the vast geography of Texas. The GLO will maintain this relationship with the COGs and TARC for the life of all CDBG-MIT programs described in this Action Plan.

Voluntary Organizations Active in Disaster/OneStar Foundation

The GLO has been working with the OneStar Foundation to engage the state's Voluntary Organizations Active in Disasters (VOADs) over the last several years. The OneStar Foundation, originally created as the Texas Center for Volunteer Action in 1976, is recognized state-wide as the voice of the volunteer, nonprofit, and faith-based neutral convener and a respected business partner to foundations, state agencies, and the business community tied to disaster response, recovery, and mitigation. In anticipation of the CDBG-MIT program, the GLO worked with the OneStar Foundation to ensure that the notification materials and relevant surveys were disseminated to all relevant VOADs and other organizations.

3 GENERAL REQUIREMENTS

3.1 Coordination of Mitigation Projects and Leverage

The GLO mitigation programs advance resilience to current and future hazards. Each mitigation program aligns with other planned federal, state, regional, or local capital improvements. Each proposed project application must describe how the proposed projects will: (a) Advance long-term resilience; (b) align with other planned capital improvements; and (c) promote community-level and regional (e.g., multiple local jurisdictions) planning for current and future disaster recovery efforts and additional mitigation investments.

The GLO will encourage subrecipients to leverage CDBG-MIT funds with funding provided by other federal, state, local, private, and nonprofit sources to utilize the limited CDBG-MIT funds to the fullest possible extent. The GLO will report on leverage funds in the Disaster Recovery Grant Reporting System (DRGR) system.

Funds may be used for matching requirements, share, or contribution for any other federal program when used to carry out an eligible CDBG-MIT activity. This includes programs or activities administered by the FEMA or USACE. By law, (codified in the HCD Act as a note to 105(a)), the amount of CDBG-MIT funds that may be contributed to a USACE project is $250,000 or less.

3.2 Displacement of Persons and/or Entities

To minimize the displacement of persons and/or entities that may be affected by the activities outlined in this Action Plan, the GLO will coordinate with other state agencies, local governments, and local non-profit organizations to ensure minimal displacement. However, should any proposed projects cause the displacement of people, the GLO will ensure the requirements set forth under the Uniform Relocation Assistance (URA) and Real Property Acquisition Policies Act, as amended, are met.

The relocation assistance requirements at section 104(d)(2)(A) of the Housing and Community Development Act (HCDA) and 24 CFR 42.350 are waived to the extent that they differ from the requirements of the URA and implementing regulations at 49 CFR part 24, as modified by the notice for activities related to disaster recovery. Without this waiver, disparities exist in relocation assistance associated with activities typically funded by HUD and FEMA (e.g., buyouts and relocation). Both FEMA and CDBG funds are subject to the requirements of the URA; however, CDBG funds are subject to Section 104(d), while FEMA funds are not. The URA provides that a displaced person is eligible to receive a rental assistance payment that covers a period of 42 months. By contrast, Section 104(d) allows a lower-income displaced person to choose between the URA rental assistance payment and a rental assistance payment calculated over a period of 60 months. This waiver of the Section 104(d) requirements ensures uniform and equitable treatment

by setting the URA and its implementing regulations as the sole standard for relocation assistance under the Federal Register notice.

The GLO will follow its Residential Anti-displacement and Relocation Assistance Plan (RARAP). The GLO will take the following steps and require subrecipients and developers to minimize the direct and indirect displacement of persons from their homes: Plan construction activities to allow tenants to remain in their units as long as possible, by rehabilitating empty units or buildings first; where feasible, give priority to rehabilitation of housing, as opposed to demolition, to avoid displacement; adopt policies to identify and mitigate displacement resulting from intensive public investment in neighborhoods; adopt tax assessment policies, such as deferred tax payment plans, to reduce impact of increasing property tax assessments on lower income owner-occupants or tenants in revitalizing areas; or target only those properties deemed essential to the need or success of the project.

3.3 Maximum Assistance

The maximum amount of assistance available to subrecipients under the GLO's mitigation program will be the maximum allocated to the HUD most impacted and distressed areas. For all housing and buyout activities, the GLO's housing guidelines establish housing assistance maximums. A waiver request must be submitted to the GLO if a subrecipient's housing assistance maximums exceed the GLO amounts. The GLO will evaluate each housing assistance waiver request for cost effectiveness. The GLO will consider exceptions for maximum awards when necessary to reasonably accommodate a person with disabilities.

3.4 Natural Infrastructure

The GLO will encourage projects that incorporate nature-based solutions and natural or green infrastructure in the selection and/or design of CDBG-MIT projects. The GLO will encourage subrecipients to consider natural infrastructure during the project selection process (e.g., alternatives and benefit-cost analysis). The Coastal Resiliency Program will select project from the Texas Coastal Master Resiliency Plan. The Texas Coastal Master Resiliency Plan calls for a balanced approach in managing coastal resources focused on community resiliency, ecological health, and economic growth by recommending projects ranging in type from nature-based ("green infrastructure") to structural-based ("gray infrastructure") to nonstructural-based projects, plans, policies, programs, and studies to employ a multiple lines of defense approach to coastal planning.

3.5 Protection of People and Property

3.5.1 Quality Construction Standards

The GLO will require both quality inspections and code compliance inspections on all projects. Site inspections will be required on all projects to ensure quality and compliance with building codes. The GLO will encourage and support subrecipients' efforts to update and strengthen local compliance codes to mitigate hazard risks due to sea level rise, high winds, storm surge, and flooding where applicable. In the project application, subrecipients will submit an explanation of both current and future planned codes to mitigate hazard risks. The GLO will provide technical guidance on hazard mitigation code examples.

All rehabilitation (meets the definition of substantial improvement), reconstruction, or new construction must meet an industry-recognized standard that has achieved certification under at least one of the following programs: (1) ENERGY STAR (Certified Homes or Multifamily High-Rise), (2) Enterprise Green Communities, (3) LEED (New Construction, Homes, Midrise, Existing Buildings Operations and Maintenance, or Neighborhood Development), or (4) ICC– 700 National Green Building Standard. For rehabilitation of non-substantially damaged residential buildings, the GLO will follow the guidelines to the extent applicable as specified in the HUD CPD Green Building Retrofit Checklist. For infrastructure projects, the GLO will encourage, to the extent practicable, implementation of green building practices.

3.5.2 Housing Contractors Standards

The GLO will establish standards in the request for qualifications for housing contractors and will encourage subrecipients to do the same. The standards will include, but are not limited to, information on the company's (1) organizational structure and capabilities, (2) ability to perform, (3) recent construction projects completed or underway over the past 5 years, (4) performance and payment bond capacity, (5) financial statements for the past 2 years, (6) evidence of insurance coverage, and (7) business registrations, certifications, and licenses.

To ensure full and open competition, subrecipients are required to follow federal procurement and contract requirements outlined in 2 CFR 200.318 – 200.326. The GLO will monitor subrecipient procurement. The GLO will require a warranty period post-construction for housing; all work performed by the contractor will be guaranteed for a period of 1 year.

3.6 Operation and Maintenance Plans

Each proposed project must identify in the project application the plan for the long-term operation and maintenance of infrastructure and public facility projects funded with CDBG-MIT funds. The proposed project application must describe how it will fund long-term operation and maintenance for CDBG-MIT projects.

3.7 Cost Verification

For infrastructure projects the GLO will rely on licensed engineers responsible for project budget justification, construction code requirements, and CDBG-MIT project funding maximums. The GLO will encourage subrecipients to consider the costs and benefits of the project when selecting CDBG-MIT eligible projects. The GLO may use an independent, qualified third-party architect, construction manager, or other professional (e.g., a cost estimator) to verify the planned project costs and cost changes to the contract (e.g., change orders) during implementation are reasonable. The proposed projects undergo application review which includes a cost verification. Each identified covered projects will be required to conduct a benefit cost analysis (BCA).

For housing activities, the GLO housing guidelines outlines applicable housing maximum spending caps to service as cost control measures.

3.8 Elevation Standards

The GLO will apply the following elevation standards to new construction, repair of substantial damage, or substantial improvement of structures located in an area delineated as a flood hazard area or equivalent in FEMA's data source identified in 24 CFR 55.2(b)(1). All structures, as defined under 44 CFR 59.1, designed principally for residential use and located in the 100-year (or 1 percent annual chance) floodplain that receive assistance for new construction, repair of substantial damage, or substantial improvement, as defined under 24 CFR 55.2(b) (10), must be elevated with the lowest floor, including the basement, at least 2 feet above the base flood elevation. Mixed-use structures with no dwelling units and no residents below the base flood elevation must be elevated or floodproofed in accordance with FEMA floodproofing standards under 44 CFR 60.3(c)(3)(ii) or successor standard, at least 2 feet above the base flood elevation.

Applicable state, local, and tribal codes and standards for floodplain management that exceed these requirements, including elevation, setbacks, and cumulative substantial damage requirements, will be followed.

The GLO has established elevation costs caps at $60,000 for elevation of single family homes in coastal counties, and $35,000 for non-coastal counties. These elevation costs caps were established considering elevation costs associated with past GLO CDBG-DR housing rehabilitation/reconstruction programs. Elevation costs higher than these established caps will require a waiver request to the GLO. Elevation requirements are taken into consideration when

determining whether to rehabilitate or reconstruct a home. Generally, a home will be reconstructed when home repair costs are greater than $65,000, an exception to this may include a home that has been determined eligible on the National Register of Historic Places. The GLO may re-evaluate its elevation costs caps during implementation based on average costs associated with elevating single family homes and on a case by case basis as needed.

Nonresidential structures must be elevated to the standards described in this paragraph or floodproofed, in accordance with FEMA floodproofing standards at 44 CFR 60.3(c)(3)(ii) or successor standard, up to at least two feet above the 100-year (or 1 percent annual chance) floodplain. All Critical Actions, as defined at 24 CFR 55.2(b)(3), within the 500-year (or 0.2 percent annual chance) floodplain must be elevated or floodproofed (in accordance with the FEMA standards) to the higher of the 500-year floodplain elevation or 3 feet above the 100-year floodplain elevation. If the 500-year floodplain or elevation is unavailable, and the Critical Action is in the 100-year floodplain, then the structure must be elevated or floodproofed at least 3 feet above the 100-year floodplain elevation. Critical Actions are defined as an ‘‘activity for which even a slight chance of flooding would be too great, because such flooding might result in loss of life, injury to persons or damage to property.’’ For example, Critical Actions include hospitals, nursing homes, police stations, fire stations and principal utility lines.

The GLO has not established elevation cost caps for multifamily rental developments and infrastructure (public facilities, public improvements, and/or nonresidential structures). To evaluate reasonable elevation costs, the GLO will rely on licensed engineers responsible for project budget justification, construction code requirements, and CDBG-MIT project funding maximums. The GLO will encourage subrecipients to consider the costs and benefits of the project when selecting CDBG-MIT eligible projects.

3.9 Appeals Processes

The GLO responds to complaints and appeals in a timely and professional manner to maintain a quality level of operations. The GLO’s appeals processes apply to appeals received from homeowners, contractors, cities, counties, housing authorities, and other entities. The GLO will respond to homeowners by coordinating with the applicable subrecipient and/or housing contractor to resolve issues.

A record of each complaint or appeal that the GLO receives is kept in an information file. When a complaint or appeal is received, the GLO will respond to the complainant or appellant within 15 business days where practicable. For expediency, the GLO will utilize telephone communication as the primary method of contact; email and postmarked letters will be used as necessary to document conversations and transmit documentation.

Information about the complainant’s rights and how to file a complaint shall be printed on all program applications, guidelines, the GLO public website, and subrecipients’ websites in all local

languages, as appropriate and reasonable. Procedures for appealing a GLO decision on a complaint shall be provided to complainants in writing as part of the complaint response.

3.10 Dam and Levee Requirements

As stated in the Federal Register notice, 84 FR 45838 (August 30, 2019), CDBG-MIT funds are prohibited from being used to enlarge a dam or levee beyond the original footprint of the structure that existed prior to the disaster event. The GLO will ensure that if subrecipients use CDBG-MIT funds for levees and dams, the subrecipients will (1) register and maintain entries regarding such structures with the U.S. Army Corps of Engineers (USACE) National Levee Database or National Inventory of Dams, (2) ensure that the structure is admitted in the USACE PL 84–99 Program (Levee Rehabilitation and Improvement Program), and (3) ensure the structure is accredited under the FEMA NFIP. The GLO will upload into the DRGR system the exact location of the structure and the area served and protected by the structure and maintain file documentation demonstrating that the grantee has conducted a risk assessment prior to funding the flood control structure and that the investment includes risk reduction measures**.**

3.11 Program Income

Any program income earned as a result of activities funded under this grant will be subject to alternate requirements of 24 CFR 570.489(e), which defines program income. Program income generated under individual contracts with the subrecipients will be returned to the GLO. At the GLO's discretion, program income could be allowed to remain with a community to continue mitigation efforts.

3.12 Monitoring Standards

The GLO provides program-wide oversight and monitoring activities for all applicable CDBG and related federal requirements in its administration of the CDBG-MIT Program. The GLO will provide technical assistance to recipients from the application stage through the completion of the projects to ensure that funds are appropriately used for the CDBG-MIT activities, as well as meeting one of the national objectives. The state shall coordinate with the Indian tribe with jurisdiction over the tribal area when providing CDBG-MIT assistance to beneficiaries in tribal areas.

The GLO will monitor all contract expenditures for quality assurance and to prevent, detect, and eliminate fraud, waste, and abuse as mandated by Executive Order (EO) RP 36, signed July 12, 2004, by the Governor of Texas. The GLO will particularly emphasize mitigation of fraud, abuse, and mismanagement related to accounting, procurement, and accountability which may also be investigated by the State Auditor's Office (SAO). In addition, the GLO and the grantees are subject to Uniform Guidance Standards of 2 CFR 200, which encompasses the review of compliance with program requirements and the proper expenditure of funds by an independent Certified Public

Accountant (CPA) or by the SAO. Reports from the SAO's office will be sent to the Office of the Governor, the Legislative Committee, and the GLO.

The GLO has an internal audit staff that performs independent internal audits of programs and can perform such audits on these programs and grantees. The GLO also has an independent auditing staff that reports directly to the Commissioner of the GLO and the Chief Clerk. The GLO will utilize a monitoring plan and risk assessment to specifically ensure that the recovery allocation is carried out in accordance with state and federal laws, rules, and regulations, as well as the requirements set forth in the Federal Register notices. The monitoring plan will also include duplication of benefits review to ensure compliance with the Stafford Act. GLO shall attend and require subrecipients to attend fraud-related training provided by HUD OIG to assist in the proper management of CDBG-MIT grant funds. The state shall establish and maintain such records as maybe necessary to facilitate review and audit by HUD of the state's administration of CDBG-MIT funds, under 24 CFR 570.493. For fair housing and equal opportunity (FHEO) purposes, as applicable, GLO records shall include data on the racial, ethnic, and gender characteristics of persons who are applicants for, participants in, or beneficiaries of the program.

3.13 Broadband Infrastructure

As required by the Federal Register notice, 84 FR 45838 (August 30, 2019), any new construction or substantial rehabilitation, as defined by 24 CFR 5.100, of a building with more than four rental units will include installation of broadband infrastructure, as defined in 24 CFR 5.100, except where the grantee documents that: (1) the location of the new construction or substantial rehabilitation makes installation of broadband infrastructure infeasible; (2) the cost of installing broadband infrastructure would result in a fundamental alteration in the nature of its program or activity or in an undue financial burden; or (3) the structure of the housing to be substantially rehabilitated makes installation of broadband infrastructure infeasible.

3.14 Section 3 Compliance

For applicable funded programs, the GLO and its subrecipients will ensure compliance with all pertinent Section 3 regulations to the greatest extent possible, including providing training, employment, contracting, and other economic opportunities to low-income and very low-income persons, especially recipients of government assistance for housing and to businesses that provide economic opportunities to low- and very low-income persons. Additional details can be found in Section 3 policy and procedures.

4 STATE ADMINISTERED MITIGATION PROGRAM

4.1 Action Plan

As required by HUD's Federal Register notice, 84 FR 45838 (August 30, 2019), this Action Plan describes the method of distribution (MOD) of CDBG-MIT funds and the descriptions of specific programs or activities that the GLO will carry out directly. The Mitigation Needs Assessment (the Assessment) for this Action Plan was conducted to inform and direct the development and prioritization of all mitigation activities outlined in this Action Plan. In addition, the GLO conducted an extensive stakeholder outreach effort that involved consulting with affected citizens, local governments, state and regional agencies, and public housing authorities to assess the mitigation needs of individual communities.

This Action Plan outlines the following:

i. The eligible affected areas and subrecipients;
ii. Criteria for eligibility;
iii. The methodology used to distribute funds to those subrecipients;
iv. Activities for which funding may be used; and
v. Program requirements, including non-duplication of benefits.

The Action Plan also defines how all funded activities address necessary expenses related to the creation or restoration of resilient infrastructure, the reconstruction of resilient housing, and general efforts to make communities more resilient.

4.2 Connection to Mitigation Needs Assessment

As required by HUD's Federal Register notice, 84 FR 45838 (August 30, 2019), the GLO will allocate at least 50 percent of the funds to address mitigation needs within HUD-identified "most impacted and distressed" areas:

Table 4-1: CDBG-MIT Most Impacted and Distressed Counties (HUD MID)

HUD MID Counties		
2015 Floods	2016 Floods	Hurricane Harvey
Harris County	Brazoria County	Aransas County
Hays County	Fort Bend County	Brazoria County
Hidalgo County	Harris County	Chambers County
Travis County	Montgomery County	Fayette County
	Newton County	Fort Bend County
		Galveston County
		Hardin County
		Harris County
		Jasper County
		Jefferson County
		Liberty County
		Montgomery County
		Newton County
		Nueces County
		Orange County
		Refugio County
		San Jacinto County
		San Patricio County
		Victoria County
		Wharton County
HUD MID ZIP Codes		
2015 Floods	2016 Floods	Hurricane Harvey
		75979 (Tyler County)
		77320 (Walker County)
		77335/77351 (Polk County)
		77414/77482 (Matagorda County)
		77423/77493 (Waller County)

HUD MID Counties		
2015 Floods	2016 Floods	Hurricane Harvey
		77979 (Calhoun County)
		78934 (Colorado County)

Up to 50 percent of the allocation may be used to address mitigation needs in those counties that received a 2015 Floods (DR-4223 and DR-4245), 2016 Floods (DR-4266, DR-4269 and DR-4272), or Hurricane Harvey (DR-4332) Presidential disaster declaration but were not classified as HUD MID; these counties are classified as State MID (grantee-identified MID areas).

Additional areas within counties not explicitly classified as HUD MID or State MID may also serve as locations of CDBG-MIT funded activities if it can be demonstrated that the expenditure of CDBG-MIT funds in that area will measurably mitigate risks in either a HUD MID or State MID area (e.g., upstream water retention projects to reduce downstream flooding in an eligible MID area).

This Action Plan considers and addresses critical mitigation needs over a large geography while maintaining as much local control as possible through several programs aimed at creating more resilient communities through improved infrastructure, housing, building and land use policies and practices, and hazard mitigation planning. Through the Assessment, the GLO identified the need for and developed the following programs:

i. Local and Regional Mitigation:
ii. State Mitigation Competitions;
iii. Regional Mitigation Program (COG MODs);
iv. Hazard Mitigation Grant Program (HMGP): Supplemental; and
v. Coastal Resiliency Program.
vi. Housing:
vii. Housing Oversubscription Supplemental; and
viii. Resilient Home Program.
ix. Planning:
x. Hazard Mitigation Plans;
xi. Resilient Communities Program; and
xii. Regional and State Planning.

These programs were developed to meet CDBG-MIT, federal, and state requirements and regulations, as well as to fund mitigation activities that protect against loss of life and property as efficiently and expeditiously as possible. Public service activities including housing and legal counseling, public outreach, and education may need to be utilized to complement several of these programs.

While the majority of funds are allocated to various local and regional mitigation activities—which will encompass any non-planning and non-housing projects, assistance to homeowners through the reconstruction of homes will comprise more than thirteen (13) percent of the total allocation. Both the Housing Oversubscription Supplemental Program and the Resilient Home Program will allow the GLO to assist homeowners impacted by Hurricane Harvey to inhabit new homes that are proven to match or exceed HUD's requirements, creating more resilient communities that recover more quickly from the next disaster event.

As noted above, the GLO recognizes that a comprehensive response to the threats and impacts of natural hazards involves the implementation of well-considered local and regional mitigation activities in the form of infrastructure projects, buyouts of homes in the floodplain, and other interventions that are vital for the protection, resiliency, and viability of communities. Accordingly, sixty-eight (68) percent of the funds will address hazard mitigation needs related to local and regional mitigation activities.

Planning encompasses a wide array of activities that ensure that policies and practices are developed and implemented to reduce impacts from future natural hazards. These activities will be focused on regional approaches to planning in addition to specific local solutions that promote sustainable mitigation planning and policy informed by an evaluation of short- and long-term hazard risk. These activities will involve: (1) the creation of FEMA-approved Local Hazard Mitigation Action Plans; (2) local land use, zoning, and comprehensive plans; (3) regional planning studies; and (4) the adoption of building codes and floodplain ordinances that reduce the risk of future hazard impacts.

The GLO has allocated five (5) percent for administrative costs, including contract administration, compliance monitoring, and the provision of technical assistance to applicants and subrecipients. Based on experience, it is expected that some subrecipients will need direct support implementing their programs; therefore, the GLO is allocating three (3) percent for project delivery. Providing direct support to subrecipients will help ensure that programs are implemented as efficiently and expeditiously as possible.

At least 50 percent of all program funds will benefit LMI persons.

As required, a Mitigation Needs Assessment (the Assessment) was completed to identify long-term risks and investment priorities for CDBG-MIT funding allocated as a result of the 2015 Floods, 2016 Floods, and Hurricane Harvey. The Assessment takes into account a comprehensive

set of data sources that cover multiple geographies and sectors. The Assessment includes specific details about hazard risks within the eligible most impacted and distressed communities, and includes details for housing, infrastructure, and land use. The Assessment may be amended as additional information becomes available or existing information is updated.

4.3 Program Budget

Figure 4-1: Program Budget

Programs	HUD Most Impacted and Distressed	State Most Impacted and Distressed	Total Allocation	% of Total Allocation	LMI Amount
2015 Floods State Mitigation Competition	$ 23,048,475	$ 23,048,475	$ 46,096,950	1.07%	$ 23,048,475
2016 Floods State Mitigation Competition	$ 73,840,380	$ 73,840,380	$ 147,680,760	3.44%	$ 73,840,380
Hurricane Harvey State Mitigation Competition	$ 1,072,388,360	$ 1,072,388,360	$ 2,144,776,720	49.91%	$ 1,072,388,360
Regional Mitigation Program	$ 400,000,000	$ 100,000,000	$ 500,000,000	11.64%	$ 250,000,000
AACOG	$ -	$ 12,805,000	$ 12,805,000	2.56%	$ 6,402,500
BVCOG	$ -	$ 10,729,000	$ 10,729,000	2.15%	$ 5,364,500
CAPCOG	$ 10,765,000	$ 11,623,000	$ 22,388,000	4.48%	$ 11,194,000
CBCOG	$ 64,057,000	$ 12,870,000	$ 76,927,000	15.39%	$ 38,463,500
CTCOG	$ -	$ 2,900,000	$ 2,900,000	0.58%	$ 1,450,000
DETCOG	$ 54,829,000	$ 14,384,000	$ 69,213,000	13.84%	$ 34,606,500
GCRPC	$ 18,273,000	$ 16,139,000	$ 34,412,000	6.88%	$ 17,206,000
HGAC	$ 190,860,000	$ 18,550,000	$ 209,410,000	41.88%	$ 104,705,000
SETRPC	$ 61,216,000	$ -	$ 61,216,000	12.24%	$ 30,608,000
HMGP: Supplemental	$ 85,000,000	$ 85,000,000	$ 170,000,000	3.96%	$ 85,000,000
Coastal Resiliency Program	$ 100,000,000	$ -	$ 100,000,000	2.33%	$ 50,000,000
Housing Oversubscription Supplemental	$ 320,000,000	$ 80,000,000	$ 400,000,000	9.31%	$ 280,000,000
Resilient Home Program	$ 80,000,000	$ 20,000,000	$ 100,000,000	2.33%	$ 70,000,000
State Project Delivery	$ 64,457,835	$ 64,457,835	$ 128,915,670	3.00%	$ 64,457,835
Hazard Mitigation Plans	$ 15,000,000	$ 15,000,000	$ 30,000,000	0.70%	N/A
Resilient Communities Program	$ 50,000,000	$ 50,000,000	$ 100,000,000	2.33%	N/A
Regional and State Planning	$ 107,429,725	$ 107,429,725	$ 214,859,450	5.00%	N/A
State Administration	$ 107,429,725	$ 107,429,725	$ 214,859,450	5.00%	N/A
Total	$ 2,498,594,500	$ 1,798,594,500	$ 4,297,189,000	100%	$ 1,968,735,050

4.4 GLO Use of Funds

4.4.1 2015 Floods State Mitigation Competition

The GLO will conduct a mitigation competition to address risks in the 2015 Floods HUD MID and State MID areas. Eligible applicants will include units of local government (cities and counties), Indian Tribes, and councils of governments. Entities may coordinate activities and submit a joint project that crosses jurisdictional boundaries. The city of Houston and the city of San Marcos are ineligible to apply for the 2015 Floods State Mitigation Competition. The city of Houston and the city of San Marcos each received a direct HUD CDBG-MIT allocation related to the 2015 flooding events. Each applicant may submit a total of two applications, whether applying as the lone applicant or jointly with another jurisdiction(s). Each application must consist of one project. Depending on demand, no applicant will be awarded for their second application until all successful eligible applicants have been awarded funding at least once. If an applicant is eligible for multiple competitions, the same project(s) cannot be submitted in each competition. If a project is a phase of a larger project, the phase of the project submitted must be viable as a stand-alone project. Applicants are encouraged to incorporate nature-based solutions, including natural or green infrastructure, into their proposed projects.

The GLO reserves the option to delay award(s) to ensure that at least fifty (50) percent of funds benefit LMI persons and at least fifty (50) percent of funds address identified risks in the 2015 Floods HUD MID areas (counties).

4.4.1.1 *Connection to Identified Risk:*

As outlined in Mitigation Needs Assessment, severe coastal/riverine flooding, storms, and tornadoes are among the top risks to which Texas has the greatest exposure. Each proposed project must mitigate against one of these identified risks.

4.4.1.2 *Allocation Amount:* $46,096,950

i. At least fifty (50) percent of funds must address identified risks in the 2015 Floods HUD MID areas (counties); and

ii. Up to fifty (50) percent of funds may address identified risks in the 2015 Floods State MID counties.

4.4.1.3 *Award Amount:*

i. Maximum Amount: $10,000,000

ii. Minimum Amount: $3,000,000

4.4.1.4 *Eligible Applicants:* Units of local government (cities and counties), Indian Tribes, and councils of governments.

4.4.1.5 *Eligible Activities: All activities allowed under CDBG-MIT; HCDA Section 105(a) (1-5), 105(a) (7-9), and 105(a)(11), including but not limited to:*

i. Flood control and drainage improvements, including the construction or rehabilitation of stormwater management system;

ii. Infrastructure improvements (such as water and sewer facilities, streets, provision of generators, removal of debris, bridges, etc.);

iii. Natural or green infrastructure;

iv. Communications infrastructure;

v. Public facilities;

vi. Buyouts or Acquisition with or without relocation assistance, down payment assistance, housing incentives, and demolition;

vii. Activities designed to relocate families outside of floodplains;

viii. Public service within the 15 percent cap (e.g., housing counseling, legal counseling, job training, mental health, and general health services);

ix. FEMA Hazard Mitigation Grant Program (HMGP) cost share for CDBG-MIT eligible project;

x. Economic development (assistance to businesses for the installation of disaster mitigation improvements and technologies; financing to support the development of technologies, systems and other measures to mitigate future disaster impacts; ‘‘hardening’’ of commercial areas and facilities; and financing critical infrastructure sectors to allow continued commercial operations during and after disasters); and

xi. Nonresidential structures must be elevated to the standards described in this paragraph or floodproofed, in accordance with FEMA floodproofing standards at 44 CFR 60.3(c)(3)(ii) or successor standard, up to at least two feet above the 100-year (or 1 percent annual chance) floodplain. All Critical Actions, as defined at 24 CFR 55.2(b)(3), within the 500-year (or 0.2 percent annual chance) floodplain must be elevated or floodproofed (in accordance with the FEMA standards) to the higher of the 500-year floodplain elevation or 3 feet above the 100-year floodplain elevation. If the 500-year floodplain or elevation is unavailable, and the Critical Action is in the 100-year floodplain, then the structure must be elevated or floodproofed at least 3 feet above the 100-year floodplain elevation. Critical Actions are defined as an ‘‘activity for which even a slight chance of flooding would be too great, because such flooding might result in loss of life, injury to

persons or damage to property.'' For example, Critical Actions include hospitals, nursing homes, police stations, fire stations and principal utility lines.

4.4.1.6 *Ineligible Activities*

i. Emergency response services. Emergency response services shall mean those services that are carried out in the immediate response to a disaster or other emergency in order to limit the loss of life and damage to assets by state and local governmental and nongovernmental emergency public safety, fire, law enforcement, emergency response, emergency medical (including hospital emergency facilities), and related personnel, agencies, and authorities.

ii. CDBG-MIT funds may not be used to enlarge a dam or levee beyond the original footprint of the structure that existed prior to the disaster event. CDBG-MIT funds for levees and dams are required to:

iii. Register and maintain entries regarding such structures with the USACE National Levee Database or National Inventory of Dams;

iv. Ensure that the structure is admitted in the USACE PL 84–99 Rehabilitation Program (Rehabilitation Assistance for Non-Federal Flood Control Projects);

v. Ensure the structure is accredited under the FEMA NFIP; and

vi. Maintain file documentation demonstrating a risk assessment prior to funding the flood control structure and documentation that the investment includes risk reduction measures.

vii. Funds may not be used to assist a privately owned utility for any purpose. A private utility, also referred to as an investor-owned utility, is owned by private investors and is for-profit as opposed to being owned by a public trust or agency (e.g., a coop or municipally owned utility);

viii. Buildings and facilities used for the general conduct of government (e.g., city halls, courthouses, and emergency operation centers);

ix. By law, (codified in the HCD Act as a note to 105(a)), the amount of CDBG-MIT funds that may be contributed to a USACE project is $250,000 or less;

x. Section 582 of the National Flood Insurance Reform Act of 1994, as amended, (42 U.S.C. 5154a) prohibits flood disaster assistance in certain circumstances. In general, it provides that no federal disaster relief assistance made available in a flood disaster area may be used to make a payment (including any loan assistance payment) to a person for ''repair, replacement, or restoration'' for damage to any personal, residential, or commercial property if that person at any time has received federal flood disaster assistance that was conditioned on the person first having obtained flood insurance under applicable federal law and the person has

subsequently failed to obtain and maintain flood insurance as required under applicable federal law on such property. No disaster assistance may be provided for the repair, replacement, or restoration of a property to a person who has failed to meet this requirement;

xi. If the property is purchased through the use of eminent domain, the ultimate use of that property may not benefit a particular private party and must be for a public use; eminent domain can be used for public use, but public use shall not be construed to include economic development that primarily benefits private entities; and

xii. Incentive payments to households that move to disaster-impacted floodplains.

4.4.1.7 *Project Eligibility:*

i. Meets the definition of mitigation activities;

ii. Addresses identified current and future risks; mitigation related to severe coastal and riverine flooding, storms, tornadoes;

iii. Meets the definition of a CDBG-eligible activity under title I of HCDA or otherwise pursuant to a waiver or alternative requirement;

iv. Meets a CDBG national objective;

v. Includes a plan for the long-term funding and management of the operations and maintenance of the project; and

vi. Cost verification controls must be in place to assure that construction costs are reasonable and consistent with market costs at the time and place of construction.

4.4.1.8 *Program Guidelines for Residential Buyout or Acquisition Activities (Only):*

Each subrecipient will develop guidelines in accordance with CDBG-MIT requirements and regulations to set maximum assistance amounts, target area locations, Disaster Risk Reduction Area, and additional eligibility requirements. Guidelines must be posted for public comment before use. The GLO must approve all guidelines. Subrecipients are required to develop and follow a RARAP. Subrecipients may adopt program guidelines used for the Local Buyout and Acquisition Program administered under the State of Texas Plan for Disaster Recovery: Hurricane Harvey for $5.676 billion in CDBG-DR funding. With respect to the buyout of properties, an "intended, planned, or designated project area," as referenced at 49 CFR24.l0l(b)(l)(ii), shall be an area for which a clearly defined end use has been determined at the time that the property is acquired, in which all or substantially all of the properties within the area must be acquired within an established time period as determined by the grantee or acquiring entity for the project to move forward.

To conduct a buyout or an acquisition, the subrecipient must establish criteria in its policies and procedures to designate the area subject to the buyout, pursuant to the following requirements:

In a Disaster Risk Reduction Area:

i. The hazard must have been caused or exacerbated by the Presidentially declared disaster for which the grantee received its CDBG-MIT allocation;

ii. The hazard must be a predictable environmental threat to the safety and well-being of program beneficiaries, as evidenced by the best available data (e.g., FEMA RL Data) and science;

iii. The Disaster Risk Reduction Area must be clearly delineated so that HUD and the public may easily determine which properties are located within the designated area. The distinction between buyouts and other types of acquisitions is important, because subrecipient may only redevelop an acquired property if the property is not acquired through a buyout program (i.e., the purpose of acquisition was something other than risk reduction). When properties are not acquired through a buyout program, the purchase price must be consistent with applicable uniform cost principles (and the pre-disaster FMV may not be used); and

iv. In carrying out acquisition activities, subrecipient must ensure they are in compliance with their long-term redevelopment and FEMA Approved Hazard Mitigation plans.

4.4.1.9 *Selection Criteria:*

Table 4-2: 2015 Floods State Mitigation Competition Scoring Criteria

Criteria	Maximum Points
County Composite Disaster Index	10 Points Possible
Top 10%	*10 Points*
Top 25%	*8 Points*
Top 75%	*5 Points*
Bottom 25%	*2 Points*
Bottom 10%	*0 Points*
Social Vulnerability Index	10 Points Possible
High	*10 Points*
Medium High	*8 Points*
Medium	*5 Points*
Medium Low	*2 Points*

Criteria	Maximum Points
Low	*0 Points*
Per Capita Market Value	10 Points Possible
Less than $95,000.00	*10 Points*
$95,000.01 - $140,000.00	*8 Points*
$140,000.01 - $200,000.00	*5 Points*
$200,000.01 - $425,000.00	*2 Points*
$425,000.01 or greater	*0 Points*
LMI National Objective	20 Points Possible
Project meets LMI national objective	20 Points
Project does not meet LMI national objective	0 Points
Project Identified in Local Adopted Plan	5 Points Possible
Project identified in local adopted plan	5 Points
Project not identified	0 Points
Management Capacity	15 Points Possible
No CDBG contracts with GLO (management capacity assessment)	Up to 15 Points
Performance on GLO CDBG contract(s), programs and/or projects	Up to 15 Points
Project Impact	25 Points Possible
Total project application amount per total project beneficiaries	15 Points
Percentage of total project beneficiaries out of the total population within a jurisdiction(s)	10 Points
Leverage	5 Points Possible
Non-CDBG Leverage (a minimum value of 1% of the CDBG-MIT funds requested)	5 Points
Tie-breaker: Higher Poverty Rate	
*More details on scoring criteria will be available in the application guidelines.	
**Applications that do not score a minimum of 65 points will only be considered after all applications scoring greater than this amount have been funded.	

4.4.1.10 *National Objectives:* UNM, LMI, low/mod buyout (LMB), and low/mod incentive; at least fifty (50) percent of funds must benefit LMI persons.

4.4.1.11 *AFFH Review:*

All proposed projects will undergo AFFH review by the GLO before approval. Such review will include assessments of (1) a proposed project's area demography, (2) socioeconomic characteristics, (3) housing configuration and needs, (4) educational, transportation, and health care opportunities, (5) environmental hazards or concerns, and (6) all other factors material to the AFFH determination. Applications should show that projects are likely to lessen area racial, ethnic, and low-income concentrations, and/or promote affordable housing in low-poverty, nonminority areas in response to natural hazard-related impacts.

4.4.1.12 *Timeline:* The proposed program start date is 1 month after HUD's approval of this Action Plan. The proposed end date is 4 years from the start date of the program.

4.4.2 2016 Floods State Mitigation Competition

The GLO will conduct a mitigation competition to address risks in the 2016 Floods HUD MID and State MID areas. Eligible applicants will include units of local government (cities and counties), Indian Tribes, and councils of governments. Entities may coordinate activities and submit a joint project that crosses jurisdictional boundaries. Each applicant may submit a total of 2 applications, whether applying as the lone applicant or jointly with another jurisdiction(s). Each application must consist of one project. Depending on demand, no applicant will be awarded for their second application until all successful eligible applicants have been awarded funding at least once. If an applicant is eligible for multiple competitions, the same project(s) cannot be submitted in each competition. If a project is a phase of a larger project, the phase of the project submitted must be viable as a stand-alone project. Applicants are encouraged to incorporate nature-based solutions, including natural or green infrastructure, into their proposed projects.

The GLO reserves the option to delay award(s) to ensure that at least fifty (50) percent of funds benefit LMI persons and at least fifty (50) percent of funds address identified risks in the 2016 Floods HUD MID areas (counties).

4.4.2.1 *Connection to Identified Risk:*

As outlined in Mitigation Needs Assessment, severe coastal/riverine flooding, storms, and tornadoes are among the top risks to which Texas has the greatest exposure. Each proposed project must mitigate against one of these identified risks.

4.4.2.2 *Allocation Amount:* $147,680,760

i. At least fifty (50) percent of funds must address identified risks in the 2016 Floods HUD MID areas (counties); and

ii. Up to fifty (50) percent of funds may address identified risks in the 2016 Floods State MID counties.

4.4.2.3 *Award Amount:*

i. Maximum Amount: $10,000,000

ii. Minimum Amount: $3,000,000

4.4.2.4 *Eligible Applicants:* Units of local government (cities and counties), Indian Tribes and councils of governments

4.4.2.5 *Eligible Activities: All activities allowed under CDBG-MIT; HCDA Section 105(a) (1-5), 105(a) (7-9), and 105(a)(11), including but not limited to:*

i. Flood control and drainage improvements, including the construction or rehabilitation of stormwater management system;

ii. Infrastructure improvements (such as water and sewer facilities, streets, provision of generators, removal of debris, bridges, etc.);

iii. Natural or green infrastructure;

iv. Communications infrastructure;

v. Public facilities;

vi. Buyouts or Acquisition with or without relocation assistance, down payment assistance, housing incentives, and demolition;

vii. Activities designed to relocate families outside of floodplains;

viii. Public service within the 15 percent cap (e.g., housing counseling, legal counseling, job training, mental health, and general health services);

ix. FEMA Hazard Mitigation Grant Program (HMGP) cost share for CDBG-MIT eligible project;

x. Economic development (assistance to businesses for the installation of disaster mitigation improvements and technologies; financing to support the development of technologies, systems and other measures to mitigate future disaster impacts; ‘‘hardening’’ of commercial areas and facilities; and financing critical infrastructure sectors to allow continued commercial operations during and after disasters); and

xi. Nonresidential structures must be elevated to the standards described in this paragraph or floodproofed, in accordance with FEMA floodproofing standards at 44 CFR 60.3(c)(3)(ii) or successor standard, up to at least two feet above the 100-year (or 1 percent annual chance) floodplain. All Critical Actions, as defined at 24 CFR 55.2(b)(3), within the 500-year (or 0.2 percent annual chance) floodplain must be elevated or floodproofed (in accordance with the FEMA standards) to the higher of the 500-year floodplain elevation or 3 feet above the 100-year floodplain elevation. If the 500-year floodplain or elevation is unavailable, and the Critical Action is in the 100-year floodplain, then the structure must be elevated or floodproofed at least 3 feet above the 100-year floodplain elevation. Critical Actions are defined as an ‘‘activity for which even a slight chance of flooding would be too great, because such flooding might result in loss of life, injury to

persons or damage to property.'' For example, Critical Actions include hospitals, nursing homes, police stations, fire stations and principal utility lines.

4.4.2.6 *Ineligible Activities*

i. Emergency response services. Emergency response services shall mean those services that are carried out in the immediate response to a disaster or other emergency in order to limit the loss of life and damage to assets by state and local governmental and nongovernmental emergency public safety, fire, law enforcement, emergency response, emergency medical (including hospital emergency facilities), and related personnel, agencies, and authorities;

ii. CDBG-MIT funds may not be used to enlarge a dam or levee beyond the original footprint of the structure that existed prior to the disaster event. CDBG-MIT funds for levees and dams are required to:

iii. Register and maintain entries regarding such structures with the USACE National Levee Database or National Inventory of Dams;

iv. Ensure that the structure is admitted in the USACE PL 84–99 Rehabilitation Program (Rehabilitation Assistance for Non-Federal Flood Control Projects);

v. Ensure the structure is accredited under the FEMA NFIP; and

vi. Maintain file documentation demonstrating a risk assessment prior to funding the flood control structure and documentation that the investment includes risk reduction measures.

vii. Funds may not be used to assist a privately owned utility for any purpose. A private utility, also referred to as an investor-owned utility, is owned by private investors and is for-profit as opposed to being owned by a public trust or agency (e.g., a coop or municipally owned utility);

viii. Buildings and facilities used for the general conduct of government (e.g., city halls, courthouses, and emergency operation centers);

ix. By law, (codified in the HCD Act as a note to 105(a)), the amount of CDBG-MIT funds that may be contributed to a USACE project is $250,000 or less;

x. Section 582 of the National Flood Insurance Reform Act of 1994, as amended, (42 U.S.C. 5154a) prohibits flood disaster assistance in certain circumstances. In general, it provides that no federal disaster relief assistance made available in a flood disaster area may be used to make a payment (including any loan assistance payment) to a person for ''repair, replacement, or restoration'' for damage to any personal, residential, or commercial property if that person at any time has received federal flood disaster assistance that was conditioned on the person first having obtained flood insurance under applicable federal law and the person has

subsequently failed to obtain and maintain flood insurance as required under applicable federal law on such property. No disaster assistance may be provided for the repair, replacement, or restoration of a property to a person who has failed to meet this requirement;

xi. If the property is purchased through the use of eminent domain, the ultimate use of that property may not benefit a particular private party and must be for a public use; eminent domain can be used for public use, but public use shall not be construed to include economic development that primarily benefits private entities; and

xii. Incentive payments to households that move to disaster-impacted floodplains.

4.4.2.7 *Project Eligibility:*

i. Meets the definition of mitigation activities;

ii. Addresses identified current and future risks; mitigation related to severe coastal and riverine flooding, storms, tornadoes

iii. Meets the definition of a CDBG-eligible activity under title I of HCDA or otherwise pursuant to a waiver or alternative requirement;

iv. Meets a CDBG national objective;

v. Includes a plan for the long-term funding and management of the operations and maintenance of the project;

vi. Cost verification controls must be in place to assure that construction costs are reasonable and consistent with market costs at the time and place of construction.

4.4.2.8 *Program Guidelines for Residential Buyout or Acquisition Activities (Only):*

Each subrecipient will develop guidelines in accordance with CDBG-MIT requirements and regulations to set maximum assistance amounts, target area locations, Disaster Risk Reduction Area, and additional eligibility requirements. Guidelines must be posted for public comment before use. The GLO must approve all guidelines. Subrecipients are required to develop and follow a RARAP. With respect to the buyout of properties, an "intended, planned, or designated project area," as referenced at 49 CFR24.l0l(b)(l)(ii), shall be an area for which a clearly defined end use has been determined at the time that the property is acquired, in which all or substantially all of the properties within the area must be acquired within an established time period as determined by the grantee or acquiring entity for the project to move forward. Subrecipients may adopt program guidelines used for the Local Buyout and Acquisition Program administered under the State of Texas Plan for Disaster Recovery: Hurricane Harvey for $5.676 billion in CDBG-DR funding. With respect to the buyout of properties, an "intended, planned, or designated project area," as referenced at 49 CFR24.l0l(b)(l)(ii), shall be an area for which a clearly defined end use has been determined at the time that the property is acquired, in which all or substantially all of the

properties within the area must be acquired within an established time period as determined by the grantee or acquiring entity for the project to move forward.

In a Disaster Risk Reduction Area:

i. The hazard must have been caused or exacerbated by the Presidentially declared disaster for which the grantee received its CDBG-MIT allocation;

ii. The hazard must be a predictable environmental threat to the safety and well-being of program beneficiaries, as evidenced by the best available data (e.g., FEMA RL Data) and science; and

iii. The Disaster Risk Reduction Area must be clearly delineated so that HUD and the public may easily determine which properties are located within the designated area. The distinction between buyouts and other types of acquisitions is important, because subrecipient may only redevelop an acquired property if the property is not acquired through a buyout program (i.e., the purpose of acquisition was something other than risk reduction). When properties are not acquired through a buyout program, the purchase price must be consistent with applicable uniform cost principles (and the pre-disaster FMV may not be used)

iv. In carrying out acquisition activities, subrecipient must ensure they are in compliance with their long-term redevelopment and FEMA Approved Hazard Mitigation plans.

4.4.2.9 *Selection Criteria:*

Table 4-3: 2016 Floods State Mitigation Competition Scoring Criteria

Criteria	Maximum Points
County Composite Disaster Index	10 Points Possible
Top 10%	*10 Points*
Top 25%	*8 Points*
Top 75%	*5 Points*
Bottom 25%	*2 Points*
Bottom 10%	*0 Points*
Social Vulnerability Index	10 Points Possible
High	*10 Points*
Medium High	*8 Points*
Medium	*5 Points*
Medium Low	*2 Points*

Criteria	Maximum Points
Low	*0 Points*
Per Capita Market Value	10 Points Possible
Less than $95,000.00	*10 Points*
$95,000.01 - $140,000.00	*8 Points*
$140,000.01 - $200,000.00	*5 Points*
$200,000.01 - $425,000.00	*2 Points*
$425,000.01 or greater	*0 Points*
LMI National Objective	20 Points Possible
Project meets LMI national objective	20 Points
Project does not meet LMI national objective	0 Points
Project Identified in Local Adopted Plan	5 Points Possible
Project identified in local adopted plan	5 Points
Project not identified	0 Points
Management Capacity	15 Points Possible
No CDBG contracts with GLO (management capacity assessment)	Up to 15 Points
Performance on GLO CDBG contract(s), programs and/or projects	Up to 15 Points
Project Impact	25 Points Possible
Total project application amount per total project beneficiaries	15 Points
Percentage of total project beneficiaries out of the total population within a jurisdiction(s)	10 Points
Leverage	5 Points Possible
Non-CDBG Leverage (a minimum value of 1% of the CDBG-MIT funds requested)	5 Points
Tie-breaker: Higher Poverty Rate	
*More details on scoring criteria will be available in the application guidelines.	
**Applications that do not score a minimum of 65 points will only be considered after all applications scoring greater than this amount have been funded.	

4.4.2.10 *National Objectives:* UNM, LMI, low/mod buyout (LMB), and low/mod incentive; at least fifty (50) percent of funds must benefit LMI persons.

4.4.2.11 *AFFH Review:*

All proposed projects will undergo AFFH review by the GLO before approval. Such review will include assessments of (1) a proposed project's area demography, (2) socioeconomic characteristics, (3) housing configuration and needs, (4) educational, transportation, and health care opportunities, (5) environmental hazards or concerns, and (6) all other factors material to the AFFH determination. Applications should show that projects are likely to lessen area racial, ethnic, and low-income concentrations, and/or promote affordable housing in low-poverty, nonminority areas in response to natural hazard-related impacts.

4.4.2.12 *Timeline:* The proposed program start date is 1 month after HUD's approval of this Action Plan. The proposed end date is 4 years from the start date of the program.

4.4.3 HURRICANE HARVEY STATE MITIGATION COMPETITION

The GLO will conduct a mitigation competition to address risks in the Hurricane Harvey HUD MID and State MID areas. Entities may coordinate activities and submit a joint project that crosses jurisdictional boundaries. Each applicant may submit a total of three individual applications and three joint applications. Each application must consist of one project. Depending on demand, no applicant will be awarded for their subsequent application until all successful eligible applicants have been awarded funding at least once. If an applicant is eligible for multiple MIT-program competitions (e.g., 2015 or 2016 Competitions), the same project(s) cannot be submitted in each competition. If a project is a phase of a larger project, the phase of the project submitted must be viable as a stand-alone project. Applicants are encouraged to incorporate nature-based solutions, including natural or green infrastructure, into their proposed projects.

The competition may be comprised of multiple distinct rounds wherein applicants will submit a proposed project for each round that will be scored against the other submittals from that round.

The GLO reserves the option to delay award(s) to ensure that at least fifty (50) percent of funds benefit LMI persons and at least fifty (50) percent of funds address identified risks in the Hurricane Harvey HUD MID areas (counties and ZIP codes).

4.4.3.1 *Connection to Identified Risk:*

As outlined in the Mitigation Needs Assessment, hurricanes/tropical storms/tropical depressions, and severe coastal/riverine flooding are the top 2 severe risks to which Texas has the greatest exposure. Each proposed project must mitigate against one of these identified risks.

4.4.3.2 *Covered Projects:*

Defined as an infrastructure project having a total project cost of $100 million or more, with at least $50 million of CDBG funds, regardless of source (CDBG-DR, CDBG-MIT, or CDBG). When a Covered Project is proposed, the action plan or substantial amendment must include a description of the project and the information required for other CDBG-MIT activities (how it meets the definition of a mitigation activity, consistency with the Mitigation Needs Assessment provided in the grantee's action plan, eligibility under section 105(a) of the HCDA or a waiver or alternative requirement, and national objective, including additional criteria for mitigation activities). Additionally, the action plan must describe how the Covered Project meets additional criteria for national objectives for Covered Projects including: consistency with other mitigation activities in the same MID area; demonstrated long-term efficacy and sustainability of the project including its operations and maintenance; and a demonstration that the benefits of the Covered Project outweigh the costs. There may be a delay in award of any Covered Project to add project details in a subsequent substantial amendment.

4.4.3.3 *Allocation Amount:* $2,144,776,720

i. At least fifty (50) percent of funds must address identified risks in the Hurricane Harvey HUD MID areas (counties and ZIP codes);

ii. Up to fifty (50) percent of funds may address identified risks in the Hurricane Harvey State MID counties; and

iii. Additional areas within counties not explicitly cited as eligible may also become locations of Hurricane Harvey CDBG-MIT funded activities if it can be demonstrated how the expenditure of CDBG-MIT funds in that area will measurably mitigate risks identified within an eligible area (e.g., upstream water retention projects to reduce downstream flooding in an eligible area). Applicants may come from outside of the Hurricane Harvey HUD MID and State MID areas but must enter into an interlocal agreement or memorandum of understanding with a Hurricane Harvey HUD MID or State MID governmental entity representing an area that the project measurably mitigates.

4.4.3.4 *Award Amount:*

i. Maximum Project Amount: $100,000,000

ii. Minimum Project Amount: $3,000,000

4.4.3.5 *Eligible Applicants:*

i. Units of local government (cities and counties);

ii. Indian tribes;

iii. Councils of governments;

iv. State agencies;

v. Special purpose districts including, but not limited to:

vi. municipal utility districts;

vii. water control and improvement districts;

viii. special utility districts;

ix. flood and drainage districts; and

x. navigation districts.

xi. Port authorities; and

xii. River authorities.

4.4.3.6 *Eligible Activities: All activities allowed under CDBG-MIT; HCDA Section 105(a) (1-5), 105(a) (7-9), and 105(a)(11), including but not limited to:*

i. Flood control and drainage improvements, including the construction or rehabilitation of stormwater management system;

ii. Infrastructure improvements (such as water and sewer facilities, streets, provision of generators, removal of debris, bridges, etc.);

iii. Natural or green infrastructure;

iv. Communications infrastructure;

v. Public Facilities;

vi. Buyouts or Acquisition with or without relocation assistance, down payment assistance, housing incentives, and demolition;

vii. Housing incentives;

viii. Activities designed to relocate families outside of floodplains;

ix. Public service within the 15 percent cap (e.g., housing counseling, legal counseling, job training, mental health, and general health services);

x. FEMA Hazard Mitigation Grant Program (HMGP) cost share for CDBG-MIT eligible project;

xi. Economic development (assistance to businesses for the installation of disaster mitigation improvements and technologies; financing to support the development of technologies, systems and other measures to mitigate future disaster impacts; ‘‘hardening’’ of commercial areas and facilities; and financing critical infrastructure sectors to allow continued commercial operations during and after disasters); and

xii. Nonresidential structures must be elevated to the standards described in this paragraph or floodproofed, in accordance with FEMA floodproofing standards at 44 CFR 60.3(c)(3)(ii) or successor standard, up to at least two feet above the 100-year (or 1 percent annual chance) floodplain. All Critical Actions, as defined at 24 CFR 55.2(b)(3), within the 500-year (or 0.2 percent annual chance) floodplain must be elevated or floodproofed (in accordance with the FEMA standards) to the higher of the 500-year floodplain elevation or 3 feet above the 100-year floodplain elevation. If the 500-year floodplain or elevation is unavailable, and the Critical Action is in the 100-year floodplain, then the structure must be elevated or floodproofed at least 3 feet above the 100-year floodplain elevation. Critical Actions are defined as an ‘‘activity for which even a slight chance of flooding would be too great, because such flooding might result in loss of life, injury to

persons or damage to property.'' For example, Critical Actions include hospitals, nursing homes, police stations, fire stations and principal utility lines.

4.4.3.7 *Ineligible Activities*

i. Emergency response services. Emergency response services shall mean those services that are carried out in the immediate response to a disaster or other emergency in order to limit the loss of life and damage to assets by state and local governmental and nongovernmental emergency public safety, fire, law enforcement, emergency response, emergency medical (including hospital emergency facilities), and related personnel, agencies, and authorities;

ii. CDBG-MIT funds may not be used to enlarge a dam or levee beyond the original footprint of the structure that existed prior to the disaster event. CDBG-MIT funds for levees and dams are required to:

iii. Register and maintain entries regarding such structures with the USACE National Levee Database or National Inventory of Dams;

iv. Ensure that the structure is admitted in the USACE PL 84–99 Rehabilitation Program (Rehabilitation Assistance for Non-Federal Flood Control Projects);

v. Ensure the structure is accredited under the FEMA NFIP; and

vi. Maintain file documentation demonstrating a risk assessment prior to funding the flood control structure and documentation that the investment includes risk reduction measures.

vii. Funds may not be used to assist a privately owned utility for any purpose. A private utility, also referred to as an investor-owned utility, is owned by private investors and is for-profit as opposed to being owned by a public trust or agency (e.g., a coop or municipally owned utility);

viii. Buildings and facilities used for the general conduct of government (e.g., city halls, courthouses, and emergency operation centers);

ix. By law, (codified in the HCD Act as a note to 105(a)), the amount of CDBG-MIT funds that may be contributed to a USACE project is $250,000 or less;

x. Section 582 of the National Flood Insurance Reform Act of 1994, as amended, (42 U.S.C. 5154a) prohibits flood disaster assistance in certain circumstances. In general, it provides that no federal disaster relief assistance made available in a flood disaster area may be used to make a payment (including any loan assistance payment) to a person for ''repair, replacement, or restoration'' for damage to any personal, residential, or commercial property if that person at any time has received federal flood disaster assistance that was conditioned on the person first having obtained flood insurance under applicable federal law and the person has

subsequently failed to obtain and maintain flood insurance as required under applicable federal law on such property. No disaster assistance may be provided for the repair, replacement, or restoration of a property to a person who has failed to meet this requirement;

xi. Funding shall not be used to reimburse homeowners, businesses or entities (other than grantees, local governments, and subrecipients described above) for mitigation activities completed prior to the applicability date of the federal register notice;

xii. If the property is purchased through the use of eminent domain, the ultimate use of that property may not benefit a particular private party and must be for a public use; eminent domain can be used for public use, but public use shall not be construed to include economic development that primarily benefits private entities; and

xiii. Incentive payments to households that move to disaster-impacted floodplains.

4.4.3.8 *Project Eligibility:*

i. Meets the definition of mitigation activities;

ii. Addresses identified current and future risks; mitigation related to hurricanes, tropical storms, and depressions, and severe coastal/riverine flooding;

iii. Meets the definition of a CDBG-eligible activity under title I of HCDA or otherwise pursuant to a waiver or alternative requirement;

iv. Meets a CDBG national objective;

v. Includes a plan for the long-term funding and management of the operations and maintenance of the project; and

vi. Cost verification controls must be in place to assure that construction costs are reasonable and consistent with market costs at the time and place of construction.

4.4.3.9 *Program Guidelines for Residential Buyout or Acquisition Activities (Only):*

Each subrecipient will develop guidelines in accordance with CDBG-MIT requirements and regulations to set maximum assistance amounts, target area locations, Disaster Risk Reduction Area, and additional eligibility requirements. Guidelines must be posted for public comment before use. The GLO must approve all guidelines. Subrecipients are required to develop and follow a RARAP. Subrecipients may adopt program guidelines used for the Local Buyout and Acquisition Program administered under the State of Texas Plan for Disaster Recovery: Hurricane Harvey for $5.676 billion in CDBG-DR funding. With respect to the buyout of properties, an “intended, planned, or designated project area,” as referenced at 49 CFR24.l0l(b)(l)(ii), shall be an area for which a clearly defined end use has been determined at the time that the property is acquired, in which all or substantially all of the properties within the area must be acquired within an

established time period as determined by the grantee or acquiring entity for the project to move forward.

In a Disaster Risk Reduction Area:

i. The hazard must have been caused or exacerbated by the Presidentially declared disaster for which the grantee received its CDBG-MIT allocation;

ii. The hazard must be a predictable environmental threat to the safety and well-being of program beneficiaries, as evidenced by the best available data (e.g., FEMA RL Data) and science;

iii. The Disaster Risk Reduction Area must be clearly delineated so that HUD and the public may easily determine which properties are located within the designated area. The distinction between buyouts and other types of acquisitions is important, because subrecipient may only redevelop an acquired property if the property is not acquired through a buyout program (i.e., the purpose of acquisition was something other than risk reduction). When properties are not acquired through a buyout program, the purchase price must be consistent with applicable uniform cost principles (and the pre-disaster FMV may not be used); and

iv. In carrying out acquisition activities, subrecipient must ensure they are in compliance with their long-term redevelopment and FEMA-approved Hazard Mitigation plans.

4.4.3.10 *Selection Criteria:*

Table 4-4: Hurricane Harvey State Mitigation Competition Scoring Criteria

Criteria	Maximum Points
County Composite Disaster Index	10 Points Possible
Top 10%	*10 Points*
Top 25%	*8 Points*
Top 75%	*5 Points*
Bottom 25%	*2 Points*
Bottom 10%	*0 Points*
Social Vulnerability Index	10 Points Possible
High	*10 Points*
Medium High	*8 Points*
Medium	*5 Points*
Medium Low	*2 Points*

Criteria	Maximum Points
Low	*0 Points*
Per Capita Market Value	10 Points Possible
Less than $95,000.00	*10 Points*
$95,000.01 - $140,000.00	*8 Points*
$140,000.01 - $200,000.00	*5 Points*
$200,000.01 - $425,000.00	*2 Points*
$425,000.01 or greater	*0 Points*
LMI National Objective	20 Points Possible
Project meets LMI national objective	20 Points
Project does not meet LMI national objective	0 Points
Project Identified in Local Adopted Plan	5 Points Possible
Project identified in local adopted plan	5 Points
Project not identified	0 Points
Management Capacity	15 Points Possible
No CDBG contracts with GLO (management capacity assessment)	Up to 15 Points
Performance on GLO CDBG contract(s), programs and/or projects	Up to 15 Points
Project Impact	25 Points Possible
Total project application amount per total project beneficiaries	15 Points
Percentage of total project beneficiaries out of the total population within a jurisdiction(s)	10 Points
Leverage	5 Points Possible
Non-CDBG Leverage (a minimum value of 1% of the CDBG-MIT funds requested)	5 Points
Mitigation/Resiliency Measures	5 Points Possible
Measures taken by applicant	5 Points
Tie-Breaker: Higher Poverty Rate	
*More details on scoring criteria will be available in the application guidelines.	
**Applications that do not score a minimum of 65 points will only be considered after all applications scoring greater than this amount have been funded.	

4.4.3.11 *National Objectives:* UNM, LMI, low/mod buyout (LMB), and low/mod incentive; at least fifty (50) percent of funds must benefit LMI persons.

4.4.3.12 *AFFH Review:*

All proposed projects will undergo AFFH review by the GLO before approval. Such review will include assessments of (1) a proposed project's area demography, (2) socioeconomic characteristics, (3) housing configuration and needs, (4) educational, transportation, and health care opportunities, (5) environmental hazards or concerns, and (6) all other factors material to the AFFH determination. Applications should show that projects are likely to lessen area racial, ethnic, and low-income concentrations, and/or promote affordable housing in low-poverty, nonminority areas in response to natural hazard-related impacts.

4.4.3.13 *Timeline:* The proposed program start date is 1 month after HUD's approval of this Action Plan. The proposed end date is 10 years from the start date of the program.

4.4.4 Regional Mitigation Program (COG MODs)

Under the Regional Mitigation program (COG MODs), each COG region impacted by Hurricane Harvey has been allocated funds. Each COG will develop a local MOD for allocation of funds to local units of government and Indian tribes. The GLO encourages the prioritization of regional investments with regional impacts in risk reduction for hurricanes, tropical storms and depressions, flooding, wind and other hazards to develop disaster-resistant infrastructure; upgrading of water, sewer, solid waste, communications, energy, transportation, health and medical, and other public infrastructure to address specific, identified risks; financing multi-use infrastructure; and green or natural mitigation infrastructure development.

Due to the nature of this activity, this program will be administered by the GLO, with local units of governments (cities and counties) as subrecipients.

The MOD developed through the COGs allows for the opportunity for local quantifiable factors for the distribution of funds. Given the size of the impacted area, how disaster impact each region differently, and the risks in each region, local control through a regional approach is vital for a comprehensive mitigation approach.

The GLO will provide training, written guidance, and required forms to the impacted COGs for the development of the local MODs. Each COG will be provided data sets produced by the GLO to inform the MOD. Variances from these data sets will be allowable upon approval from the GLO. Data sets provided by the GLO may contain information at the county, city, and/or ZIP code level. If a COG is unable to develop the MOD, the GLO complete the MOD for the COG region.

Local MOD guidelines will require that each COG follow a citizen participation process. Each COG is required to publish notice of any public hearings prior to holding the hearings. Notices shall be published in all newspapers of record for all eligible counties in the region, posted on the COG website, and provided to all eligible cities, counties, and Indian tribes in the region. Hearings must fully comply with the Texas Open Meetings Act.

The GLO will review and provide preliminary approval to each MOD prior to its posting by the COG for public comment. The MOD shall be posted on the COG's website for public comment prior to formal submission to the GLO. The public comment period shall be no less than 15 days. Each comment shall be responded to and any changes made to the MOD shall be noted in the response section for GLO review. The GLO will set the due date for completion of the MODs.

Upon completion, the GLO will review and approve MOD submissions by each COG. All MODs will be wholly reviewed to ensure that each COG provides a detailed description of the methodology used to allocate and prioritize funds within their regions. If the MOD is not approved, the GLO will provide feedback to the COG, including specific issues.

The GLO used census data, the composite disaster index (CDI), SoVI, and property tax data from the state comptroller's office to distribute funds to the impacted COG regions. The MOD distribution factors establish a balance between the risk faced by communities from natural hazards, the vulnerability of the population in eligible communities, the financial capacity to recover, and the relative population. The methodology for the distribution and calculation is located the Appendix F.

4.4.4.1 *Connection to Identify Risk:*

As outlined in Mitigation Needs Assessment, hurricanes/tropical storms/tropical depressions, and severe coastal/riverine flooding are the top two severe risks Texas experiences. Each proposed project must mitigate against one of these identified risks.

4.4.4.2 *Allocation Amount:* $500,000,000

i. At least fifty (50) percent of funds must address identified risks in the Hurricane Harvey HUD MID areas (counties and HUD MID ZIP codes counties);

ii. Up to fifty (50) percent of funds may address identified risks in the Hurricane Harvey State MID areas (counties); and

iii. Additional areas within counties not explicitly cited as eligible may also become locations of CDBG-MIT funded activities if it can be demonstrated how the expenditure of CDBG-MIT funds in that area will measurably mitigate risks identified within an eligible area (e.g., upstream water retention projects to reduce downstream flooding in an eligible area).

4.4.4.3 *Maximum Award Amount:*

The maximum award will be determined by the local MOD.

4.4.4.4 *Eligible Entities:* Units of local government (cities and counties) and Indian Tribes

4.4.4.5 *Local MOD Requirements:*

i. Each COG will facilitate the MOD process with GLO support;

ii. Establish objective criteria for allocation of funds to eligible entities or activities;

iii. Citizen participation process;

iv. Develop a citizen participation plan;

v. GLO will review and provide preliminary approval to MOD prior to COG's public comment period;

vi. Conduct a minimum of two (2) public hearings prior to finalizing the MOD;

vii. One (1) public hearing shall be a "Public Planning Meeting;"

viii. Ensure a public comment period of at least 15 days;

ix. Implement a minimum of $1,000,000 in CDGB-MIT funds to any local entity receiving funding through the MOD. COGs may submit a waiver request with justification to lower minimum to the GLO;

x. Ensure a minimum percentage of funds are allocated to Hurricane Harvey HUD MID Counties and ZIP codes;

xi. Facilitate local prioritization through the MOD;

xii. Connection to regional mitigation needs assessment and risk;

xiii. Identify set asides for regional mitigation priorities and regional projects;

xiv. Identify Covered Project(s);

xv. A plan to meet the 50 percent LMI benefit requirement; and

xvi. Establish any additional parameters for eligibility beyond what is required by HUD or the GLO.

4.4.4.6 *Eligible Activities: All activities allowed under CDBG-MIT; HCDA Section 105(a) (1-5), 105(a) (7-9), and 105(a)(11), including but not limited to:*

i. Flood control and drainage improvements, including the construction or rehabilitation of stormwater management system;

ii. Infrastructure improvements (such as water and sewer facilities, streets, provision of generators, removal of debris, bridges, etc.);

iii. Natural or green infrastructure;

iv. Communications infrastructure;

v. Public facilities;

vi. Buyouts or Acquisition with or without relocation assistance, down payment assistance, housing incentives, and demolition;

vii. Activities designed to relocate families outside of floodplains;

viii. Public service within the 15 percent cap (e.g., housing counseling, legal counseling, job training, mental health, and general health services);

ix. FEMA Hazard Mitigation Grant Program (HMGP) cost share for CDBG-MIT eligible project;

x. Economic development (assistance to businesses for the installation of disaster mitigation improvements and technologies; financing to support the development

of technologies, systems and other measures to mitigate future disaster impacts; ‘‘hardening’’ of commercial areas and facilities; and financing critical infrastructure sectors to allow continued commercial operations during and after disasters); and

xi. Nonresidential structures must be elevated to the standards described in this paragraph or floodproofed, in accordance with FEMA floodproofing standards at 44 CFR 60.3(c)(3)(ii) or successor standard, up to at least two feet above the 100-year (or 1 percent annual chance) floodplain. All Critical Actions, as defined at 24 CFR 55.2(b)(3), within the 500-year (or 0.2 percent annual chance) floodplain must be elevated or floodproofed (in accordance with the FEMA standards) to the higher of the 500-year floodplain elevation or 3 feet above the 100-year floodplain elevation. If the 500-year floodplain or elevation is unavailable, and the Critical Action is in the 100-year floodplain, then the structure must be elevated or floodproofed at least 3 feet above the 100-year floodplain elevation. Critical Actions are defined as an ‘‘activity for which even a slight chance of flooding would be too great, because such flooding might result in loss of life, injury to persons or damage to property.’’ For example, Critical Actions include hospitals, nursing homes, police stations, fire stations and principal utility lines.

4.4.4.7 *Ineligible Activities:*

i. Emergency response services. Emergency response services shall mean those services that are carried out in the immediate response to a disaster or other emergency in order to limit the loss of life and damage to assets by state and local governmental and nongovernmental emergency public safety, fire, law enforcement, emergency response, emergency medical (including hospital emergency facilities), and related personnel, agencies, and authorities;

ii. CDBG-MIT funds may not be used to enlarge a dam or levee beyond the original footprint of the structure that existed prior to the disaster event. CDBG-MIT funds for levees and dams are required to:

iii. Register and maintain entries regarding such structures with the USACE National Levee Database or National Inventory of Dams;

iv. Ensure that the structure is admitted in the USACE PL 84–99 Rehabilitation Program (Rehabilitation Assistance for Non-Federal Flood Control Projects);

v. Ensure the structure is accredited under the FEMA NFIP; and

vi. Maintain file documentation demonstrating a risk assessment prior to funding the flood control structure and documentation that the investment includes risk reduction measures.

vii. Funds may not be used to assist a privately owned utility for any purpose. A private utility, also referred to as an investor-owned utility, is owned by private investors and is for-profit as opposed to being owned by a public trust or agency (e.g., a coop or municipally owned utility);

viii. Buildings and facilities used for the general conduct of government (e.g., city halls, courthouses, and emergency operation centers);

ix. By law, (codified in the HCD Act as a note to 105(a)), the amount of CDBG-MIT funds that may be contributed to a USACE project is $250,000 or less;

x. Section 582 of the National Flood Insurance Reform Act of 1994, as amended, (42 U.S.C. 5154a) prohibits flood disaster assistance in certain circumstances. In general, it provides that no federal disaster relief assistance made available in a flood disaster area may be used to make a payment (including any loan assistance payment) to a person for ‘‘repair, replacement, or restoration’’ for damage to any personal, residential, or commercial property if that person at any time has received federal flood disaster assistance that was conditioned on the person first having obtained flood insurance under applicable federal law and the person has subsequently failed to obtain and maintain flood insurance as required under applicable federal law on such property. No disaster assistance may be provided for the repair, replacement, or restoration of a property to a person who has failed to meet this requirement;

xi. If the property is purchased through the use of eminent domain, the ultimate use of that property may not benefit a particular private party and must be for a public use; eminent domain can be used for public use, but public use shall not be construed to include economic development that primarily benefits private entities; and

xii. Incentive payments to households that move to disaster-impacted floodplains.

4.4.4.8 *Program Guidelines for Residential Buyout or Acquisition Activities (Only):*

Each subrecipient will develop guidelines in accordance with CDBG-MIT requirements and regulations to set maximum assistance amounts, target area locations, Disaster Risk Reduction Area, and additional eligibility requirements. Guidelines must be posted for public comment before use. The GLO must approve all guidelines. Subrecipients are required to develop and follow a RARAP. Subrecipients may adopt program guidelines used for the Local Buyout and Acquisition Program administered under the State of Texas Plan for Disaster Recovery: Hurricane Harvey for $5.676 billion in CDBG-DR funding. With respect to the buyout of properties, an “intended, planned, or designated project area,” as referenced at 49 CFR 24.l0l(b)(l)(ii), shall be an area for which a clearly defined end use has been determined at the time that the property is acquired, in which all or substantially all of the properties within the area must be acquired within an

established time period as determined by the grantee or acquiring entity for the project to move forward.

To conduct a buyout in a Disaster Risk Reduction Area, the subrecipient must establish criteria in its policies and procedures to designate the area subject to the buyout, pursuant to the following requirements:

i. The hazard must have been caused or exacerbated by the Presidentially declared disaster for which the grantee received its CDBG-MIT allocation;

ii. The hazard must be a predictable environmental threat to the safety and well-being of program beneficiaries, as evidenced by the best available data (e.g., FEMA RL Data) and science;

iii. The Disaster Risk Reduction Area must be clearly delineated so that HUD and the public may easily determine which properties are located within the designated area. The distinction between buyouts and other types of acquisitions is important, because subrecipient may only redevelop an acquired property if the property is not acquired through a buyout program (i.e., the purpose of acquisition was something other than risk reduction); and

iv. In carrying out acquisition activities, subrecipient must ensure they are in compliance with their long-term redevelopment plans.

4.4.4.9 *Project Eligibility:*

i. Meets the definition of mitigation activities;

ii. Addresses the current and future risks identified; Mitigation related to Hurricanes, Tropical Storms and Tropical Depressions, and Severe Coastal and Riverine Flooding;

iii. Meets the definition of a CDBG-eligible activity under title I of HCDA or otherwise pursuant to a waiver or alternative requirement;

iv. Meets a CDBG national objective;

v. Includes a plan for the long-term funding and management of the operations and maintenance of the project; and

vi. Cost verification controls must be in place to assure that construction costs are reasonable and consistent with market costs at the time and place of construction.

4.4.4.10 *National Objectives*: UNM, LMI, low/mod buyout (LMB), and low/mod incentive; at least fifty (50) percent of funds must benefit LMI persons.

4.4.4.11 *AFFH Review:*

All proposed projects will undergo AFFH review by the GLO before approval. Such review will include assessments of (1) a proposed project's area demography, (2) socioeconomic characteristics, (3) housing configuration and needs, (4) educational, transportation, and health care opportunities, (5) environmental hazards or concerns, and (6) all other factors material to the AFFH determination. Applications should show that projects are likely to lessen area racial, ethnic, and low-income concentrations, and/or promote affordable housing in low-poverty, nonminority areas in response to natural hazard-related impacts.

4.4.4.12 *Timeline:*

The proposed program start date is 1 month after HUD's approval of this Action Plan. The proposed end date is 6 years from the start date of the program.

4.4.5 Hazard Mitigation Grant Program (HMGP): Supplemental

The Hazard Mitigation Grant Program (HMGP) is one of the three FEMA Hazard Mitigation Assistance (HMA) grant programs. HMGP is administered by the Texas Division of Emergency Management (TDEM). The HMGP supports cost-effective post-disaster projects and is the longest running mitigation program among the three FEMA grant programs. FEMA defines hazard mitigation measures as any sustainable action taken to reduce or eliminate long-term risk to people and property from future disasters. The purpose of the HMGP is to help communities implement hazard mitigation measures following a Presidential disaster declaration in areas requested by the governor. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

The state has the primary responsibility for prioritizing, selecting, and administering state and local hazard mitigation projects. *HMGP provides up to 75 percent of the eligible costs associated with hazard mitigation projects selected for funding. Selected subrecipients must contribute at least 25 percent of the total project costs, known as match or non-federal share. Eligibility to participate in the HMGP requires jurisdictions to have a FEMA-approved Local Hazard Mitigation Plan (LHMP). There are a variety of other requirements as well, including current participation in the NFIP for all projects located in a mapped special flood hazard area. Projects to protect either public or private property are eligible for HMGP funding and can include the following:

i. Acquisition/demolition/elevation of flood-prone structures;
ii. Community and individual safe room programs;
iii. Retrofitting facilities (flood proofing, high wind, seismic, etc.);
iv. Small-scale structural hazard control/protection projects;
v. Emergency generators; and
vi. Post-disaster code enforcement.

Limited funding is also available for the following:

i. Initiative projects such as public awareness, enhanced hazard information systems, enhanced warning capabilities, etc.; and
ii. Development of state and local HMPs, including studies to enhance a community's understanding of risk (examples: dam inundation studies, flood studies).

Following Hurricane Harvey (DR-4332), the state of Texas received over $800 million for HMGP funds. As part of the program, a Notice of Intent (NOI) was initiated by TDEM to conduct a pre-screening on projects that may be considered. Following the NOI process, TDEM identified potential applicants and asked that HMGP applications be submitted. TDEM then reviewed the HMGP project applications and the state selected projects to fund.

This HMGP Supplemental Program will provide CDBG-MIT funding for HMGP projects that were unable to receive funding through the HMGP program. Each of these projects will meet the HUD definition for mitigation as well as the additional requirements of a CDBG-MIT project. Housing activities will meet and follow CDBG-MIT requirements. This program will prioritize projects that meet the low and-moderate income national objective and projects that are in the Hurricane Harvey HUD MID areas. The 25 percent non-federal cost share is not required for the HMGP Supplemental.

Due to the nature of these activities and the complexities of CDBG-MIT rules and regulations, this program will be administered by the GLO with applicants as subrecipients.

Under this HMGP Supplemental Program, the GLO will work closely with TDEM in the selection of projects based on the criteria outlined below. Once project selections have been made, the GLO will post the list of selected projects on the recovery.texas.gov website.

Projects selected for funding will need to submit supplemental application materials to verify CDBG-MIT eligibility.

4.4.5.1 *Connection to Identified Risk:*

As outlined in Mitigation Needs Assessment, hurricanes/tropical storms/tropical depressions, and severe coastal/riverine flooding are the top two severe risks Texas experiences. The Hurricane Harvey HMGP funding in 2017 required communities to address risks identified in their Local Hazard Mitigation Action Plans.

4.4.5.2 *Covered Projects:*

Defined as an infrastructure project having a total project cost of $100 million or more, with at least $50 million of CDBG funds, regardless of source (CDBG-DR, CDBG-MIT, or CDBG). The action plan or substantial amendment must include a description of the project and the information required for other CDBG-MIT activities (how it meets the definition of a mitigation activity, consistency with the Mitigation Needs Assessment provided in the grantee's action plan, eligibility under section 105(a) of the HCDA or a waiver or alternative requirement, and national objective, including additional criteria for mitigation activities). Additionally, the action plan must describe how the Covered Project meets additional criteria for national objectives for Covered Projects (described in V.A.13. below) including: consistency with other mitigation activities in the same MID area; demonstrated long-term efficacy and sustainability of the project including its operations and maintenance; and a demonstration that the benefits of the Covered Project outweigh the costs.

4.4.5.3 *Allocation Amount:* $170,000,000

i. At least fifty (50) percent of funds must address mitigation efforts in the Hurricane Harvey HUD MID areas (counties and ZIP codes); and

ii. Up to fifty (50) percent of funds may address mitigation efforts in the Hurricane Harvey State MID counties and counties minus the HUD MID ZIP codes.

4.4.5.4 *Maximum Award Amount:* $170,000,000

4.4.5.5 *Eligible Entities:* FEMA HMGP eligible applicants.

4.4.5.6 *Eligible Activities: All activities allowed under CDBG-MIT; HCDA Section 105(a) (1-5), 105(a) (7-9), and 105(a)(11), 105(a) (24-25), including but not limited to:*

i. Buyouts;

ii. Relocation Assistance with buyout activities;

iii. Demolition with buyout activities;

iv. Housing incentives;

v. Activities designed to relocate families outside of floodplains;

vi. Flood control and drainage improvements, including the construction or rehabilitation of stormwater management system;

vii. Infrastructure improvements (such as water and sewer facilities, streets, provision of generators, removal of debris, bridges, etc.);

viii. Natural or green infrastructure;

ix. Communications infrastructure;

x. Public facilities; and

xi. Nonresidential structures must be elevated to the standards described in this paragraph or floodproofed, in accordance with FEMA floodproofing standards at 44 CFR 60.3(c)(3)(ii) or successor standard, up to at least two feet above the 100-year (or 1 percent annual chance) floodplain. All Critical Actions, as defined at 24 CFR 55.2(b)(3), within the 500-year (or 0.2 percent annual chance) floodplain must be elevated or floodproofed (in accordance with the FEMA standards) to the higher of the 500-year floodplain elevation or 3 feet above the 100-year floodplain elevation. If the 500-year floodplain or elevation is unavailable, and the Critical Action is in the 100-year floodplain, then the structure must be elevated or floodproofed at least 3 feet above the 100-year floodplain elevation. Critical Actions are defined as an ‘‘activity for which even a slight chance of flooding would be too great, because such flooding might result in loss of life, injury to

persons or damage to property.'' For example, Critical Actions include hospitals, nursing homes, police stations, fire stations and principal utility lines.

4.4.5.7 *Ineligible Activities:*

i. Properties that served as second homes at the time of the disaster, or following the disaster, are not eligible for rehabilitation assistance or incentives;

ii. Rehabilitation/reconstruction of homes located in the floodway;

iii. Rehabilitation/reconstruction of a house in which:

iv. The combined household income is greater than 120 percent AMI or the national median;

v. The property was located in a floodplain at the time of the disaster; and

vi. The property owner did not maintain flood insurance on the damaged property, even when the property owner was not required to obtained and maintain such insurance.

vii. Incentive payments to households that move to disaster-impacted floodplains;

viii. CDBG-MIT funds may not be used to enlarge a dam or levee beyond the original footprint of the structure that existed prior to the disaster event. CDBG-MIT funds for levees and dams are required to:

ix. Register and maintain entries regarding such structures with the USACE National Levee Database or National Inventory of Dams;

x. Ensure that the structure is admitted in the USACE PL 84–99 Rehabilitation Program (Rehabilitation Assistance for Non-Federal Flood Control Projects);

xi. Ensure the structure is accredited under the FEMA NFIP; and

xii. Maintain file documentation demonstrating a risk assessment prior to funding the flood control structure and documentation that the investment includes risk reduction measures.

xiii. Projects already funded by FEMA HMGP;

xiv. Funds may not be used to assist a privately owned utility for any purpose. A private utility, also referred to as an investor-owned utility, is owned by private investors and is for-profit as opposed to being owned by a public trust or agency (e.g., a coop or municipally owned utility);

xv. Buildings and facilities used for the general conduct of government (e.g., city halls, courthouses, and emergency operation centers);

xvi. By law, (codified in the HCD Act as a note to 105(a)), the amount of CDBG-DR funds that may be contributed to a USACE project is $250,000 or less;

xvii. Section 582 of the National Flood Insurance Reform Act of 1994, as amended, (42 U.S.C. 5154a) prohibits flood disaster assistance in certain circumstances. In general, it provides that no Federal disaster relief assistance made available in a flood disaster area may be used to make a payment (including any loan assistance payment) to a person for ‘‘repair, replacement, or restoration’’ for damage to any personal, residential, or commercial property if that person at any time has received federal flood disaster assistance that was conditioned on the person first having obtained flood insurance under applicable federal law and the person has subsequently failed to obtain and maintain flood insurance as required under applicable federal law on such property. No disaster assistance may be provided for the repair, replacement, or restoration of a property to a person who has failed to meet this requirement; and

xviii. If the property is purchased through the use of eminent domain, the ultimate use of that property may not benefit a particular private party and must be for a public use; eminent domain can be used for public use, but public use shall not be construed to include economic development that primarily benefits private entities.

4.4.5.8 *Program Requirements:*

i. Project has been submitted to TDEM for HMGP funding related to Hurricane Harvey;

ii. Be in a 2017 Hurricane Harvey CDBG-DR eligible county;

iii. Meets the definition of mitigation activities;

iv. Address the current and future risks identified in the Mitigation Needs Assessment;

v. Be CDBG-eligible activities under Title I of HCDA or otherwise pursuant to a waiver or alternative requirement;

vi. Meet a national objective;

vii. Plan for the long-term operation and maintenance; and

viii. Cost verification controls must be in place to assure that construction costs are reasonable and consistent with market costs at the time and place of construction.

4.4.5.9 *Program Guidelines for Residential Buyout (Only):*

Each subrecipient will develop guidelines in accordance with CDBG-MIT requirements and regulations to set maximum assistance amounts, target area locations, Disaster Risk Reduction Area, and additional eligibility requirements. Guidelines must be posted for public comment

before use. The GLO must approve all guidelines. Subrecipients are required to develop and follow a RARAP. Subrecipients may adopt program guidelines used for the Local Buyout and Acquisition Program administered under the State of Texas Plan for Disaster Recovery: Hurricane Harvey for $5.676 billion in CDBG-DR funding. With respect to the buyout of properties, an "intended, planned, or designated project area," as referenced at 49 CFR24.l0l(b)(l)(ii), shall be an area for which a clearly defined end use has been determined at the time that the property is acquired, in which all or substantially all of the properties within the area must be acquired within an established time period as determined by the grantee or acquiring entity for the project to move forward.

To conduct a buyout in a Disaster Risk Reduction Area, the subrecipient must establish criteria in its policies and procedures to designate the area subject to the buyout, pursuant to the following requirements:

i. The hazard must have been caused or exacerbated by the Presidentially declared disaster for which the grantee received its CDBG-MIT allocation;

ii. The hazard must be a predictable environmental threat to the safety and well-being of program beneficiaries, as evidenced by the best available data (e.g., FEMA RL Data) and science;

iii. The Disaster Risk Reduction Area must be clearly delineated so that HUD and the public may easily determine which properties are located within the designated area. The distinction between buyouts and other types of acquisitions is important, because subrecipients may only redevelop an acquired property if the property is not acquired through a buyout program (i.e., the purpose of acquisition was something other than risk reduction); and

iv. In carrying out acquisition activities, subrecipients must ensure they are in compliance with their long-term redevelopment plans.

4.4.5.10 *Selection Criteria:*

i. Projects must meet the definition of mitigation activities;

ii. Priority will be given to projects that meet the low and moderate income national objective;

iii. Projects that have a Benefit Costs Analysis (BCA) of over one (1), with projects that have higher BCAs being ranked higher; and

iv. Priority will be given to applicants that did not receive HMPG funding.

4.4.5.11 *National Objectives:* LMI, UNM, low/mod buyout (LMB), and low/mod incentive; at least fifty (50) percent of funds must benefit LMI persons.

4.4.5.12 *AFFH Review:*

All proposed projects will undergo AFFH review by the GLO before approval. Such review will include assessments of (1) a proposed project's area demography, (2) socioeconomic characteristics, (3) housing configuration and needs, (4) educational, transportation, and health care opportunities, (5) environmental hazards or concerns, and (6) all other factors material to the AFFH determination. Applications should show that projects are likely to lessen area racial, ethnic, and low-income concentrations, and/or promote affordable housing in low-poverty, nonminority areas in response to natural hazard-related impacts.

4.4.5.13 *Timeline:*

The proposed program start date is 3 months after HUD's approval of this Action Plan. The proposed end date is 4 years from the start date of the program.

4.4.6 COASTAL RESILIENCY PROGRAM

The GLO Coastal Resources division conducts ongoing coastal planning efforts through the Texas Coastal Resiliency Master Plan (Resiliency Plan) as described in Mitigation Needs Assessment. The Tier 1 projects recommended in the Resiliency Plan advance multifaceted, long-term resilience to identified coastal hazard risks through a combination of green infrastructure, gray infrastructure, and nonstructural measures. The prioritized projects in the Resiliency Plan were evaluated by regional Technical Advisory Committees comprised of coastal science researchers; state and federal natural resource agency personnel; members of public, private, and non-governmental organizations; local government representatives; and engineering and planning experts. The Resiliency Plan leverages project recommendations from other various federal, state, and local planning studies and informs federal and state funding approaches to enact long-term coastal resiliency.

4.4.6.1 *Connection to Identified Risk:*

As outlined in Mitigation Needs Assessment, hurricanes/tropical storms/tropical depressions, and severe coastal/riverine flooding are the top two severe weather-related hazard risks Texas experiences, with coastal erosion as an additionally identified natural-hazard risk. The Coastal Resiliency Program will specifically address mitigation measures to these risks along coastal areas of Texas. Once project selections have been made, the GLO will post the list of selected projects on the recovery.texas.gov website.

Example project types eligible to be implemented through this Coastal Resiliency Program include wetland protection and/or shoreline stabilization; beach nourishment and dune restoration; regional infrastructure improvements; land acquisitions; and oyster reef enhancements—all of which further mitigation.

4.4.6.2 *Allocation Amount:* $100,000,000

i. At least fifty (50) percent of funds must address identified risks in the Hurricane Harvey HUD MID areas (counties and ZIP codes); and

ii. Up to fifty (50) percent of funds may address identified risks in the Hurricane Harvey State MID counties and counties minus its HUD MID ZIP codes.

4.4.6.3 *Maximum Award Amount:* $60,000,000

4.4.6.4 *Eligible Entities:*

i. Units of local government (cities, towns, and counties);

ii. State agencies;

iii. Non-governmental organizations;

iv. Navigation districts; and

v. Port authorities.

4.4.6.5 *Eligible Activities: All activities allowed under CDBG-MIT; HCDA Section 105(a) (1-5), 105(a) (7-9), and 105(a)(11), including but not limited to:*

i. Flood control and drainage improvements, including the construction or rehabilitation of stormwater management system;

ii. Infrastructure improvements (such as water and sewer facilities, streets, shoreline armoring, etc.);

iii. Natural or green infrastructure;

iv. Land acquisitions and buyouts; and

v. Nonresidential structures must be elevated to the standards described in this paragraph or floodproofed, in accordance with FEMA floodproofing standards at 44 CFR 60.3(c)(3)(ii) or successor standard, up to at least two feet above the 100-year (or 1 percent annual chance) floodplain. All Critical Actions, as defined at 24 CFR 55.2(b)(3), within the 500-year (or 0.2 percent annual chance) floodplain must be elevated or floodproofed (in accordance with the FEMA standards) to the higher of the 500-year floodplain elevation or 3 feet above the 100-year floodplain elevation. If the 500-year floodplain or elevation is unavailable, and the Critical Action is in the 100-year floodplain, then the structure must be elevated or floodproofed at least 3 feet above the 100-year floodplain elevation. Critical Actions are defined as an ‘‘activity for which even a slight chance of flooding would be too great, because such flooding might result in loss of life, injury to persons or damage to property.’’ For example, Critical Actions include hospitals, nursing homes, police stations, fire stations and principal utility lines.

4.4.6.6 *Ineligible Activities:*

i. Emergency response services. Emergency response services shall mean those services that are carried out in the immediate response to a disaster or other emergency in order to limit the loss of life and damage to assets by state and local governmental and nongovernmental emergency public safety, fire, law enforcement, emergency response, emergency medical (including hospital emergency facilities), and related personnel, agencies, and authorities.

ii. CDBG-MIT funds may not be used to enlarge a dam or levee beyond the original footprint of the structure that existed prior to the disaster event. CDBG-MIT funds for levees and dams are required to:

iii. Register and maintain entries regarding such structures with the USACE National Levee Database or National Inventory of Dams;

iv. Ensure that the structure is admitted in the USACE PL 84–99 Rehabilitation Program (Rehabilitation Assistance for Non-Federal Flood Control Projects);

v. Ensure the structure is accredited under the FEMA NFIP; and

vi. Maintain file documentation demonstrating a risk assessment prior to funding the flood control structure and documentation that the investment includes risk reduction measures.

vii. Funds may not be used to assist a privately owned utility for any purpose. A private utility, also referred to as an investor-owned utility, is owned by private investors and is for-profit as opposed to being owned by a public trust or agency (e.g., a coop or municipally owned utility).

viii. Buildings and facilities used for the general conduct of government (e.g., city halls, courthouses, and emergency operation centers) are ineligible for funding.

ix. By law, (codified in the HCD Act as a note to 105(a)), the amount of CDBG-MIT funds that may be contributed to a USACE project is $250,000 or less.

x. Section 582 of the National Flood Insurance Reform Act of 1994, as amended, (42 U.S.C. 5154a) prohibits flood disaster assistance in certain circumstances. In general, it provides that no federal disaster relief assistance made available in a flood disaster area may be used to make a payment (including any loan assistance payment) to a person for ‘‘repair, replacement, or restoration’’ for damage to any personal, residential, or commercial property if that person at any time has received federal flood disaster assistance that was conditioned on the person first having obtained flood insurance under applicable federal law and the person has subsequently failed to obtain and maintain flood insurance as required under applicable federal law on such property. No disaster assistance may be provided for the repair, replacement, or restoration of a property to a person who has failed to meet this requirement.

xi. If the property is purchased through the use of eminent domain, the ultimate use of that property may not benefit a particular private party and must be for a public use; eminent domain can be used for public use, but public use shall not be construed to include economic development that primarily benefits private entities.

4.4.6.7 *Project Eligibility:*

i. Be a Tier 1 project identified in the 2019 Texas Coastal Resiliency Master Plan;

ii. Meet the definition of mitigation activities;

iii. Address identified current and future risks;

iv. CDBG-eligible activities under title I of HCDA or otherwise pursuant to a waiver or alternative requirement;

v. Meet a national objective;

vi. Includes a plan for the long-term funding and management of the operations and maintenance of the project; and

vii. Cost verification controls must be in place to assure that construction costs are reasonable and consistent with market costs at the time and place of construction.

4.4.6.8 *Selection Criteria:*

i. Meet the eligibility criteria;

ii. Prioritize projects that meet the LMI national objective;

iii. Prioritize projects in HUD MID counties and ZIP codes; and

iv. Prioritize projects that address the protection of FEMA lifelines.

4.4.6.9 *National Objectives:* LMI and UNM; at least fifty (50) percent of funds must benefit LMI persons.

4.4.6.10 *AFFH Review:*

All proposed projects will undergo AFFH review by the GLO before approval. Such review will include assessments of (1) a proposed project's area demography, (2) socioeconomic characteristics, (3) housing configuration and needs, (4) educational, transportation, and health care opportunities, (5) environmental hazards or concerns, and (6) all other factors material to the AFFH determination. Applications should show that projects are likely to lessen area racial, ethnic, and low-income concentrations, and/or promote affordable housing in low-poverty, nonminority areas in response to natural hazard-related impacts.

4.4.6.11 *Timeline:*

The proposed program start date is immediately after HUD's approval of this Action Plan. The proposed end date is 5 years from the start date of the program.

4.4.7 HOUSING OVERSUBSCRIPTION SUPPLEMENTAL

The Hurricane Harvey Homeowner Assistance Program (HAP) is a state-run housing program administered under the State of Texas Plan for Disaster Recovery: Hurricane Harvey for $5.676 billion in CDBG-DR funding. For additional details of this housing recovery program, please refer to the state action plan on the GLO's recovery website. Homeowners located within the city of Houston and Harris County remain ineligible for participation in the state-run HAP.

At present, the HAP program is oversubscribed, with the number of HAP applications for assistance exceeding the available program funds needed to move forward with reconstruction of damaged homes. Consequently, HAP applicants eligible for assistance are being waitlisted until further funding becomes available. To remedy HAP fund deficiencies so that waitlisted homeowners may continue in the state's recovery process, additional CDBG-MIT funding is being allocated.

4.4.7.1 *Connection to Identified Risk:*

As outlined in Mitigation Needs Assessment, hurricanes/tropical storms/tropical depressions, and severe coastal/riverine flooding are the top two severe risks to which Texas has the greatest exposure.

HAP is a housing recovery action with consequential mitigation benefit: more resilient residents and homes make for a more resilient community against the inevitable next hurricane or flooding event. As recently demonstrated in Tropical Storm Imelda, homes built and elevated under the GLO HAP program were able to withstand floodwaters that inundated communities. It is imperative that qualifying homeowners for HAP receive recovery assistance so that residential resilience is aggregated with other mitigation actions that local, county, and regional stakeholders undertake with CDBG-MIT funds, together with other funds, to form a comprehensive mitigation effort.

These CDBG-MIT funds will assist homeowners requiring elevation or storm hardening. For homes located inside the floodplain, the GLO elevates the lowest floor, including the basement, at least 2 feet above the base flood elevation or the high-water mark, whichever is higher. For homes located outside the designated floodplain, the GLO elevates homes at least 2 feet above the high-water mark. Additionally, the GLO will assist homes located in windstorm areas by ensuring the properties meet windstorm building code requirements.

Additional resilience and mitigation measures for Harvey damaged homes include International Residential Code 2012 (with windstorm provisions), green building standards and Resilient Home Construction Standards.

4.4.7.2 *Allocation Amount:* $400,000,000

i. Based on demand, priority will be given to Hurricane Harvey HUD MID areas with a goal of at least eighty (80) percent of funds going towards those areas.

ii. Up to twenty (20) percent of funds may address unmet need and identified risks in the Hurricane Harvey impacted counties minus their "most impacted" ZIP codes.

4.4.7.3 *Maximum assistance:*

i. Reconstruction with or without elevation: Local composite builder bid amount based on procured builders and the builder's house plans based on household size.

ii. Elevation costs caps at $60,000 for elevation of single family homes in coastal counties, and $35,000 for non-coastal counties. Elevation costs caps at $60,000 for elevation of single family homes in coastal counties, and $35,000 for non-coastal counties. The GLO may re-evaluate its elevation costs caps during the implementation based on average costs associated with elevating single family homes and on a case-by-case basis as needed. The GLO may re-evaluate its elevation costs caps during the implementation based on average costs associated with elevating single family homes and on a case-by-case basis as needed.

iii. Storm hardening and hazard mitigation related construction activities: Local composite builder bid amount based on procured builders and builder's house plans based on household size and other construction related expenses determined to be cost reasonable.

4.4.7.4 *Eligible Activities: Housing activities allowed under CDBG-MIT; HCDA Section 105(a)(1), 105(a) (3-4), 105(a)(8) 105(a)(11), 105(a)(18), and 105(a)(25), include but are not limited to:*

i. Single family owner-occupied reconstruction;

ii. Hazard mitigation;

iii. Elevation;

iv. Relocation Assistance;

v. Public service within the 15 percent cap (e.g., housing counseling, legal counseling, job training, mental health, and general health services); and

vi. Other activities associated with the recovery of single family housing stock impacted.

4.4.7.5 *Ineligible Activities:*

i. Forced mortgage payoff;

ii. Incentive payments to households that move to disaster-impacted floodplains;

iii. Properties that served as second homes at the time of the disaster, or following the disaster, are not eligible for rehabilitation assistance or housing incentives;

iv. Rehabilitation/reconstruction of homes located in the floodway;

v. Rehabilitation/reconstruction of a house in which the three below criteria are met:

vi. The combined household income is greater than 120 percent AMI or the national median;

vii. The property was located in a floodplain at the time of the disaster; and

viii. The property owner did not maintain flood insurance on the damaged property, even when the property owner was not required to obtain and maintain such insurance.

ix. Section 582 of the National Flood Insurance Reform Act of 1994, as amended, (42 U.S.C. 5154a) states that no federal disaster relief assistance made available in a flood disaster area may be used to make a payment (including any loan assistance payment) to a person for ‘‘repair, replacement, or restoration’’ for damage to any personal, residential, or commercial property if that person at any time has received federal flood disaster assistance that was conditional on the person first having obtained flood insurance under applicable federal law and the person has subsequently failed to obtain and maintain flood insurance as required under applicable federal law on such property. The program may not provide disaster assistance for the repair, replacement, or restoration of a property to a person who has failed to meet this requirement.

x. Homeowners located within the city limits of Houston and/or within Harris County are ineligible to participate in the state HAP. The city of Houston and Harris County are implementing their own programs.

4.4.7.6 *Eligibility Criteria for Assistance:*

i. Home must have been owner-occupied at the time of the storm and still owned by the owner at the time of the storm;

ii. Home must have served as primary residence;

iii. Home must be located in a Hurricane Harvey CDBG-DR eligible county;

iv. Home must have sustained damage from Hurricane Harvey;

v. Duplication of benefits review;

vi. Construction costs must be reasonable and consistent with market costs at the time and place of construction;

vii. All household members over the age of 18 must be current on payments for child support;

viii. Applicant must furnish evidence that property taxes are current, have an approved payment plan, or qualify for an exemption under current laws;

ix. Home must be environmentally cleared;

x. Property owners receiving disaster assistance that triggers the flood insurance purchase requirement have a statutory responsibility to notify any transferee of the requirement to obtain and maintain flood insurance in writing and to maintain such written notification in the documents evidencing the transfer of the property, and the transferring owner may be liable if he or she fails to do so;

xi. Subrogation Agreement: Assisted homeowners must agree to a limited subrogation of any future awards related to Hurricane Harvey to ensure duplication of benefits compliance. This is an agreement to repay any duplicative assistance if other disaster assistance for the same purpose later is received;

xii. Unsecured Forgivable Promissory Note;

xiii. Assisted homeowners are required to maintain principal residency in the assisted property for 3 years. Cash-out refinancing, home equity loans or any loans utilizing the assisted residence as collateral are not allowed for 3 years. A violation of this policy will activate the repayment terms of the Note;

xiv. Taxes are to be paid and in good standing for the properties assisted. Homeowners may be on a payment plan, but it needs to be submitted to the subrecipient or state as applicable; and

xv. Insurance must be maintained at the assisted property. Hazard, flood (if applicable), and windstorm (if applicable) will be monitored for the 3-year note period.

4.4.7.7 *National Objectives:* LMI and UNM. At least 70 percent of these program funds must be spent on LMI eligible projects.

4.4.7.8 *Housing Guidelines:*

The GLO will follow the housing guidelines that provide operational details on the eligibility requirements, housing assistance caps, construction standards, accessibility requirements, visitability standards, reporting requirements, and other program requirements. The housing guidelines were posted for public comment before adoption.

4.4.7.9 *Needs Assessment:*

The GLO conducted a local needs assessment. The local needs assessment and analysis of HUD/FEMA demographic IA data recommended the proportions of funding that should be set

aside to benefit each LMI and non-LMI economic group. The GLO in partnership with the University of Texas at Austin conducted a housing needs survey over the entire disaster impacted counties. The survey assessed remaining unmet housing needs resulting from Hurricane Harvey. The needs assessment determined the activities to be offered, the demographics to receive concentrated attention, identify disabled, "special needs," and vulnerable populations, and target areas to be served. The needs assessment also included an assessment of the types of public services activities that may be needed to complement the program, such as housing counseling, legal counseling, job training, mental health, and general health services. The needs assessment set goals within the income brackets similar to the housing damage sustained within the impacted areas. Deviations from goals will be evaluated by the GLO before the Program may move forward.

4.4.7.10 *Risk Assessment:*

HAP is a housing recovery action with consequential mitigation benefit: more resilient residents and homes make for a more resilient community against the inevitable next hurricane or flooding event. It is imperative that qualifying homeowners for HAP receive recovery assistance so that residential resilience is aggregated with other mitigation actions that local, county, and regional stakeholders, undertake with CDBG-MIT funds and other funds to form a comprehensive mitigation effort.

4.4.7.11 *Affirmative Marketing Outreach Plan:*

The GLO is committed to AFFH through established affirmative marketing policies. The GLO will continue to coordinate with HUD-certified housing counseling organizations in this effort. Affirmative marketing efforts are guided by an affirmative marketing plan, based on HUD regulations. The ongoing goal is to ensure that outreach and communication efforts reach eligible homeowners from all racial, ethnic, national origin, religious, familial status, the disabled, "special needs," gender groups, and vulnerable populations.

4.4.7.12 *AFFH Review:*

The program underwent AFFH review. Such review included assessments of (1) a proposed project's area demography, (2) socioeconomic characteristics, (3) housing configuration and needs, (4) educational, transportation, and health care opportunities, (5) environmental hazards or concerns, and (6) all other factors material to the AFFH determination. Applications should show that projects are likely to lessen area racial, ethnic, and low-income concentrations, and/or promote affordable housing in low-poverty, nonminority areas in response to natural hazard-related impacts.

4.4.7.13 *Timeline:*

The proposed program is a continuation of a current GLO program; accordingly, the start date is immediately after HUD's approval of this Action Plan. The proposed end date is 3 years from the start date of the program.

4.4.8 RESILIENT HOME PROGRAM

The Resilient Housing Program (RHP) will replace owner-occupied single family homes damaged by Hurricane Harvey with a reconstructed home that meets additional resiliency and mitigation standards required of the RHP. In addition to providing housing for those whose homes were seriously damaged during Hurricane Harvey, this program will serve as a showcase for more resilient residential construction practices and provide the opportunity to disseminate these practices through the residential construction industry on a scale larger than previously attempted.

The RHP will be run through the GLO as a sub-category of its HAP program. Eligible participants will be drawn from the GLO's existing waiting list of eligible HAP applicants. The GLO may directly administer this program in these areas or use the support of outside parties to serve homeowner assistance needs.

Currently, the number of HAP applications for assistance exceeds the available program funds needed to move forward with reconstruction of damaged homes. Consequently, HAP applicants eligible for assistance are waitlisted until further funding becomes available. To remedy HAP fund deficiencies so that waitlisted homeowners may continue in the state's recovery process, additional CDBG-MIT funding is being allocated through both the HAP Supplemental Program and the RHP. Homeowners located within the city of Houston and Harris County remain ineligible for participation in the state-run HAP.

4.4.8.1 *Connection to Identified Risk:*

As outlined in Mitigation Needs Assessment, hurricanes/tropical storms/tropical depressions, and severe coastal/riverine flooding are the top two severe risks to which Texas has the greatest exposure.

The RHP will serve a two-fold function: (1) providing high quality, durable, sustainable, and mold-resistant housing to those impacted by Hurricane Harvey; and (2) demonstrating the cost effectiveness of enhanced resiliency features in residential construction on a large scale to protect against the inevitable next storm or flooding event. By building homes to a higher standard than conventional construction practices on the scale proposed by this program, the RHP will bring those more resilient building practices into the mainstream where they can scale-up and become cost-competitive with conventional building practices.

4.4.8.2 *Allocation Amount:* $100,000,000

i. Based on demand, priority will be given to Hurricane Harvey HUD MID areas with a goal of at least eighty (80) percent of funds going towards those areas.

ii. Up to twenty (20) percent of funds may address unmet need and identified risks in the Hurricane Harvey impacted counties minus their "most-impacted" ZIP codes.

4.4.8.3 *RHP Home Construction Requirements:*

Requirements will be based on GLO resiliency standards, to be promulgated through a competitive procurement process to identify qualified home builders.

4.4.8.4 *Maximum assistance:*

i. Reconstruction with or without elevation: Local composite builder bid amount based on procured builders and the builder's house plans based on household size.

ii. Elevation costs caps at $60,000 for elevation of single family homes in coastal counties, and $35,000 for non-coastal counties. The GLO may re-evaluate its elevation costs caps during the implementation based on average costs associated with elevating single family homes and on a case-by-case basis as needed.

iii. Storm hardening and hazard mitigation related construction activities: Local composite builder bid amount based on procured builders and builder's house plans based on household size and other construction related expenses determined to be cost reasonable.

4.4.8.5 *Eligible Activities: Housing activities allowed under CDBG-MIT; HCDA Section 105(a)(1), 105(a) (3-4), 105(a)(8) 105(a)(11), 105(a)(18), and 105(a)(25), include but are not limited to:*

i. Single family owner-occupied reconstruction;

ii. Hazard mitigation;

iii. Elevation;

iv. Relocation Assistance;

v. Public service within the 15 percent cap (e.g., housing counseling, legal counseling, job training, mental health, and general health services); and

vi. Other activities associated with the recovery of single family housing stock impacted.

4.4.8.6 *Ineligible Activities:*

i. Forced mortgage payoff;

ii. Incentive payments to households that move to disaster-impacted floodplains;

iii. Properties that served as second homes at the time of the disaster, or following the disaster, are not eligible for rehabilitation assistance or housing incentives;

iv. Rehabilitation/reconstruction of homes located in the floodway;

v. Rehabilitation/reconstruction of a house in which the three below criteria are met:

vi. The combined household income is greater than 120 percent AMI or the national median;

vii. The property was located in a floodplain at the time of the disaster; and

viii. The property owner did not maintain flood insurance on the damaged property, even when the property owner was not required to obtain and maintain such insurance.

ix. Section 582 of the National Flood Insurance Reform Act of 1994, as amended, (42 U.S.C. 5154a) states that no federal disaster relief assistance made available in a flood disaster area may be used to make a payment (including any loan assistance payment) to a person for ‘‘repair, replacement, or restoration’’ for damage to any personal, residential, or commercial property if that person at any time has received federal flood disaster assistance that was conditional on the person first having obtained flood insurance under applicable federal law and the person has subsequently failed to obtain and maintain flood insurance as required under applicable federal law on such property. The program may not provide disaster assistance for the repair, replacement, or restoration of a property to a person who has failed to meet this requirement;

x. Emergency response services. Emergency response services shall mean those services that are carried out in the immediate response to a disaster or other emergency in order to limit the loss of life and damage to assets by state and local governmental and nongovernmental emergency public safety, fire, law enforcement, emergency response, emergency medical (including hospital emergency facilities), and related personnel, agencies, and authorities; and

xi. Homeowners located within the city limits of Houston and/or within Harris County are ineligible.

4.4.8.7 *Eligibility Criteria for Assistance:*

i. Home must have been owner-occupied at the time of the storm and still owned by the owner at the time of the storm;

ii. Home must have served as primary residence;

iii. Home must be located in a Hurricane Harvey CDBG-DR eligible county;

iv. Home must have sustained damage from Hurricane Harvey;

v. Duplication of benefits review;

vi. Construction costs must be reasonable and consistent with market costs at the time and place of construction;

vii. All household members over the age of 18 must be current on payments for child support;

viii. Applicant must furnish evidence that property taxes are current, have an approved payment plan, or qualify for an exemption under current laws;

ix. Home must be environmentally cleared;

x. Property owners receiving disaster assistance that triggers the flood insurance purchase requirement have a statutory responsibility to notify any transferee of the requirement to obtain and maintain flood insurance in writing and to maintain such written notification in the documents evidencing the transfer of the property, and the transferring owner may be liable if he or she fails to do so;

xi. Subrogation Agreement: Assisted homeowners must agree to a limited subrogation of any future awards related to Hurricane Harvey to ensure duplication of benefits compliance. This is an agreement to repay any duplicative assistance if other disaster assistance for the same purpose later is received;

xii. Unsecured Forgivable Promissory Note;

xiii. Assisted homeowners are required to maintain principal residency in the assisted property for 3 years. Cash-out refinancing, home equity loans or any loans utilizing the assisted residence as collateral are not allowed for 3 years. A violation of this policy will activate the repayment terms of the Note;

xiv. Taxes are to be paid and in good standing for the properties assisted. Homeowners may be on a payment plan, but it needs to be submitted to the subrecipient or state as applicable; and

xv. Insurance must be maintained at the assisted property. Hazard, flood (if applicable), and windstorm (if applicable) will be monitored for the 3-year note period.

4.4.8.8 *National Objectives*: LMI and urgent need. At least 70 percent of these program funds must be spent on LMI-eligible projects.

4.4.8.9 *Housing Guidelines:*

The GLO will follow the housing guidelines that provide operational details on the eligibility requirements, housing assistance caps, construction standards, accessibility requirements, visitability standards, reporting requirements, and other program requirements. The housing guidelines were posted for public comment before adoption.

4.4.8.10 *Needs Assessment:*

The GLO conducted a local needs assessment. The local needs assessment and analysis of HUD/FEMA demographic IA data recommended the proportions of funding that should be set

aside to benefit each LMI and non-LMI economic group. The GLO, in partnership with the University of Texas at Austin, conducted a housing needs survey over the entire disaster impacted counties. The survey assessed remaining unmet housing needs resulting from Hurricane Harvey. The needs assessment determined the activities to be offered, the demographics to receive concentrated attention, identified disabled, "special needs," and vulnerable populations, and target areas to be served. The needs assessment also included an assessment of the types of public services activities that may be needed to complement the program such as housing counseling, legal counseling, job training, mental health, and general health services. The needs assessment set goals within the income brackets similar to the housing damage sustained within the impacted areas. Deviations from goals will be evaluated by the GLO before the Program may move forward.

4.4.8.11 *Risk Assessment:*

HAP is a housing recovery action with consequential mitigation benefit: more resilient residents and homes make for a more resilient community against the inevitable next hurricane or flooding event. It is imperative that qualifying homeowners for HAP receive recovery assistance so that residential resilience is aggregated with other mitigation actions that local, county, and regional stakeholders, undertake with CDBG-MIT funds and other funds to form a comprehensive mitigation effort. By building homes to a higher standard than conventional construction practices on the scale proposed by this program, the RHP will bring those more resilient building practices into the mainstream where they can scale-up and become cost-competitive with conventional building practices.

4.4.8.12 *Affirmative Marketing Outreach Plan:*

The GLO is committed to AFFH through established affirmative marketing policies. The GLO will continue to coordinate with HUD-certified housing counseling organizations in this effort. Affirmative marketing efforts are guided by an affirmative marketing plan, based on HUD regulations. The ongoing goal is to ensure that outreach and communication efforts reach eligible homeowners from all racial, ethnic, national origin, religious, familial status, the disabled, "special needs," gender groups, and vulnerable populations.

4.4.8.13 *AFFH Review:*

The program underwent AFFH review. Such review included assessments of (1) a proposed project's area demography, (2) socioeconomic characteristics, (3) housing configuration and needs, (4) educational, transportation, and health care opportunities, (5) environmental hazards or concerns, and (6) all other factors material to the AFFH determination. Applications should show that projects are likely to lessen area racial, ethnic, and low-income concentrations, and/or promote affordable housing in low-poverty, nonminority areas in response to natural hazard-related impacts.

4.4.8.14 *Timeline:*

The proposed program start date is immediately after HUD's approval of this Action Plan. The proposed end date is 6 years from the start date of the program.

4.4.9 HAZARD MITIGATION PLANS

The GLO is partnering with the Texas Division of Emergency Management (TDEM) to provide CDBG-MIT funds for the development of an enhanced State of Texas Hazard Mitigation Plan (enhanced SHMP), as well as providing funds for the development of Local Hazard Mitigation Plans (LHMP) for eligible areas.

A FEMA-approved enhanced state mitigation plan documents a state's ongoing commitment to hazard mitigation, the ongoing proactive efforts to implement a comprehensive hazard mitigation program across the state, and the coordinated effort of the state to reduce losses, protect life and property, and create safer communities. Approval of an enhanced state mitigation plan makes a state eligible for assistance up to 20 percent for estimated aggregate amounts of a disaster, compared with 15 percent for states without an enhanced plan. The enhanced SHMP will be developed and maintained by TDEM's Hazard Mitigation Section. CDBG-MIT funds may be leveraged with TDEM funds provided by FEMA.

The enhanced state hazard mitigation plan should serve as the framework for the local hazard mitigation plans within that state. The purpose of these plans is to gather a wide range of stakeholders and the public in a planning process to identify local policies and actions—based on an assessment of hazards, vulnerabilities, and risks—that can be implemented over the long-term to reduce risk and future losses from hazards. By engaging in this planning process, communities not only identify risks and prioritize investments and interventions, but also build partnerships by involving citizens, organizations, and businesses, and increase awareness of threats and hazards, as well as their risks.

4.4.9.1 *Connection to Identified Risk:*

Through the creation and adoption of an enhanced SHMP and LHMPs, the state and its units of local government will communicate priorities to both state and federal officials while aligning risk reduction strategies across jurisdictions with community objectives.

4.4.9.2 *Allocation Amount:* $30,000,0000

4.4.9.3 *Maximum Award Amount:* $100,000 for LHMPs.

4.4.9.4 *Eligible Entities:* TDEM, FEMA HMGP eligible entities located within any CDBG-MIT county.

4.4.9.5 *Eligible Activities:*

i. Development of the enhanced SHMP;

ii. Development or update of an LHMP, including studies to enhance a community's understanding of risk (examples: dam inundation studies, flood studies, wildfire studies); and

iii. Cost Share.

4.4.9.6 *Ineligible Activities:*

Those activities not expressly identified under Eligible Activities

4.4.9.7 *Program Requirements:*

i. LHMPs must meet all criteria and requirements of 44 CFR 201.6 and must be approved by TDEM and FEMA.

ii. Applicants that receive funding and adopt approved LHMPs may apply again to this program in the two years prior to the expiration of the LHMP, provided the application is made within the timeline outlined below and funds remain.

4.4.9.8 *Timeline:*

Because local hazard mitigation plans operate on a 5-year cycle, the application period will remain open for six (6) years, with a proposed start date six (6) months after HUD's approval of this Action Plan and until funds are exhausted.

4.4.10 Resilient Communities Program

The GLO supports the adoption of policies that both reflect local and regional priorities and will have long-lasting effects on community risk reduction. Accordingly, the Resilient Communities Program will fund the development, adoption, and implementation of modern and resilient building codes and flood damage prevention ordinances to ensure that structures built within the community can withstand future hazards.

Building codes are the primary mechanism for communities to regulate the design and construction of new buildings and the renovation of existing buildings. At a minimum, codes reflect a community's accepted requirements for ensuring the safety of a building occupants and people in proximity to buildings. Many communities rely on model building codes as the basis for their locally adopted code. These model building codes are developed through a national consensus process to efficiently leverage national experts, respond to the latest research findings, identify and incorporate new technology and processes, and support economies of scale.

Flood damage prevention ordinances provide the framework regulating what can be built in a floodplain, limited changes to the flows of waterways, and ensuring buildings are constructed at or above the base flood elevation. Adoption of a flood damage prevention ordinance, or some equivalent enforcement mechanism, is required for participation in FEMA's National Flood Insurance Program (NFIP). Adoption of higher regulatory standards—for instance, mandating construction at 2 feet or greater above base flood elevation—can make a community eligible to participate in the NFIP Community Rating System (CRS), which can reduce the flood insurance premiums for a community's property owners.

Land use and comprehensive plans, along with the zoning codes that often accompany them, take community goals and aspirations and formalize them into actionable policies that determine what can be built within a certain jurisdiction and where it can be built. Land use and comprehensive plans themselves serve as guiding documents that provide the framework by which regulatory structures are created—by themselves these plans have regulatory authority. Zoning codes take the ideas outlined in the land use and comprehensive plans and formalize those ideas into legally binding ordinances that ultimately shape how and where a community develops. Creating land use and comprehensive plans that incorporate hazard mitigation considerations within their framework helps cities and towns to develop in a manner that reduces the risk to future hazards.

Applicants may submit applications for any eligible activity for which they are an eligible applicant (e.g. a county may apply to update or adopt a new building code but may not apply to create and adopt a zoning code). The applicant is NOT required to engage in all eligible activities—only those activities the applicant is interested in pursuing. The GLO may use the adoption of codes, ordinances, and/or plans in this program as scoring criteria in other CDBG-MIT programs.

4.4.10.1 *Connection to Identified Risk:* This program encourages communities to look at all their identified risks in a comprehensive manner and integrate mitigation measures in each activity they undertake.

4.4.10.2 *Allocation Amount*: $100,000,000

4.4.10.3 *Maximum Award Amount:* $300,000 per applicant

4.4.10.4 *Eligible Entities:*

i. Units of local government (cities and counties), Indian Tribes, and councils of governments located within a CDBG-MIT eligible area.

4.4.10.5 *Eligible Activities:*

i. Development, adoption, and implementation of Building Codes that meet or exceed the standards set forth in the International Residential Code 2012 (IRC 2012);

ii. Development, adoption, and implementation of a Flood Damage Prevention Ordinance that meets CDBG-MIT requirements of at least 2 feet above base flood elevation;

iii. Development, adoption, and implementation of a Zoning Ordinance based upon a land use plan or comprehensive plan;

iv. Development and adoption of forward-looking land use plans that integrate hazard mitigation plans;

v. Development and adoption of forward-looking Comprehensive Plans that integrate hazard mitigation plans; or

vi. Public Service activities focused on education and outreach campaigns designed to alert communities and beneficiaries to opportunities to further mitigate identified risks through insurance, best practices, and other strategies. Public information activities leading to CRS credit accrual and CRS eligibility are eligible under this activity.

4.4.10.6 *Ineligible Activities:*

i. Activities not expressly listed under the Eligible Activities section are prohibited.

4.4.10.7 *Program Requirements:*

i. Building Codes:

ii. Adopted building code must meet or exceed IRC 2012.

iii. Adoption of selected building code must be complete within 12 months of grant award. Failure to adopt within that timeframe will result in the forfeiture of grant funds and repayment.

iv. Flood Damage Prevention Ordinance:

v. Adopted ordinance must meet CDBG-MIT requirements of at least two feet above base flood elevation.

vi. Adoption of flood damage prevention ordinance must be complete within 12 months of grant award. Failure to adopt within that timeframe will result in the forfeiture of grant funds and repayment.

vii. Zoning Ordinance:

viii. Adopted ordinance must be based on an adopted Land Use or Comprehensive Plan that was written within the last five (5) years of the date of application for this program.

ix. Adoption of approved zoning ordinance must be complete within 12 months of grant award. Failure to adopt within that timeframe will result in the forfeiture of grant funds and repayment.

x. Land Use Plans:

xi. Land use plans must be forward-looking and integrate the relevant portions of the local hazard mitigation plan, if one exists.

xii. Land use plans must identify local hazard risks and explain how the plan mitigates against those risks.

xiii. Land use plans must be accompanied by a zoning ordinance that codifies the land use plan.

xiv. Adoption of an approved Land Use Plan and Zoning Ordinance must be complete within 18 months of grant award. Failure to adopt within that timeframe will result in the forfeiture of grant funds.

xv. Comprehensive Plans:

xvi. Adopted Comprehensive Plans must include: (1) a Population Study that provides a population estimate and population projection for the next 20 years; (2) a Housing Study that describes the composition of the existing housing stock, including total number of units, number of single family and multifamily units, and vacancy rates, as well as a projection for the number of future housing units needed ten (10) years from the date of the plan and the composition of those units (e.g., single family, multifamily); (3) a Land Use Study/Plan that describes the land use of every parcel within the jurisdiction and includes a future land use map that accounts for future population changes; (4) a Zoning Ordinance that codifies the Land Use Plan; and

(5) an Infrastructure Study and Capital Improvement Plan that describes the water, wastewater, drainage, and streets systems, including length, width, materials, and condition or age (if available), as well as proposed prioritized improvements to those systems.

xvii. Plan must identify local hazard risks and explain how the plan mitigates against those risks.

xviii. Adoption of approved Comprehensive Plan and Zoning Ordinance must be complete within 24 months of grant award. Failure to adopt within that timeframe will result in the forfeiture of grant funds and repayment.

xix. Public service activities:

xx. Must be focused on education and outreach campaigns designed to alert communities and beneficiaries to opportunities to further mitigate identified risks through insurance, best practices and other strategies; and

xxi. Public information activities conducted with the intent of earning CRS credits must meet the requirements for those activities within the CRS Coordinator's Manual.[446]

4.4.10.8 *Eligibility/Selection Criteria:*

i. Applicant/beneficiary must be located within a CDBG-MIT county;

ii. Applicant must be a unit of local government, Indian tribe, or any other entity that has the legal authority to adopt and enforce the code, ordinance, or plan for which funding was requested (i.e., most counties do not have the authority to adopt or enforce zoning ordinances);

iii. Applicants must demonstrate the capacity to administer grant funds and complete the selected project on time or describe how they will procure assistance to do so;

iv. Applicants must list and describe existing building codes, ordinances, and local and/or regional plans (if applicable)—including county or regional level hazard mitigation plans—and how those existing regulations and planning efforts will inform the project for which funding was requested; and

v. Applications will be processed on a first-come, first-served basis.

4.4.10.9 *Activities should:*

i. Promote sound, sustainable long-term mitigation planning informed by a post-disaster evaluation of hazard risk, especially land-use decisions that reflect

[446] *Coordinator's Manual*, National Flood Insurance Program Community Rating System, FIA-15/2017, FEMA, https://www.fema.gov/media-library-data/1493905477815-d794671adeed5beab6a6304d8ba0b207/633300_2017_CRS_Coordinators_Manual_508.pdf

responsible floodplain management and take into account future possible extreme weather events and other natural hazards and long-term risks;

ii. Coordinate with local and regional planning efforts to ensure consistency, and promote community-level and/or regional (e.g., multiple local jurisdictions) mitigation planning;

iii. Integrate mitigation measures into all activities and achieve objectives outlined in regionally or locally established plans and policies that are designed to reduce future risk to the jurisdiction; and

iv. Result in buildings that are more resilient to the impacts of natural hazards.

4.4.10.10 *AFFH Review:*

All proposed activities will undergo AFFH review by the GLO before approval. Such review will include assessments of (1) area demography, (2) socioeconomic characteristics, (3) housing configuration and needs, (4) educational, transportation, and health care opportunities, (5) environmental hazards or concerns, and (6) all other factors material to the AFFH determination. Applications should show that activities are likely to lessen area racial, ethnic, and low-income concentrations, and/or promote affordable housing in low-poverty, nonminority areas in response to natural hazard-related impacts.

4.4.10.11 *Timeline*

The proposed program start date is six (6) months after HUD's approval of this Action Plan. The proposed end date is six (6) years from the start date of the program.

4.4.11 Regional and State Planning

The GLO is committed to the purposes of planning in the areas that are eligible for CDBG-MIT funds, and to the completion of some of the projects identified as a result of the studies. Because of the vast scope of the eligible area and the recurring nature of disasters throughout the state, the GLO may concentrate on regional approaches in addition to specific local solutions to promote sound mitigation practices. In order to provide an efficient and effective method of selecting and executing planning studies, the GLO will work with Texas universities, state agencies, federal agencies, regional planning and oversight groups—including councils of governments, river authorities, and drainage districts—and/or vendors (terms which shall include, but not limited to other governmental entities, and non-profit and for profit firms, entities, and organizations) to conduct studies with CDBG-MIT funds. The GLO has previously utilized a local community input process that included public meetings, requests for information, listening sessions, and written surveys that helped determine the specific needs for planning studies. This process pointed to the need for more regional-based planning studies.

For the CDBG-MIT funds, the GLO will utilize similar input methods to identify current study needs. Accordingly, opportunities for regionalized studies will be prioritized and the GLO will identify qualified experts for specific tasks identified. Studies may include, but are not limited to, flood control, drainage improvement, resilient housing solutions, homelessness, surge protection, economic development, infrastructure improvement or other efforts to mitigate risks and future damages and establish plans for comprehensive recovery efforts. Communities may recommend studies to be completed, but all planning funds will be administered by the GLO. The GLO will make all final determinations regarding planning studies and coordinate with Texas universities, state agencies, federal agencies, and/or vendors to identify scopes, the parameters of the planning efforts, and the type of data that they will gather. This approach will ensure planning studies that are conducted in different regions can be consolidated and analyzed, and that consistency and accuracy in data gathering is achieved. Further amendments may convert a portion of these planning funds to execute specific projects contemplated or developed through the planning process.

The state is working to develop and maintain a secure database system that documents the impacts of past disasters and provides analytical data assessing natural hazard risks, including anticipated effects of future extreme weather events and other natural hazards. This will enable the state to improve its disaster information, analytics capabilities, and foster communication, collaboration, and information gathering among relevant state agencies that have a role in disaster response and recovery. Additionally, the data gathered will inform both the state and local communities of possible solutions that plan for and create a more resilient landscape in the state of Texas.

The state is also working with key federal agencies to develop more accurate flood mapping and modeling techniques. The current mapping and modeling techniques are insufficient to conduct a

detailed cost-benefit analysis of mitigation proposals. The state will work jointly with federal partners to develop the necessary technology and models to more accurately predict and mitigate future damages.

The GLO may develop a planning competition that entities in CDBG-MIT counties may apply for in a future action plan amendment or move funds to other mitigation eligible uses as need dictates.

The requirements at 24 CFR 570.483(b)(5) or (c)(3), which limit the circumstances under which the planning activity can meet a low- and moderate-income national objective, will not apply to CDBG-MIT planning activities; instead, the state will comply with 24 CFR 570.208(d)(4) when funding mitigation, planning-only grants, or directly administering planning activities that guide mitigation in accordance with the Appropriations Act. In addition, the types of planning activities the state may fund or undertake will be consistent with those of entitlement communities identified at 24 CFR 570.205, which may include support for local and regional functional land use plans, master plans, historic preservation plans, comprehensive plans, community recovery plans, resilience plans, development of building codes, zoning ordinances, and neighborhood plans.

4.4.11.1 *Allocation Amount:* $214,859,450

4.4.11.2 *Eligible Activities: Planning activities allowed under CDBG-MIT; HCDA section 105(a)(12)*

i. Eligible planning, urban environmental design, and policy-planning-management-capacity building activities as listed in 24 CFR 570.205.

4.4.11.3 *Ineligible Activities:*

i. Activities not listed in 24 CFR 570.205, HCDA 105(a)(12).

4.4.11.4 *Activities should:*

i. Promote sound, sustainable mitigation planning informed by an evaluation of hazard risk, especially land-use decisions that reflect responsible floodplain management and take into account future possible extreme weather events and other natural hazards and long-term risks;

ii. Coordinate with local and regional planning efforts to ensure consistency, and promote community-level and/or regional (e.g., multiple local jurisdictions) post-disaster recovery and mitigation planning;

iii. Integrate mitigation measures into rebuilding activities and achieve objectives outlined in regionally or locally established plans and policies that are designed to reduce future risk to the jurisdiction;

iv. Consider the costs and benefits of the project;

v. Ensure that activities will avoid disproportionate impact on vulnerable populations such as, but not limited to, families and individuals that are homeless or at risk of homelessness, the elderly, persons with disabilities, persons with alcohol or other drug addiction, persons with HIV/AIDS and their families, and public housing residents.

vi. Ensure that activities create opportunities to address economic inequities facing local communities;

vii. Align investments with other planned state or local capital improvements and infrastructure development efforts, and work to foster the potential for additional infrastructure funding from multiple sources, including existing state and local capital improvement projects in planning, and potential private investment; and

viii. Employ adaptable and reliable technologies to guard against premature obsolescence of infrastructure.

4.4.11.5 *Timeline*

The proposed program start date is immediately after HUD's approval of this Action Plan. The proposed end date is twelve (12) years from the start date of the program.

4.4.12 Administrative Funds

State administrative costs including subrecipient administration costs will not exceed five (5) percent, $214,859,450. Planning and administrative costs combined will not exceed 20 percent. The provisions outlined under 42 U.S.C. 5306(d) and 24 CFR 570.489(a)(1)(i) and (iii) will not apply to the extent that they cap state administration expenditures and require a dollar-for-dollar match of state funds for administrative costs exceeding $100,000. Additionally, the provisions outlined under 42 U.S.C. 5306(d)(5) and (6) will not apply; instead, the aggregate total for administrative and technical assistance expenditures will not exceed 5 percent of the grant amount plus 5 percent of program income generated by the grant. The state will limit its spending to a maximum of 15 percent of its total grant amount on planning costs.

The GLO will retain the full 5 percent allocated for administrative costs associated with the CDBG-MIT allocation for purposes of oversight, management, and reporting. All subrecipients are allowed to spend up to 12 percent of program amounts for costs directly related to implementation of housing-related mitigation activities. For costs directly related to implementation of all other mitigation activities all subrecipients are allowed to spend up to 8 percent for awards from $1 million to $24,999,999.99, and 6 percent for awards over $25 million. For mitigation awards less than $1 million, refer to guidance found on the GLO's recovery website, http://recovery.texas.gov/. Engineering and design activities will be capped at 15 percent of the

total project award unless special services are necessary; in such cases, the GLO must review and approve the request.

The GLO will use administrative funds across the 2015 Floods, 2016 Floods, and Hurricane Harvey CDBG-DR grants, together with this CDBG-MIT grant, without regard for a particular disaster appropriation from which the funds originated. The amount of grant administration expenditures for each of the aforementioned grants will not exceed 5 percent of the total grant award for each grant (plus 5 percent of program income).

4.5 Location

All CDBG-MIT funded activities under this Action Plan will occur within the disaster-declared counties of FEMA DR-4223 and DR-4245 (2015 Floods); DR-4266, DR-4269, DR-4272 (2016 Floods); and DR-4332 (Hurricane Harvey). An aggregated list of the total 140 eligible counties for CDBG-MIT funds appears in the appendix.

Additional areas within counties not explicitly cited as eligible may also become locations of CDBG-MIT funded activities if it can be demonstrated how the expenditure of CDBG-MIT funds in that area will measurably mitigate risks identified within an eligible area (e.g., upstream water retention projects to reduce downstream flooding in an eligible area).

4.6 National Objectives

HUD has waived the criteria for the established CDBG urgent need national objective as provided at 24 CFR 570.208(c) and 24 CFR 570.483(d), and instead has created a new national objective: urgent need mitigation (UNM). For CDBG-MIT activities where UNM is cited as the national objective being fulfilled, the state will demonstrate that the activity:

i. Addresses the current and future risks as identified in the state's Mitigation Needs Assessment of most impacted and distressed areas; and

ii. Will result in a measurable and verifiable reduction in the risk of loss of life and property.

For CDBG-MIT activities, HUD has also directed grantees to not rely on the national objective criteria for elimination of slum and blighting conditions without approval from HUD, because this national objective generally is not appropriate in the context of mitigation activities.

All of the state's mitigation activities under this grant will meet a national objective for either (1) urgent need mitigation (UNM), or (2) benefitting low- to moderate-income persons (LMI). At least 50 percent of CDBG-MIT funds will be used to support activities that benefit LMI persons, and all programs and projects will have an LMI priority.

5 CITIZEN PARTICIPATION – STATE MITIGATION ACTION PLAN

The primary goal of this citizen participation plan is to stimulate more robust citizen involvement in the state's recovery and mitigation processes. The citizen participation plan was developed based on the requirements outlined in HUD's notice (the Notice) published in the Federal Register: 84 FR 45838 (Friday, August 30, 2019).

The Notice states:

> *"To permit a more robust process and ensure mitigation activities are developed through methods that allow all stakeholders to participate, and because citizens recovering from disasters are best suited to ensure that grantees will be advised of any missed opportunities and additional risks that need to be addressed, provisions of 42 U.S.C. 5304(a)(2) and (3), 42 U.S.C. 12707, 24 CFR 570.486, 24 § 91.105(b) and (c), and 24 CFR 91.115(b) and (c), with respect to citizen participation requirements, are waived and replaced by the requirements below. These revised requirements mandate public hearings (the number of which is based upon the amount of a grantee's CDBG-MIT allocation) across the HUD-identified MID areas and require the grantee to provide a reasonable opportunity (at least 45 days) for citizen comment and ongoing citizen access to information about the use of grant funds."*

The most current version of the citizen participation plan will be placed on the GLO's recovery website at recovery.texas.gov.

5.1 Public Hearings

The requirements for CDBG-MIT grantees mandate a minimum number of public hearings in the HUD-identified MID areas; for Texas, the minimum number is four. The GLO will hold a total of 6 public hearings in the HUD MID areas, three of which will be held prior to publication of the action plan for public comment on the GLO's website. All public hearings were held:

- In a different location to ensure geographic balance and maximum accessibility;
- In facilities that are physically accessible to persons with disabilities; and
- In compliance with civil rights requirements.

Archival recordings made during one or more of the hearings will be posted on the GLO's mitigation webpage(s) navigable from its recovery website.

Table 5-1: Mitigation Public Hearing Schedule

Public Hearing		Date	HUD/State MID County	Location
1	Pre-Action Plan Publication	September 26, 2019 at 12:00 p.m.	HUD MID County (Travis County)	Texas State Capitol Auditorium, E1.004 1100 Congress Avenue, Austin, Texas, 78701
2	Pre-Action Plan Publication	October 1, 2019 at 12:00 p.m.	HUD MID County (Jefferson County)	Jefferson County Courthouse 1149 Pearl Street Beaumont, Texas, 77701
3	Pre-Action Plan Publication	October 2, 2019 at 12:00 p.m.	HUD MID County (Nueces County)	Del Mar College Center for Economic Development, 106 3209 S. Staples Street Corpus Christi, Texas 78411
4	Public Comment Period	December 2, 2019 at 10 a.m.	HUD MID County (Aransas County)	Aransas County Navigation District Saltwater Pavilion 210 Seabreeze Drive Rockport, TX 78382
5	Public Comment Period	December 9, 2019 at 10 a.m.	State MID County (Dallas County)	Dallas County Community College District – Bill J Priest Institute 1402 Corinth Street Road Dallas, Texas 75215
6	Public Comment Period	December 10, 2019 at 10 a.m.	HUD MID County (Hidalgo County)	North Academic Building G Lecture Hall G191 Mid Valley Campus of South Texas College 400 N Border Ave. Weslaco, Texas 78596

7	Public Comment Period	December 11, 2019 at 6 p.m.	HUD MID County (Harris County)	Texas Southern University EDU Auditorium 3100 Cleburne Street Houston, Texas 77004
8	Public Comment Period	January 9, 2020 at 10:00 a.m.	HUD MID County (Jasper County)	Jasper County Courthouse Annex 271 East Lamar Jasper, TX 75951

5.2 Publication

Before the GLO adopts the Action Plan for this grant or any substantial amendment to the Plan, the GLO will publish the Action Plan or amendment on the GLO's recovery website: recovery.texas.gov. The topic of disaster mitigation will be navigable by citizens from the GLO's recovery website homepage.

The GLO and/or subrecipients will notify affected citizens of the published Action Plan or substantial amendment to the Action Plan through electronic mailings, press releases, statements by public officials, media advertisements, public service announcements, newsletters, contacts with neighborhood organizations, and/or through social media.

The GLO will ensure that all citizens have equal access to information about the Action Plan's programs, including persons with disabilities and limited English proficiency (LEP). The GLO will ensure that program information is available in the appropriate languages for the geographic area served by the jurisdiction. For assistance in ensuring that this information is available to LEP populations, recipients should consult the *Final Guidance to Federal Financial Assistance Recipients Regarding Title VI, Prohibition Against National Origin Discrimination Affecting Limited English Proficient Persons*, published on January 22, 2007, in the Federal Register (72 FR 2732).

The Action Plan in its entirety will be translated to Spanish, Vietnamese, Chinese, Korean, and Arabic. The languages selected were selected based on the entire CDBG-MIT eligible area (CDBG-DR declared counties for the 2015 Floods, the 2016 Floods, and Hurricane Harvey) and a natural break in the numbers of Limited English Proficiency individuals. Recognizing there may be a need for individuals to have access to the document in additional languages, the GLO will be contracting with a translation service to provide personalized translations of the Action Plan upon request. Any public places that work directly in Action Plan programs available to private individuals will carry signage detailing this service in applicable languages. The GLO website will include similar notations.

Subsequent to publication of the Action Plan, the GLO will provide a reasonable opportunity for public comment of at least 45 days and have a method(s) for receiving comments. For substantial amendments to the Action Plan, the GLO will provide a reasonable opportunity for public comment of at least 30 days and have a method(s) for receiving comments. Citizens with disabilities or those who need technical assistance can contact the GLO office for assistance, either via: TDD 512-463-5330 or TX Relay Service 7-1-1.

The GLO will take comments via USPS mail, fax, or email:

Mail: Texas General Land Office
Community Development and Revitalization
P.O. Box 12873
Austin, TX 78711-2873

Fax: (512) 475-5150

Email: cdr@recovery.texas.gov

Website: recovery.texas.gov

5.3 Consideration of Public Comments

The GLO will consider all oral and written comments regarding the Action Plan or any substantial amendment. A summary of the comments received and the GLO's response to each located in the Appendix will be submitted to HUD with the Action Plan or substantial amendment.

5.4 Citizen Advisory Committee

The GLO will form a citizen advisory committee (CAC) that will meet in an open forum twice a year in order to provide increased transparency of all CDBG-MIT fund activities. During each open forum, the CAC will solicit and respond to public comments regarding the GLO's mitigation activities in order to better inform the GLO's current and planned mitigation projects and programs.

5.5 Citizen Complaints

The GLO will provide a timely written response to every citizen complaint. The response will be provided within fifteen (15) working days of the receipt of the complaint, when practicable. Complaints regarding fraud, waste, or abuse of government funds should be forwarded to the HUD OIG Fraud Hotline (phone: 1-800-347-3735 or email: hotline@hudoig.gov).

5.6 Substantial Amendment

As additional information and funding becomes available through the grant administration process, amendments to this Action Plan are expected. Prior to adopting any substantial amendment to this Action Plan, the GLO will publish the proposed amendment on the GLO's recovery website and will afford citizens, affected local governments, and other interested parties a reasonable opportunity to examine the Action Plan or amendment's contents. At a minimum, the following modifications will constitute a substantial amendment:

i. The addition of a CDBG-MIT Covered Project;

ii. A change in program benefit or eligibility criteria;

iii. The addition or deletion of an activity; or

iv. The allocation or reallocation of more than $25 million or a change constituting more than 20% of a program's budget.

5.7 Non-substantial Amendment

The GLO will notify HUD when it makes any action plan amendment that is not substantial. HUD will be notified at least five (5) business days before the amendment becomes effective. HUD will acknowledge receipt of the notification of non-substantial amendments via email within five (5) business days. Once effective, the non-substantial amendment to the Plan will be posted on the GLO's recovery website.

5.8 Community Consultation

Since the April 2018 announcement of CDBG mitigation funding to Texas, the GLO began to think about its upcoming role in mitigation activities related to the 2015 and 2016 flood events, and Hurricane Harvey. The GLO began to elicit feedback from local officials and interested parties throughout the 140 counties located in 23 of the 24 councils of governments in the state, including meetings, conference calls, and regional trips to impacted communities. These trips have included stakeholder input sessions, where permissible, with seven of the nine COGs located in the Harvey most impacted and distressed areas.

On February 20, 2019 the GLO launched a digital survey through the service Survey Monkey to gauge the disaster recovery and mitigation needs of communities throughout the 140 eligible counties. Elected officials, representatives of local, regional, and state agencies, public housing representatives, private sector, and non-profits focused on housing, disaster recovery, and the needs of low-income and vulnerable populations were contacted and encouraged to complete the survey. The survey was also hosted on the GLO recovery website, recovery.texas.gov, and was included in a two-page brochure that GLO staff distributed at stakeholder input sessions, public workshops, and conferences.

The survey was closed on September 20, 2019, at which point the survey had 416 respondents from across the state. The results of the survey are located in the appendix.

A cumulative list of community consultation is in the appendix.

5.9 Public Website

The GLO will maintain a public website that provides information accounting for how all grant funds are used and managed/administered, including: (1) links to all action plans; (2) action plan amendments; (3) CDBG-DR and CDBG-MIT program policies and procedures; (4) performance

reports; (5) citizen participation requirements; and (6) activity/program information for activities described in the respective action plans, including details of all contracts and ongoing procurement policies.

The GLO will make the following items available on recovery.texas.gov: (1) the action plans (including all amendments); (2) each Quarterly Performance Report (QPR) as created using the DRGR system; (3) procurement, policies and procedures; (4) executed CDBG-DR and CDBG-MIT contracts; and (5) status of services or goods currently being procured by the GLO (e.g., phase of the procurement, requirements for proposals, etc.).

In addition to the specific items listed above, the GLO will maintain a comprehensive website, recovery.texas.gov, regarding all disaster recovery activities assisted with these funds. The website will be updated in a timely manner to reflect the most up-to-date information about the use of all CDBG-DR and CDBG-MIT funds and any changes in policies and procedures, as necessary. At a minimum, updates will be made on a monthly basis.

5.9.1 Councils of Governments Websites for Regional Mitigation Program MODs

i. Alamo Area Council of Governments (AACOG): www.aacog.com
ii. Brazos Valley Council of Governments (BVCOG): www.bvcog.org
iii. Capital Area Council of Governments (CAPCOG): www.capcog.org
iv. Coastal Bend Council of Governments (CBCOG): www.coastalbendcog.org
v. Central Texas Council of Governments (CTCOG): www.ctcog.org
vi. Deep East Texas Council of Governments (DETCOG): www.detcog.gov
vii. Golden Crescent Regional Planning Commission (GCRPC): www.gcrpc.org
viii. Houston-Galveston Area Council (H-GAC): www.h-gac.com
ix. South East Texas Regional Planning Commission (SETRPC): www.setrpc.org
x.

5.10 Application Status and Transparency

For applications received for CDBG-MIT assistance, the GLO will provide multiple methods of communication, including information posted on its website and a toll-free number to call to determine the status of their application for assistance.

In instances where the GLO seeks to competitively award CDBG-MIT funds, eligibility requirements will be published on the GLO's recovery website and, for CDBG-MIT funds, on the GLO's mitigation webpage(s) for such funding, together with all criteria to be used in the selection of applications for funding (including the relative importance of each criterion) and the time frame for consideration of applications. The GLO will maintain documentation to demonstrate that each funded and unfunded application was reviewed and acted upon in accordance with the published eligibility requirements and funding criteria cited in HUD's relevant notice published in the Federal Register.

5.11 Waivers

The Appropriations Act authorizes the Secretary to waive or specify alternative requirements for any provision of any statute or regulation that the Secretary administers in connection with the obligation by the Secretary, or use by the recipient, of these funds, except for requirements related to fair housing, nondiscrimination, labor standards, and the environment. HUD also has regulatory waiver authority under 24 CFR 5.110, 91.600, and 570.5.

Grantees may request additional waivers and alternative requirements from the Department as needed to address specific needs related to their mitigation activities. Grantee requests for waivers and alternative requirements must be accompanied by relevant data to support the request and must demonstrate to the satisfaction of the Department that there is good cause for the waiver or alternative requirement.

6 APPENDICES

6.1 Appendix A: CDBG-MIT Eligible and Most Impacted and Distressed (MID) Counties and ZIP Codes

Figure 6-1: Eligible CDBG-MIT Counties

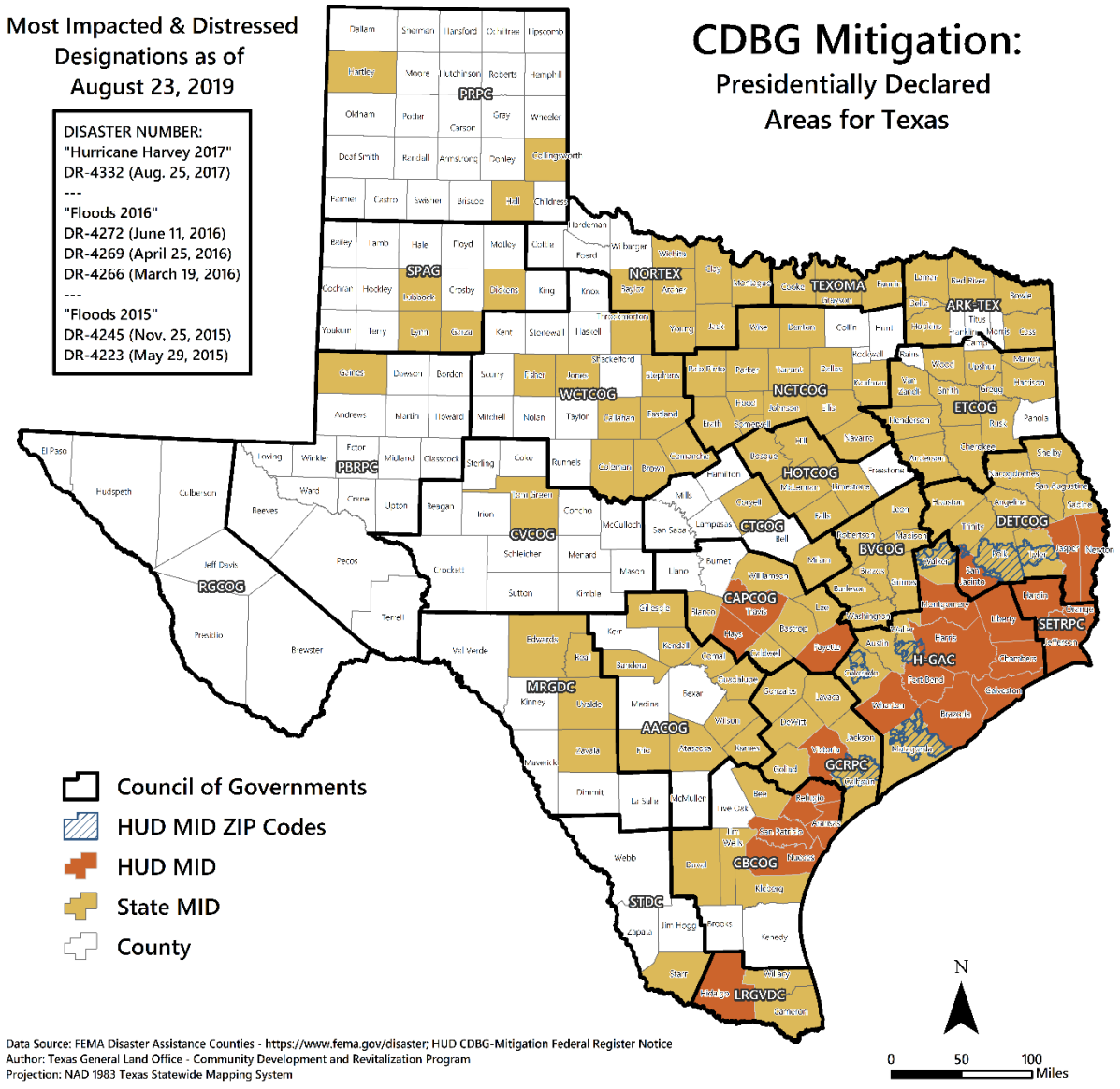


Figure 6-2: CDBG-MIT Most Impacted ZIP Codes

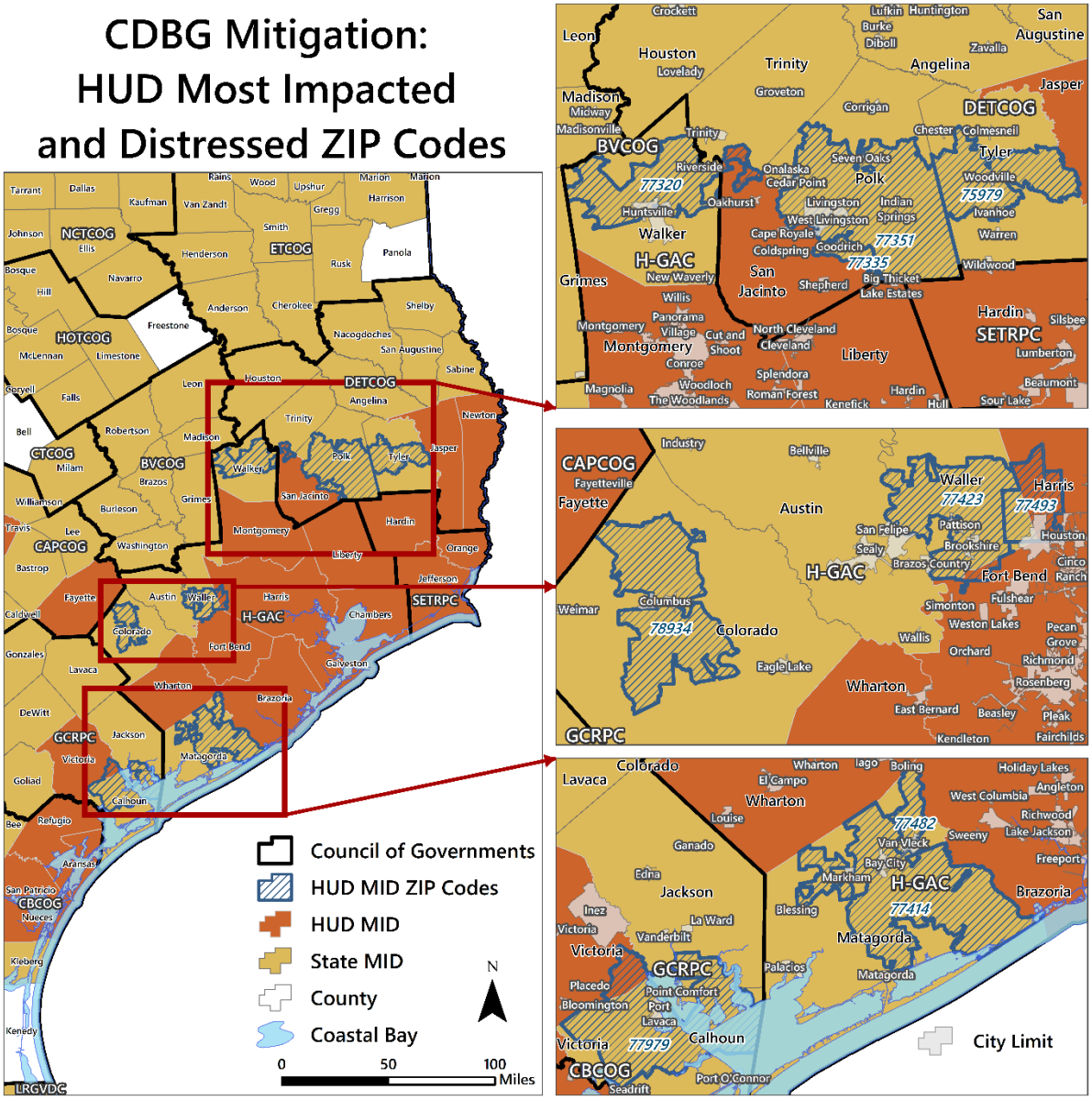


Table 6-1: CDBG-MIT Eligible Counties by Declared Disaster

County	2015	2016	Harvey (2017)
Anderson	-	State MID	-
Angelina	State MID	State MID	-
Aransas	-	-	HUD MID
Archer	State MID	-	-
Atascosa	State MID	-	-
Austin	State MID	State MID	State MID
Bandera	-	State MID	-
Bastrop	State MID	State MID	State MID
Baylor	State MID	-	-
Bee	-	-	State MID
Blanco	State MID	-	-
Bosque	State MID	State MID	-
Bowie	State MID	-	-
Brazoria	State MID	HUD MID	HUD MID
Brazos	-	State MID	-
Brown	State MID	State MID	-
Burleson	State MID	State MID	State MID
Caldwell	State MID	State MID	State MID
Calhoun	-	-	State MID
Callahan	State MID	State MID	-
Cameron	State MID	-	-
Cass	State MID	State MID	-
Chambers	-	-	HUD MID
Cherokee	State MID	State MID	-
Clay	State MID	-	-
Coleman	-	State MID	-
Collingsworth	State MID	-	-
Colorado	State MID	State MID	State MID
Comal	State MID	-	State MID
Comanche	State MID	State MID	-
Cooke	State MID	-	-
Coryell	State MID	State MID	-
Dallas	State MID	-	-
Delta	State MID	-	-
Denton	State MID	-	-
DeWitt	State MID	-	State MID

County	2015	2016	Harvey (2017)
Dickens	State MID	-	-
Duval	State MID	-	-
Eastland	State MID	State MID	-
Edwards	State MID	-	-
Ellis	State MID	-	-
Erath	State MID	State MID	-
Falls	-	State MID	-
Fannin	State MID	State MID	-
Fayette	State MID	State MID	HUD MID
Fisher	-	State MID	-
Fort Bend	State MID	HUD MID	HUD MID
Frio	State MID	-	-
Gaines	State MID	-	-
Galveston	State MID	-	HUD MID
Garza	State MID	-	-
Gillespie	State MID	-	-
Goliad	-	-	State MID
Gonzales	State MID	-	State MID
Grayson	State MID	-	-
Gregg	-	State MID	-
Grimes	State MID	State MID	State MID
Guadalupe	State MID	-	State MID
Hall	State MID	State MID	-
Hardin	State MID	State MID	HUD MID
Harris	HUD MID	HUD MID	HUD MID
Harrison	State MID	State MID	-
Hartley	State MID	-	-
Hays	HUD MID	-	-
Henderson	State MID	State MID	-
Hidalgo	HUD MID	State MID	-
Hill	State MID	-	-
Hood	State MID	State MID	-
Hopkins	State MID	-	-
Houston	State MID	State MID	-
Jack	State MID	-	-
Jackson	-	-	State MID
Jasper	State MID	State MID	HUD MID

County	2015	2016	Harvey (2017)
Jefferson	-	-	HUD MID
Jim Wells	State MID	-	State MID
Johnson	State MID	-	-
Jones	State MID	State MID	-
Karnes	-	-	State MID
Kaufman	State MID	-	-
Kendall	State MID	-	-
Kleberg	-	State MID	State MID
Lamar	State MID	State MID	-
Lavaca	-	-	State MID
Lee	State MID	State MID	State MID
Leon	State MID	State MID	-
Liberty	State MID	State MID	HUD MID
Limestone	-	State MID	-
Lubbock	State MID	-	-
Lynn	State MID	-	-
Madison	State MID	State MID	State MID
Marion	-	State MID	-
Matagorda	-	-	State MID
McLennan	State MID	-	-
Milam	State MID	State MID	State MID
Montague	State MID	-	-
Montgomery	State MID	HUD MID	HUD MID
Nacogdoches	State MID	-	-
Navarro	State MID	State MID	-
Newton	State MID	HUD MID	HUD MID
Nueces	State MID	-	HUD MID
Orange	State MID	State MID	HUD MID
Palo Pinto	State MID	State MID	-
Parker	State MID	State MID	-
Polk	State MID	State MID	State MID
Real	State MID	-	-
Red River	State MID	State MID	-
Refugio	State MID	-	HUD MID
Robertson	State MID	-	-
Rusk	State MID	-	-
Sabine	State MID	State MID	State MID
San Augustine	State MID	State MID	State MID
San Jacinto	State MID	State MID	HUD MID

County	2015	2016	Harvey (2017)
San Patricio	-	-	HUD MID
Shelby	State MID	State MID	-
Smith	State MID	State MID	-
Somervell	State MID	State MID	-
Starr	State MID	-	-
Stephens	-	State MID	-
Tarrant	State MID	-	-
Throckmorton	State MID	State MID	-
Tom Green	State MID	-	-
Travis	HUD MID	State MID	-
Trinity	State MID	State MID	-
Tyler	State MID	State MID	State MID
Upshur	-	State MID	-
Uvalde	State MID	-	-
Van Zandt	State MID	State MID	-
Victoria	State MID	-	HUD MID
Walker	State MID	State MID	State MID
Waller	State MID	State MID	State MID
Washington	State MID	State MID	State MID
Wharton	State MID	State MID	HUD MID
Wichita	State MID	-	-
Willacy	State MID	-	-
Williamson	State MID	-	-
Wilson	State MID	-	-
Wise	State MID	-	-
Wood	-	State MID	-
Young	State MID	-	-
Zavala	State MID	-	-

HUD MID ZIPs (Harvey 2017)	
75979	**77423**
77320	**77482**
77335	**77493**
77351	**77979**
77414	**78934**

6.2 Appendix B: Certifications – State of Texas

24 CFR 91.225 and 91.325 are waived. Each grantee receiving a direct allocation of CDBG-MIT funds must make the following certifications with its action plan:

a. The grantee certifies that it has in effect and is following a residential anti-displacement and relocation assistance plan in connection with any activity assisted with CDBG-MIT funding.

b. The grantee certifies its compliance with restrictions on lobbying required by 24 CFR part 87, together with disclosure forms, if required by part 87.

c. The grantee certifies that the action plan is authorized under state and local law (as applicable) and that the grantee, and any entity or entities designated by the grantee, and any contractor, subrecipient, or designated public agency carrying out an activity with CDBG-MIT funds, possess(es) the legal authority to carry out the program for which it is seeking funding, in accordance with applicable HUD regulations and this notice. The grantee certifies that activities to be undertaken with CDBG-MIT funds are consistent with its action plan.

d. The grantee certifies that it will comply with the acquisition and relocation requirements of the URA, as amended, and implementing regulations at 49 CFR part 24, except where waivers or alternative requirements are provided for CDBG-MIT funds.

e. The grantee certifies that it will comply with section 3 of the Housing and Urban Development Act of 1968 (12 U.S.C. 1701u) and implementing regulations at 24 CFR part 135.

f. The grantee certifies that it is following a detailed citizen participation plan that satisfies the requirements of 24 CFR 91.115 or 91.105 (except as provided for in notices providing waivers and alternative requirements for this grant). Also, each local government receiving assistance from a state grantee must follow a detailed citizen participation plan that satisfies the requirements of 24 CFR 570.486 (except as provided for in notices providing waivers and alternative requirements for this grant).

g. State grantee certifies that it has consulted with affected local governments in counties designated in covered major disaster declarations in the non-entitlement, entitlement, and tribal areas of the state in determining the uses of funds, including the method of distribution of funding, or activities carried out directly by the state.

h. The grantee certifies that it is complying with each of the following criteria:

(1) Funds will be used solely for necessary expenses related to mitigation activities, as applicable, in the most impacted and distressed areas for which the President declared a major disaster in 2015, 2016, or 2017 pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1974 (42 U.S.C. 5121 *et seq.*).

(2) With respect to activities expected to be assisted with CDBG-MIT funds, the relevant action plan has been developed to give priority to activities that will benefit low- and moderate-income families.

(3) The aggregate use of CDBG-MIT funds shall principally benefit low- and moderate-income families in a manner that ensures that at least 50 percent (or another percentage permitted by HUD in a waiver published in an applicable Federal Register notice) of the CDBG-MIT grant amount is expended for activities that benefit such persons.

(4) The grantee will not attempt to recover any capital costs of public improvements assisted with CDBG-MIT funds by assessing any amount against properties owned and occupied by persons of low- and moderate-income, including any fee charged or assessment made as a condition of obtaining access to such public improvements, unless: (a) CDBG-MIT funds are used to pay the proportion of such fee or assessment that relates to the capital costs of such public improvements that are financed from revenue sources other than under this title; or (b) for purposes of assessing any amount against properties owned and occupied by persons of moderate income, the grantee certifies to the Secretary that it lacks sufficient CDBG funds (in any form) to comply with the requirements of clause (a).

i. The grantee certifies that the grant will be conducted and administered in conformity with title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d), the Fair Housing Act (42 U.S.C. 3601-3619), and implementing regulations, and that it will affirmatively further fair housing.

j. The grantee certifies that it has adopted and is enforcing the following policies, and, in addition, must certify that they will require local governments that receive grant funds to certify that they have adopted and are enforcing:

(1) A policy prohibiting the use of excessive force by law enforcement agencies within its jurisdiction against any individuals engaged in nonviolent civil rights demonstrations; and

(2) A policy of enforcing applicable state and local laws against physically barring entrance to or exit from a facility or location that is the subject of such nonviolent civil rights demonstrations within its jurisdiction.

k. The grantee certifies that it (and any subrecipient or administering entity) currently has or will develop and maintain the capacity to carry out mitigation activities, as applicable, in a timely manner and that the grantee has reviewed the respective requirements of this notice. The grantee certifies to the accuracy of its Public Law 115-56 Financial Management and Grant Compliance certification checklist, or other recent certification submission, if approved by HUD, and related supporting documentation referenced at section V.A.1.a of this notice and its implementation plan and capacity assessment and related submissions to HUD referenced at section V.A.1.b.

l. The grantee certifies that it considered the following resources in the preparation of its action plan, as appropriate: FEMA Local Mitigation Planning Handbook: *https://www.fema.gov/media-library-data/20130726-1910-25045-9160/fema_local_mitigation_handbook.pdf*; DHS Office of Infrastructure Protection: *https://www.dhs.gov/sites/default/files/publications/ip-fact-sheet-508.pdf*; National Association of Counties, Improving Lifelines (2014): *https://www.naco.org/sites/default/files/documents/NACo_ResilientCounties_Lifelines_Nov2014.pdf*; the National Interagency Coordination Center (NICC) for coordinating the mobilization of resources for wildland fire: (*https://www.nifc.gov/nicc/*); the U.S. Forest Service's resources around wildland fire (*https://www.fs.fed.us/managing-land/fire*); and HUD's CPD Mapping tool: *https://egis.hud.gov/cpdmaps/*.

m. The grantee certifies that it will not use CDBG-MIT funds for any activity in an area identified as flood prone for land use or hazard mitigation planning purposes by the state, local, or tribal government or delineated as a Special Flood Hazard Area (or 100-year floodplain) in FEMA's most current flood advisory maps, unless it also ensures that the action is designed or modified to minimize harm to or within the floodplain, in accordance with Executive Order 11988 and 24 CFR part 55. The relevant data source for this provision is the state, local, and tribal government land use regulations and hazard mitigation plans and the latest-issued FEMA data or guidance, which includes advisory data (such as Advisory Base Flood Elevations) or preliminary and final Flood Insurance Rate Maps.

n. The grantee certifies that its activities concerning lead-based paint will comply with the requirements of 24 CFR part 35, subparts A, B, I, K, and R.

o. The grantee certifies that it will comply with environmental requirements at 24 CFR part 58.

p. The grantee certifies that it will comply with applicable laws.

Warning: Any person who knowingly makes a false claim or statement to HUD may be subject to civil or criminal penalties under 18 U.S.C. 287, 1001 and 31 U.S.C. 3729.

6.3 Appendix C: Program Expenditures

Table 6-2: Timeline of Expenditures by Program

Programs	Allocations	2020			
		Q1	Q2	Q3	Q4
2015 Floods State Mitigation Competition	$ 46,096,950		$ -	$ -	$ -
2016 Floods State Mitigation Competition	$ 147,680,760		$ -	$ -	$ -
Hurricane Harvey State Mitigation Competition	$ 2,144,776,720		$ -	$ -	$ -
Regional Mitigation Program	$ 500,000,000		$ -	$ -	$ -
HMGP: Supplemental	$ 170,000,000		$ -	$ -	$ -
Coastal Resiliency Program	$ 100,000,000		$ -	$ -	$ -
Housing Oversubscription Supplemental	$ 400,000,000		$ 20,000,000	$ 40,000,000	$ 60,000,000
Resilient Home Program	$ 100,000,000		$ -	$ -	$ 4,000,000
Hazard Mitigation Plans	$ 30,000,000		$ -	$ -	$ -
Resilient Communities Program	$ 100,000,000		$ -	$ -	$ -
Regional and State Planning	$ 214,859,450		$ 4,297,189	$ 4,297,189	$ 4,297,189
State Project Delivery	$ 128,915,670		$ 700,000	$ 1,400,000	$ 2,240,000
State Administration	$ 214,859,450		$ 4,297,189	$ 4,297,189	$ 4,297,189
Grand Total	$ 4,297,189,000		$ 29,294,378	$ 49,994,378	$ 74,834,378
Remaining Funds	$ 4,297,189,000		$ 4,267,894,622	$ 4,217,900,244	$ 4,143,065,866

Programs	Allocations	2021			
		Q1	Q2	Q3	Q4
2015 Floods State Mitigation Competition	$ 46,096,950	$ -	$ -	$ 460,970	$ 691,454
2016 Floods State Mitigation Competition	$ 147,680,760	$ -	$ -	$ 1,476,808	$ 2,215,211
Hurricane Harvey State Mitigation Competition	$ 2,144,776,720	$ -	$ -	$ 10,723,884	$ 10,723,884
Regional Mitigation Program	$ 500,000,000	$ -	$ -	$ -	$ 5,000,000
HMGP: Supplemental	$ 170,000,000	$ -	$ 1,700,000	$ 2,550,000	$ 2,550,000
Coastal Resiliency Program	$ 100,000,000	$ -	$ 1,000,000	$ 1,500,000	$ 1,500,000
Housing Oversubscription Supplemental	$ 400,000,000	$ 80,000,000	$ 80,000,000	$ 40,000,000	$ 40,000,000
Resilient Home Program	$ 100,000,000	$ 20,000,000	$ 40,000,000	$ 20,000,000	$ 8,000,000
Hazard Mitigation Plans	$ 30,000,000	$ -	$ -	$ 1,050,000	$ 1,050,000
Resilient Communities Program	$ 100,000,000	$ -	$ -	$ 3,500,000	$ 3,500,000
Regional and State Planning	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
State Project Delivery	$ 128,915,670	$ 3,500,000	$ 4,294,500	$ 2,844,158	$ 2,633,069
State Administration	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
Grand Total	$ 4,297,189,000	$ 112,094,378	$ 135,588,878	$ 92,700,197	$ 86,457,996
Remaining Funds	$ 4,297,189,000	$ 4,030,971,488	$ 3,895,382,610	$ 3,802,682,413	$ 3,716,224,417

Programs	Allocations	2022			
		Q1	Q2	Q3	Q4
2015 Floods State Mitigation Competition	$ 46,096,950	$ 691,454	$ 4,609,695	$ 6,914,543	$ 6,914,543
2016 Floods State Mitigation Competition	$ 147,680,760	$ 2,215,211	$ 14,768,076	$ 22,152,114	$ 22,152,114
Hurricane Harvey State Mitigation Competition	$ 2,144,776,720	$ 10,723,884	$ 10,723,884	$ 21,447,767	$ 21,447,767
Regional Mitigation Program	$ 500,000,000	$ 7,500,000	$ 7,500,000	$ 50,000,000	$ 75,000,000
HMGP: Supplemental	$ 170,000,000	$ 17,000,000	$ 25,500,000	$ 25,500,000	$ 51,000,000
Coastal Resiliency Program	$ 100,000,000	$ 10,000,000	$ 15,000,000	$ 15,000,000	$ 30,000,000
Housing Oversubscription Supplemental	$ 400,000,000	$ 20,000,000	$ 12,000,000	$ 8,000,000	$ -
Resilient Home Program	$ 100,000,000	$ 4,000,000	$ 4,000,000	$ -	$ -
Hazard Mitigation Plans	$ 30,000,000	$ 1,050,000	$ 1,050,000	$ 1,050,000	$ 1,050,000
Resilient Communities Program	$ 100,000,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000
Regional and State Planning	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
State Project Delivery	$ 128,915,670	$ 2,683,819	$ 3,452,808	$ 5,374,755	$ 7,387,255
State Administration	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
Grand Total	$ 4,297,189,000	$ 87,958,746	$ 110,698,841	$ 167,533,557	$ 227,046,057
Remaining Funds	$ 4,297,189,000	$ 3,628,265,670	$ 3,517,566,830	$ 3,350,033,273	$ 3,122,987,217

Programs	Allocations	2023			
		Q1	Q2	Q3	Q4
2015 Floods State Mitigation Competition	$ 46,096,950	$ 13,829,085	$ 6,914,543	$ 5,070,665	$ -
2016 Floods State Mitigation Competition	$ 147,680,760	$ 44,304,228	$ 22,152,114	$ 16,244,884	$ -
Hurricane Harvey State Mitigation Competition	$ 2,144,776,720	$ 42,895,534	$ 42,895,534	$ 107,238,836	$ 107,238,836
Regional Mitigation Program	$ 500,000,000	$ 75,000,000	$ 150,000,000	$ 75,000,000	$ 30,000,000
HMGP: Supplemental	$ 170,000,000	$ 25,500,000	$ 10,200,000	$ 8,500,000	$ -
Coastal Resiliency Program	$ 100,000,000	$ 15,000,000	$ 6,000,000	$ 5,000,000	$ -
Housing Oversubscription Supplemental	$ 400,000,000	$ -	$ -	$ -	$ -
Resilient Home Program	$ 100,000,000	$ -	$ -	$ -	$ -
Hazard Mitigation Plans	$ 30,000,000	$ 1,050,000	$ 1,050,000	$ 1,050,000	$ 1,050,000
Resilient Communities Program	$ 100,000,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000
Regional and State Planning	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
State Project Delivery	$ 128,915,670	$ 7,737,760	$ 8,494,927	$ 7,756,153	$ 4,962,609
State Administration	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
Grand Total	$ 4,297,189,000	$ 237,410,985	$ 259,801,496	$ 237,954,916	$ 155,345,823
Remaining Funds	$ 4,297,189,000	$ 2,885,576,232	$ 2,625,774,736	$ 2,387,819,820	$ 2,232,473,997

Programs	Allocations	2024			
		Q1	Q2	Q3	Q4
2015 Floods State Mitigation Competition	$ 46,096,950	$ -	$ -	$ -	$ -
2016 Floods State Mitigation Competition	$ 147,680,760	$ -	$ -	$ -	$ -
Hurricane Harvey State Mitigation Competition	$ 2,144,776,720	$ 107,238,836	$ 107,238,836	$ 107,238,836	$ 107,238,836
Regional Mitigation Program	$ 500,000,000	$ 25,000,000	$ -	$ -	$ -
HMGP: Supplemental	$ 170,000,000	$ -	$ -	$ -	$ -
Coastal Resiliency Program	$ 100,000,000	$ -	$ -	$ -	$ -
Housing Oversubscription Supplemental	$ 400,000,000	$ -	$ -	$ -	$ -
Resilient Home Program	$ 100,000,000	$ -	$ -	$ -	$ -
Hazard Mitigation Plans	$ 30,000,000	$ 1,050,000	$ 1,050,000	$ 1,050,000	$ 1,050,000
Resilient Communities Program	$ 100,000,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000
Regional and State Planning	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
State Project Delivery	$ 128,915,670	$ 4,787,609	$ 3,912,609	$ 3,912,609	$ 3,912,609
State Administration	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
Grand Total	$ 4,297,189,000	$ 150,170,823	$ 124,295,823	$ 124,295,823	$ 124,295,823
Remaining Funds	$ 4,297,189,000	$ 2,082,303,174	$ 1,958,007,351	$ 1,833,711,527	$ 1,709,415,704

Programs	Allocations	2025			
		Q1	Q2	Q3	Q4
2015 Floods State Mitigation Competition	$ 46,096,950	$ -	$ -	$ -	$ -
2016 Floods State Mitigation Competition	$ 147,680,760	$ -	$ -	$ -	$ -
Hurricane Harvey State Mitigation Competition	$ 2,144,776,720	$ 107,238,836	$ 107,238,836	$ 107,238,836	$ 107,238,836
Regional Mitigation Program	$ 500,000,000	$ -	$ -	$ -	$ -
HMGP: Supplemental	$ 170,000,000	$ -	$ -	$ -	$ -
Coastal Resiliency Program	$ 100,000,000	$ -	$ -	$ -	$ -
Housing Oversubscription Supplemental	$ 400,000,000	$ -	$ -	$ -	$ -
Resilient Home Program	$ 100,000,000	$ -	$ -	$ -	$ -
Hazard Mitigation Plans	$ 30,000,000	$ 1,050,000	$ 1,050,000	$ 1,050,000	$ 1,050,000
Resilient Communities Program	$ 100,000,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000
Regional and State Planning	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
State Project Delivery	$ 128,915,670	$ 3,912,609	$ 3,912,609	$ 3,912,609	$ 3,912,609
State Administration	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
Grand Total	$ 4,297,189,000	$ 124,295,823	$ 124,295,823	$ 124,295,823	$ 124,295,823
Remaining Funds	$ 4,297,189,000	$ 1,585,119,881	$ 1,460,824,058	$ 1,336,528,234	$ 1,212,232,411

Programs	Allocations	2026			
		Q1	Q2	Q3	Q4
2015 Floods State Mitigation Competition	$ 46,096,950	$ -	$ -	$ -	$ -
2016 Floods State Mitigation Competition	$ 147,680,760	$ -	$ -	$ -	$ -
Hurricane Harvey State Mitigation Competition	$ 2,144,776,720	$ 107,238,836	$ 85,791,069	$ 85,791,069	$ 85,791,069
Regional Mitigation Program	$ 500,000,000	$ -	$ -	$ -	$ -
HMGP: Supplemental	$ 170,000,000	$ -	$ -	$ -	$ -
Coastal Resiliency Program	$ 100,000,000	$ -	$ -	$ -	$ -
Housing Oversubscription Supplemental	$ 400,000,000	$ -	$ -	$ -	$ -
Resilient Home Program	$ 100,000,000	$ -	$ -	$ -	$ -
Hazard Mitigation Plans	$ 30,000,000	$ 1,050,000	$ 1,050,000	$ 1,050,000	$ 1,050,000
Resilient Communities Program	$ 100,000,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000
Regional and State Planning	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
State Project Delivery	$ 128,915,670	$ 3,912,609	$ 3,161,937	$ 3,178,012	$ 3,161,937
State Administration	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
Grand Total	$ 4,297,189,000	$ 124,295,823	$ 102,097,384	$ 102,113,459	$ 102,097,384
Remaining Funds	$ 4,297,189,000	$ 1,087,936,588	$ 985,839,204	$ 883,725,744	$ 781,628,360

Programs	Allocations	2027			
		Q1	Q2	Q3	Q4
2015 Floods State Mitigation Competition	$ 46,096,950	$ -	$ -	$ -	$ -
2016 Floods State Mitigation Competition	$ 147,680,760	$ -	$ -	$ -	$ -
Hurricane Harvey State Mitigation Competition	$ 2,144,776,720	$ 64,343,302	$ 64,343,302	$ 64,343,302	$ 64,343,302
Regional Mitigation Program	$ 500,000,000	$ -	$ -	$ -	$ -
HMGP: Supplemental	$ 170,000,000	$ -	$ -	$ -	$ -
Coastal Resiliency Program	$ 100,000,000	$ -	$ -	$ -	$ -
Housing Oversubscription Supplemental	$ 400,000,000	$ -	$ -	$ -	$ -
Resilient Home Program	$ 100,000,000	$ -	$ -	$ -	$ -
Hazard Mitigation Plans	$ 30,000,000	$ 1,050,000	$ 1,050,000	$ 1,050,000	$ 1,050,000
Resilient Communities Program	$ 100,000,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000
Regional and State Planning	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
State Project Delivery	$ 128,915,670	$ 2,411,266	$ 2,066,799	$ 2,066,799	$ 2,066,799
State Administration	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
Grand Total	$ 4,297,189,000	$ 79,898,945	$ 79,554,479	$ 79,554,479	$ 79,554,479
Remaining Funds	$ 4,297,189,000	$ 701,729,415	$ 622,174,936	$ 542,620,458	$ 463,065,979

Programs	Allocations	2028			
		Q1	Q2	Q3	Q4
2015 Floods State Mitigation Competition	$ 46,096,950	$ -	$ -	$ -	$ -
2016 Floods State Mitigation Competition	$ 147,680,760	$ -	$ -	$ -	$ -
Hurricane Harvey State Mitigation Competition	$ 2,144,776,720	$ 42,895,534	$ 42,895,534	$ 42,895,534	$ 21,447,767
Regional Mitigation Program	$ 500,000,000	$ -	$ -	$ -	$ -
HMGP: Supplemental	$ 170,000,000	$ -	$ -	$ -	$ -
Coastal Resiliency Program	$ 100,000,000	$ -	$ -	$ -	$ -
Housing Oversubscription Supplemental	$ 400,000,000	$ -	$ -	$ -	$ -
Resilient Home Program	$ 100,000,000	$ -	$ -	$ -	$ -
Hazard Mitigation Plans	$ 30,000,000	$ 1,050,000	$ 1,050,000	$ 600,000	$ -
Resilient Communities Program	$ 100,000,000	$ 3,500,000	$ 3,500,000	$ 2,000,000	$ -
Regional and State Planning	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
State Project Delivery	$ 128,915,670	$ 1,423,366	$ 1,423,366	$ 1,364,866	$ 750,672
State Administration	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
Grand Total	$ 4,297,189,000	$ 57,463,278	$ 57,463,278	$ 55,454,778	$ 30,792,817
Remaining Funds	$ 4,297,189,000	$ 405,602,701	$ 348,139,422	$ 292,684,644	$ 261,891,827

Programs	Allocations	2029			
		Q1	Q2	Q3	Q4
2015 Floods State Mitigation Competition	$ 46,096,950	$ -	$ -	$ -	$ -
2016 Floods State Mitigation Competition	$ 147,680,760	$ -	$ -	$ -	$ -
Hurricane Harvey State Mitigation Competition	$ 2,144,776,720	$ 21,447,767	$ 21,447,767	$ 21,447,767	$ 21,447,767
Regional Mitigation Program	$ 500,000,000	$ -	$ -	$ -	$ -
HMGP: Supplemental	$ 170,000,000	$ -	$ -	$ -	$ -
Coastal Resiliency Program	$ 100,000,000	$ -	$ -	$ -	$ -
Housing Oversubscription Supplemental	$ 400,000,000	$ -	$ -	$ -	$ -
Resilient Home Program	$ 100,000,000	$ -	$ -	$ -	$ -
Hazard Mitigation Plans	$ 30,000,000	$ -	$ -	$ -	$ -
Resilient Communities Program	$ 100,000,000	$ -	$ -	$ -	$ -
Regional and State Planning	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
State Project Delivery	$ 128,915,670	$ 750,672	$ 750,672	$ 750,672	$ 750,672
State Administration	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
Grand Total	$ 4,297,189,000	$ 30,792,817	$ 30,792,817	$ 30,792,817	$ 30,792,817
Remaining Funds	$ 4,297,189,000	$ 231,099,010	$ 200,306,193	$ 169,513,376	$ 138,720,559

Programs	Allocations	2030			
		Q1	Q2	Q3	Q4
2015 Floods State Mitigation Competition	$ 46,096,950	$ -	$ -	$ -	$ -
2016 Floods State Mitigation Competition	$ 147,680,760	$ -	$ -	$ -	$ -
Hurricane Harvey State Mitigation Competition	$ 2,144,776,720	$ 21,447,767	$ 21,447,767	$ -	$ -
Regional Mitigation Program	$ 500,000,000	$ -	$ -	$ -	$ -
HMGP: Supplemental	$ 170,000,000	$ -	$ -	$ -	$ -
Coastal Resiliency Program	$ 100,000,000	$ -	$ -	$ -	$ -
Housing Oversubscription Supplemental	$ 400,000,000	$ -	$ -	$ -	$ -
Resilient Home Program	$ 100,000,000	$ -	$ -	$ -	$ -
Hazard Mitigation Plans	$ 30,000,000	$ -	$ -	$ -	$ -
Resilient Communities Program	$ 100,000,000	$ -	$ -	$ -	$ -
Regional and State Planning	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
State Project Delivery	$ 128,915,670	$ 643,433	$ 643,433	$ -	$ -
State Administration	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
Grand Total	$ 4,297,189,000	$ 30,685,578	$ 30,685,578	$ 8,594,378	$ 8,594,378
Remaining Funds	$ 4,297,189,000	$ 108,034,980	$ 77,349,402	$ 68,755,024	$ 60,160,646

Programs	Allocations	2031			
		Q1	Q2	Q3	Q4
2015 Floods State Mitigation Competition	$ 46,096,950	$ -	$ -	$ -	$ -
2016 Floods State Mitigation Competition	$ 147,680,760	$ -	$ -	$ -	$ -
Hurricane Harvey State Mitigation Competition	$ 2,144,776,720	$ -	$ -	$ -	$ -
Regional Mitigation Program	$ 500,000,000	$ -	$ -	$ -	$ -
HMGP: Supplemental	$ 170,000,000	$ -	$ -	$ -	$ -
Coastal Resiliency Program	$ 100,000,000	$ -	$ -	$ -	$ -
Housing Oversubscription Supplemental	$ 400,000,000	$ -	$ -	$ -	$ -
Resilient Home Program	$ 100,000,000	$ -	$ -	$ -	$ -
Hazard Mitigation Plans	$ 30,000,000	$ -	$ -	$ -	$ -
Resilient Communities Program	$ 100,000,000	$ -	$ -	$ -	$ -
Regional and State Planning	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
State Project Delivery	$ 128,915,670	$ -	$ -	$ -	$ -
State Administration	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ 4,297,189
Grand Total	$ 4,297,189,000	$ 8,594,378	$ 8,594,378	$ 8,594,378	$ 8,594,378
Remaining Funds	$ 4,297,189,000	$ 51,566,268	$ 42,971,890	$ 34,377,512	$ 25,783,134

Programs	Allocations	2032			
		Q1	Q2	Q3	Q4
2015 Floods State Mitigation Competition	$ 46,096,950	$ -	$ -	$ -	$ -
2016 Floods State Mitigation Competition	$ 147,680,760	$ -	$ -	$ -	$ -
Hurricane Harvey State Mitigation Competition	$ 2,144,776,720	$ -	$ -	$ -	$ -
Regional Mitigation Program	$ 500,000,000	$ -	$ -	$ -	$ -
HMGP: Supplemental	$ 170,000,000	$ -	$ -	$ -	$ -
Coastal Resiliency Program	$ 100,000,000	$ -	$ -	$ -	$ -
Housing Oversubscription Supplemental	$ 400,000,000	$ -	$ -	$ -	$ -
Resilient Home Program	$ 100,000,000	$ -	$ -	$ -	$ -
Hazard Mitigation Plans	$ 30,000,000	$ -	$ -	$ -	$ -
Resilient Communities Program	$ 100,000,000	$ -	$ -	$ -	$ -
Regional and State Planning	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ -
State Project Delivery	$ 128,915,670	$ -	$ -	$ -	$ -
State Administration	$ 214,859,450	$ 4,297,189	$ 4,297,189	$ 4,297,189	$ -
Grand Total	$ 4,297,189,000	$ 8,594,378	$ 8,594,378	$ 8,594,378	$ -
Remaining Funds	$ 4,297,189,000	$ 17,188,756	$ 8,594,378	$ 0	$ 0

Figure 6-3: Projected Expenditures by Program

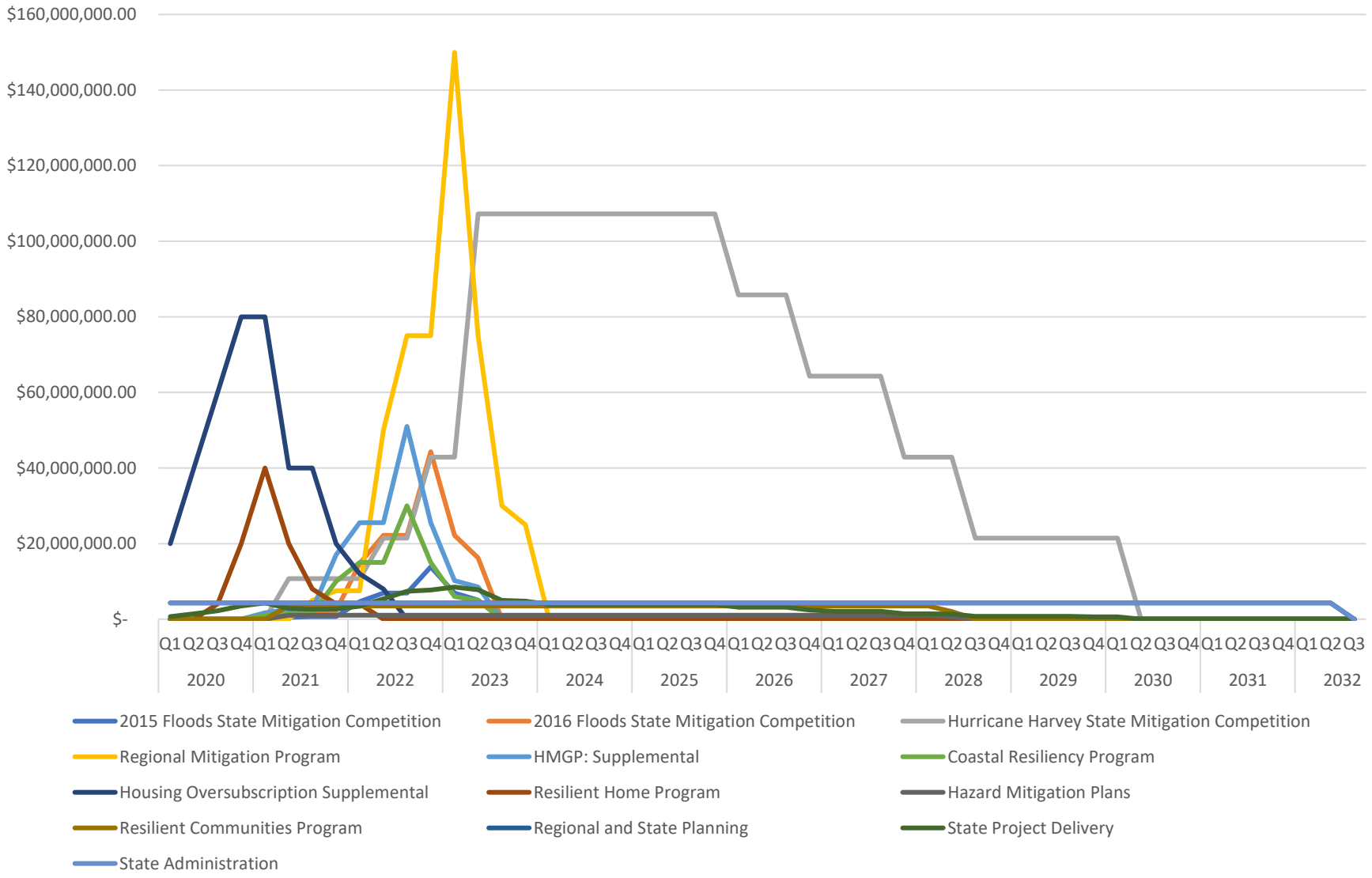
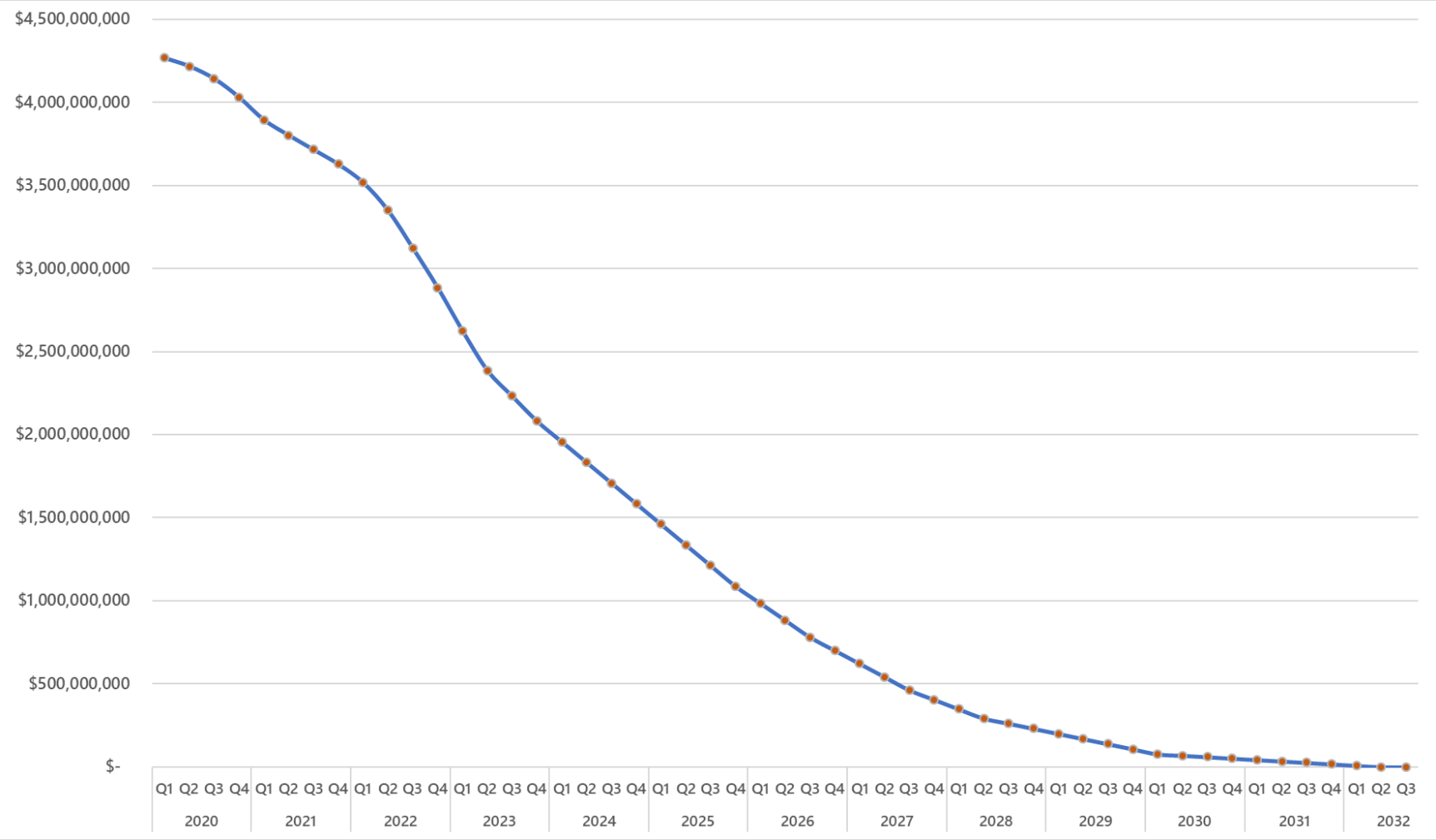


Figure 6-4: Remaining Funds Timeline

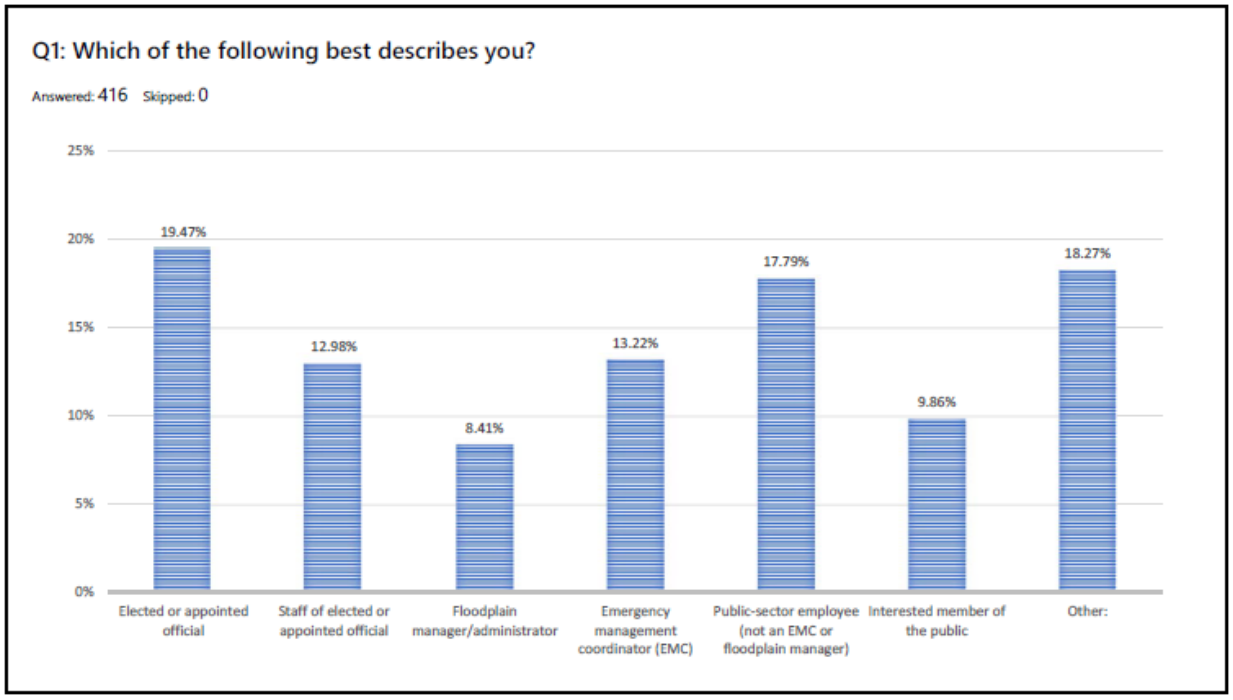


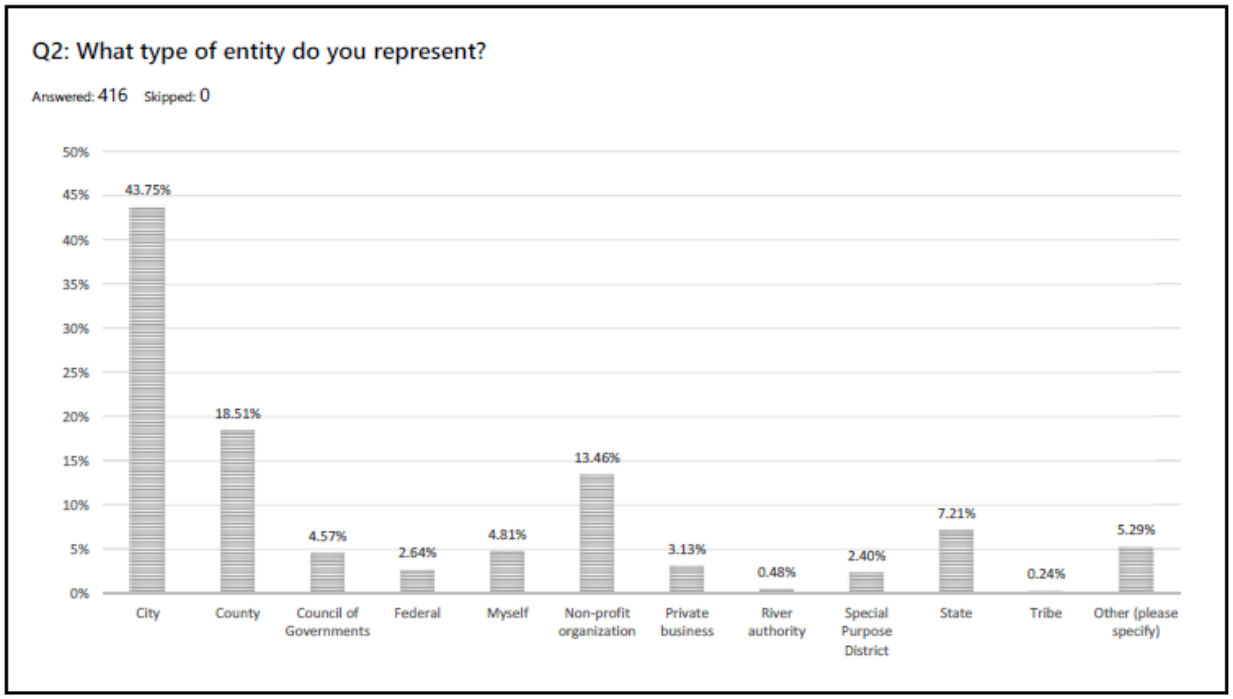
6.4 Appendix E: Consultations – State of Texas

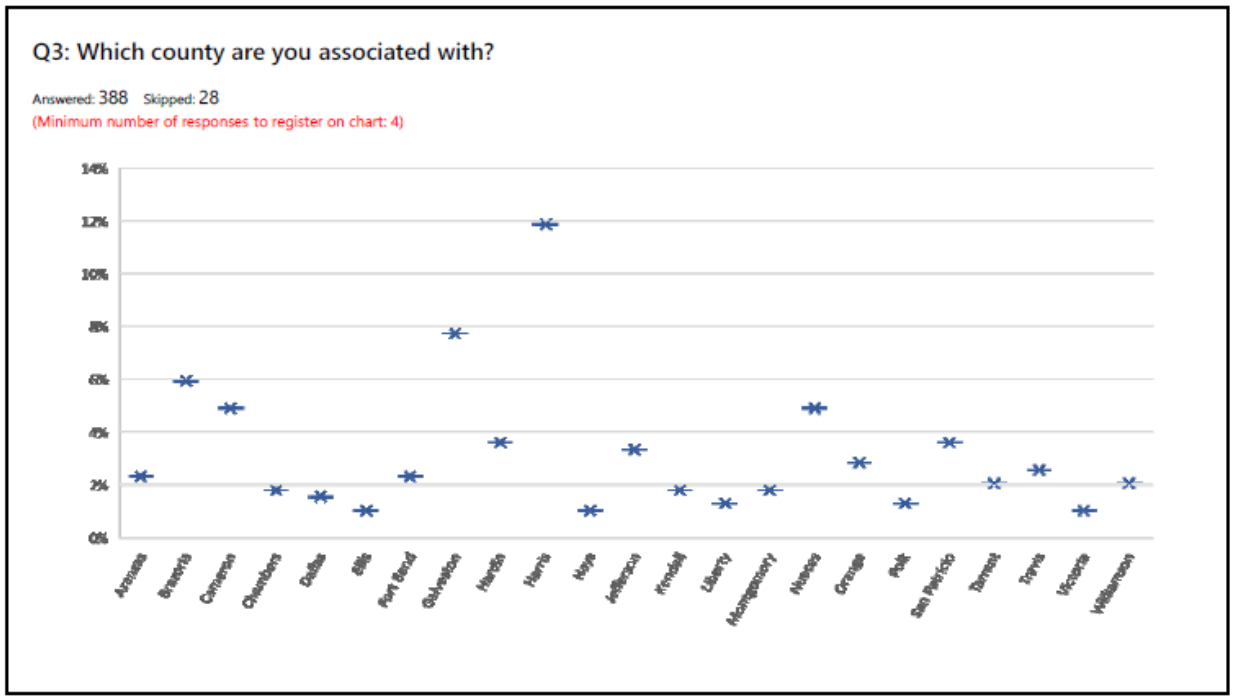
6.4.1 Mitigation Survey

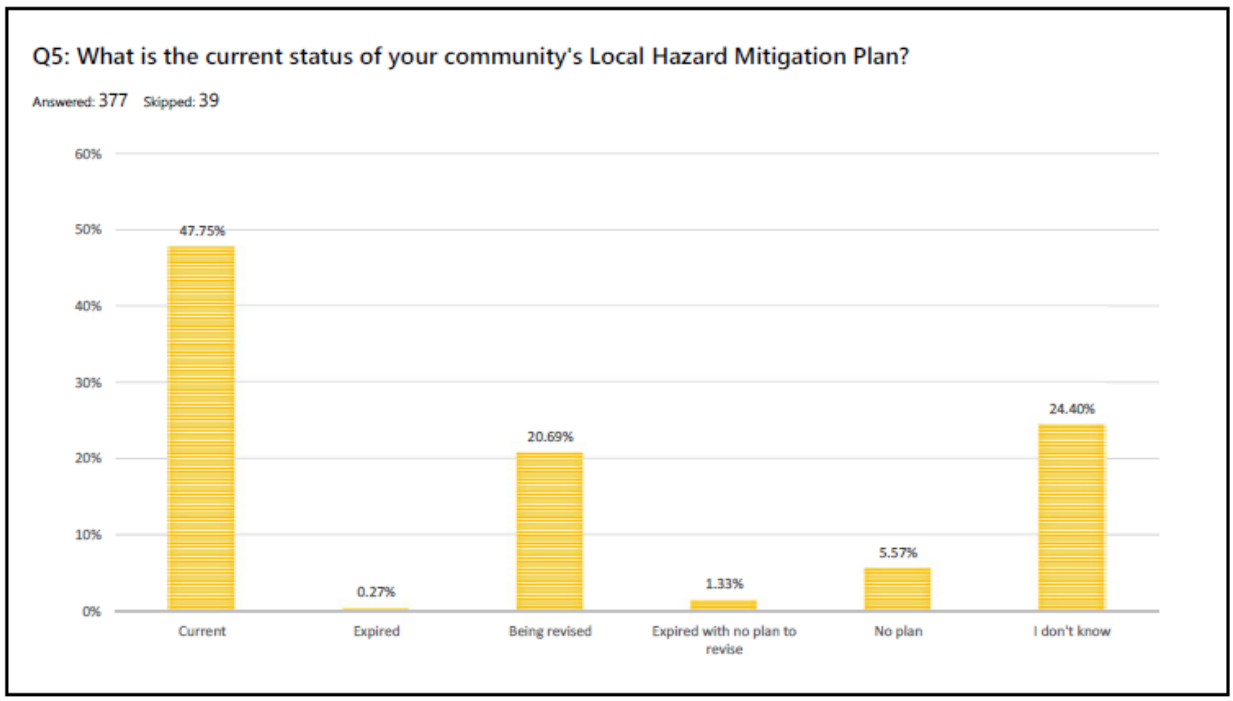
On February 20, 2019, the GLO launched a digital survey through the online service Survey Monkey to gauge the disaster recovery and mitigation needs of communities throughout the 140 eligible counties. Elected officials, representatives of local, regional, and state agencies, public housing representatives, private sector, and nonprofits focused on housing, disaster recovery, and the needs of low-income and vulnerable populations were contacted and encouraged to complete the survey. The survey was also announced on the GLO's recovery website, recovery.texas.gov, and was included in a two-page brochure that GLO staff distributed at stakeholder input sessions, public workshops, and conferences.

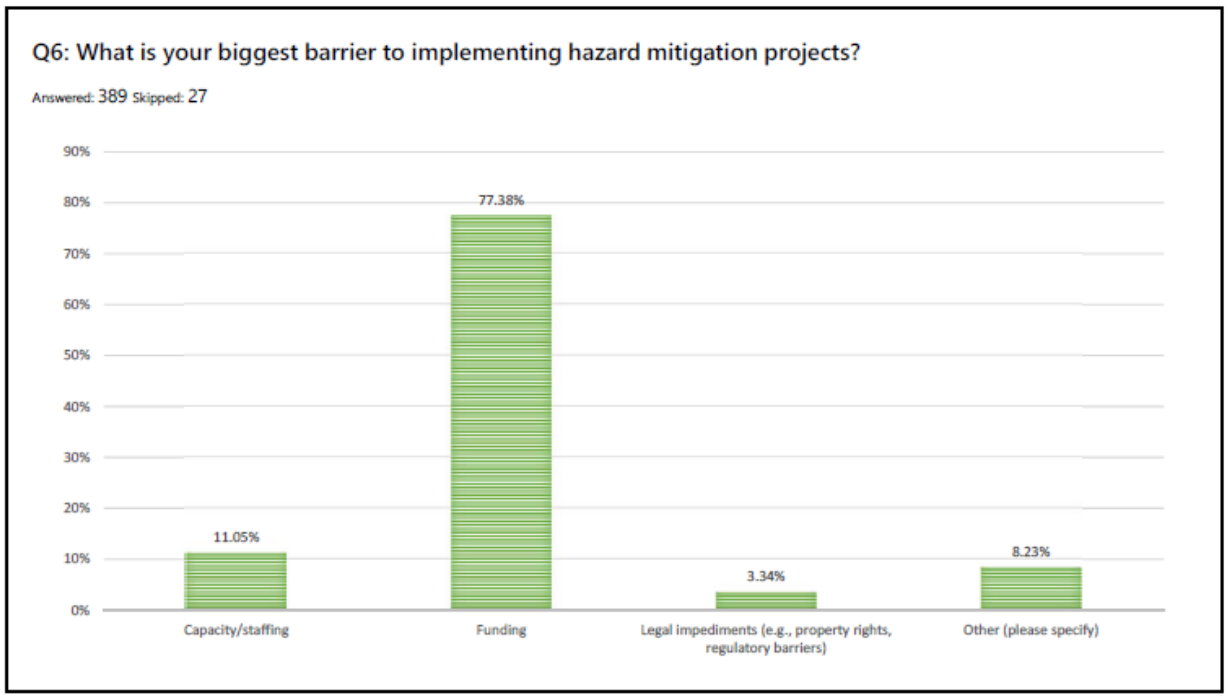
At the survey's end on September 20, 2019, a total of 416 respondents from across the state had provided valuable input. The results of the survey are included below in the following charts and graphs.

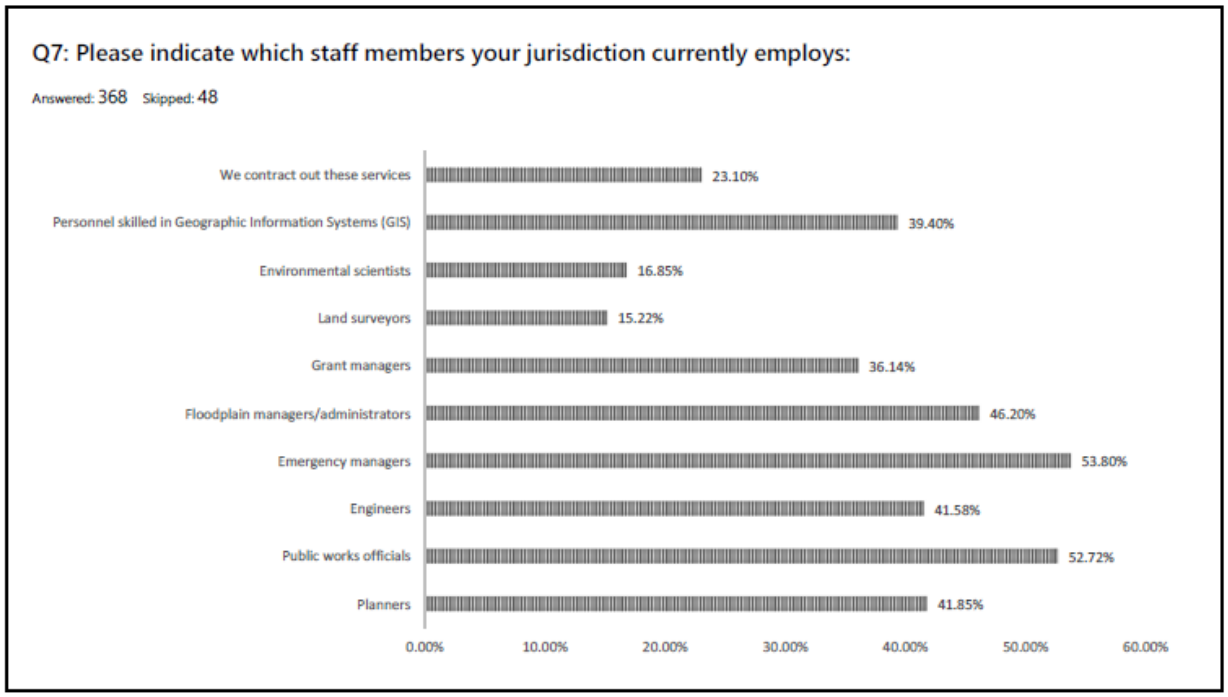

Q1: Which of the following best describes you?
Answered: 416 Skipped: 0
25%
20%
15%
10%
5%
0%
19.47%
12.98%
8.41%
13.22%
17.79%
9.86%
18.27%
Elected or appointed official
Staff of elected or appointed official
Floodplain manager/administrator
Emergency management coordinator (EMC)
Public-sector employee (not an EMC or floodplain manager)
Interested member of the public
Other:

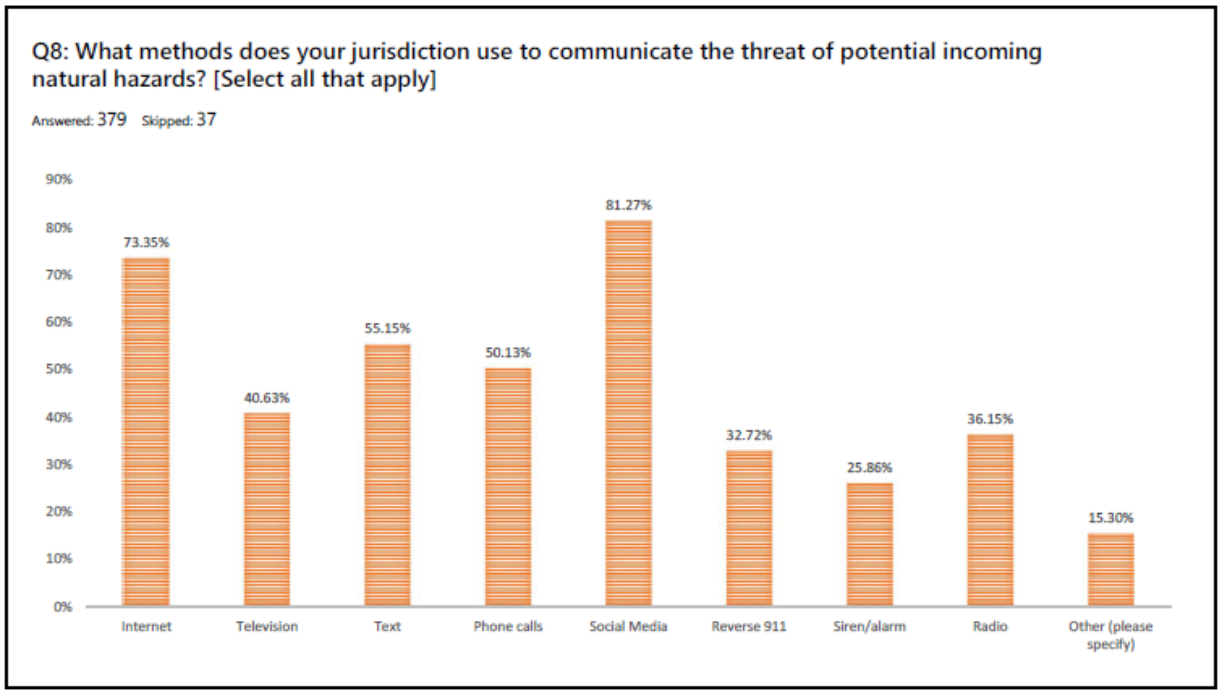

Q2: What type of entity do you represent?
Answered: 416 Skipped: 0
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
43.75%
18.51%
4.57%
2.64%
4.81%
13.46%
3.13%
0.48%
2.40%
7.21%
0.24%
5.29%
City
County
Council of Governments
Federal
Myself
Non-profit organization
Private business
River authority
Special Purpose District
State
Tribe
Other (please specify)

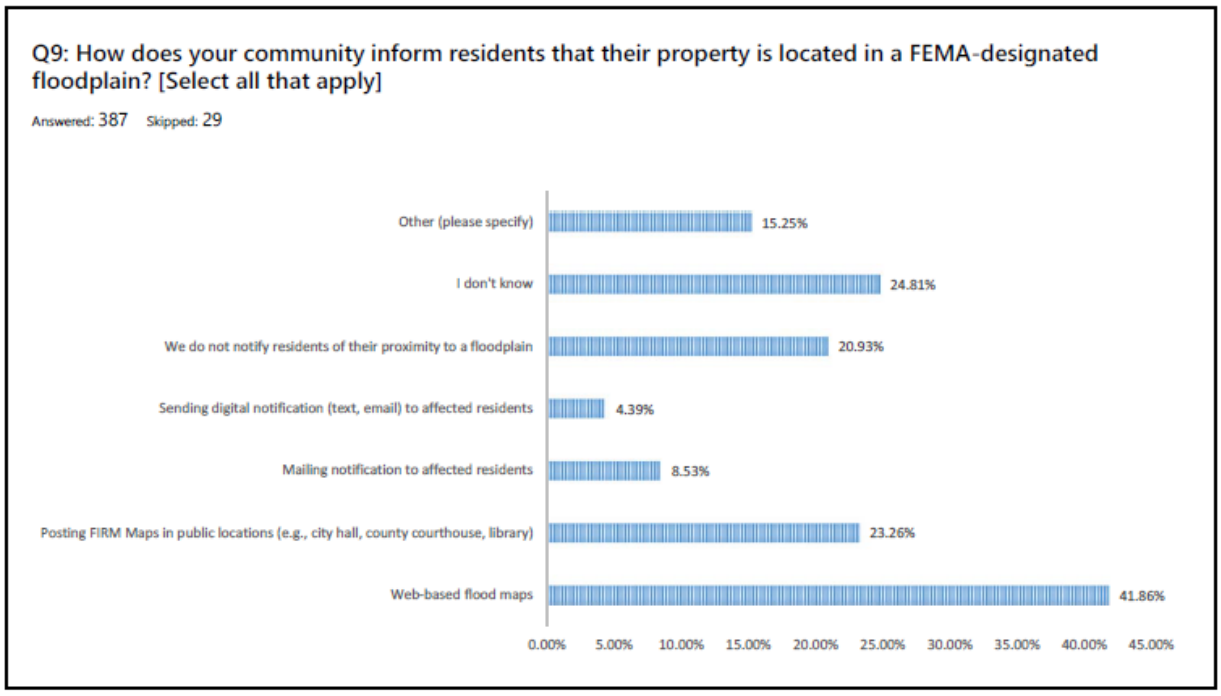

Q3: Which county are you associated with?
Answered: 388 Skipped: 28
(Minimum number of responses to register on chart: 4)
14%
12%
10%
8%
6%
4%
2%
0%
Aransas
Brazoria
Cameron
Chambers
Dallas
Ellis
Fort Bend
Galveston
Hardin
Harris
Hunt
Jefferson
Kendall
Liberty
Montgomery
Nueces
Orange
Polk
San Patricio
Tarrant
Travis
Victoria
Williamson


Q5: What is the current status of your community's Local Hazard Mitigation Plan?
Answered: 377 Skipped: 39
60%
50%
40%
30%
20%
10%
0%
47.75%
0.27%
20.69%
1.33%
5.57%
24.40%
Current
Expired
Being revised
Expired with no plan to revise
No plan
I don't know


Q6: What is your biggest barrier to implementing hazard mitigation projects?
Answered: 389 Skipped: 27
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
11.05%
77.38%
3.34%
8.23%
Capacity/staffing
Funding
Legal impediments (e.g., property rights, regulatory barriers)
Other (please specify)

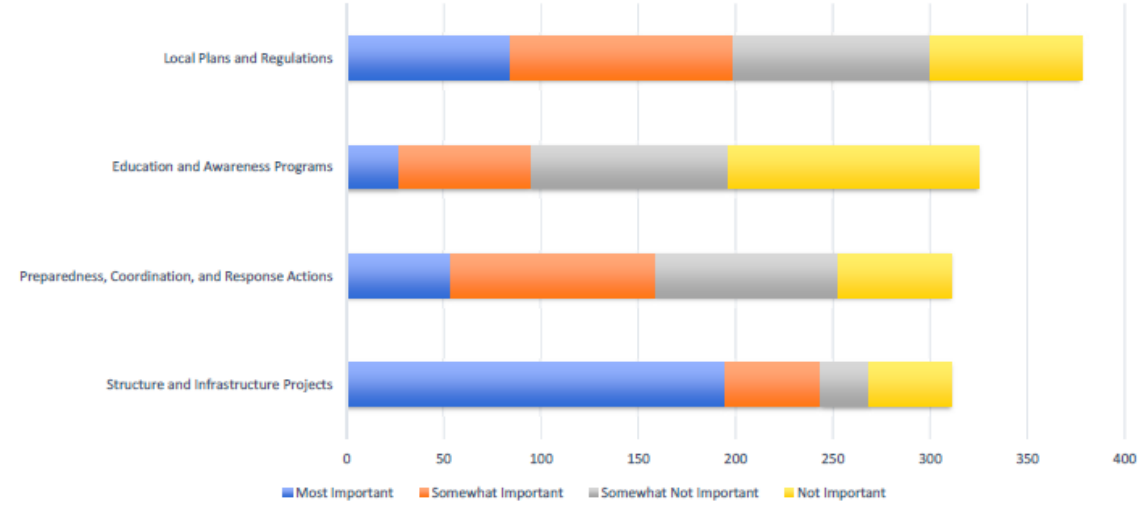

Q7: Please indicate which staff members your jurisdiction currently employs:
Answered: 368 Skipped: 48
We contract out these services
23.10%
Personnel skilled in Geographic Information Systems (GIS)
39.40%
Environmental scientists
16.85%
Land surveyors
15.22%
Grant managers
36.14%
Floodplain managers/administrators
46.20%
Emergency managers
53.80%
Engineers
41.58%
Public works officials
52.72%
Planners
41.85%
0.00%
10.00%
20.00%
30.00%
40.00%
50.00%
60.00%


Q8: What methods does your jurisdiction use to communicate the threat of potential incoming natural hazards? [Select all that apply]
Answered: 379 Skipped: 37
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
73.35%
40.63%
55.15%
50.13%
81.27%
32.72%
25.86%
36.15%
15.30%
Internet
Television
Text
Phone calls
Social Media
Reverse 911
Siren/alarm
Radio
Other (please specify)


Q9: How does your community inform residents that their property is located in a FEMA-designated floodplain? [Select all that apply]
Answered: 387 Skipped: 29
Other (please specify)
15.25%
I don't know
24.81%
We do not notify residents of their proximity to a floodplain
20.93%
Sending digital notification (text, email) to affected residents
4.39%
Mailing notification to affected residents
8.53%
Posting FIRM Maps in public locations (e.g., city hall, county courthouse, library)
23.26%
Web-based flood maps
41.86%
0.00% 5.00% 10.00% 15.00% 20.00% 25.00% 30.00% 35.00% 40.00% 45.00%

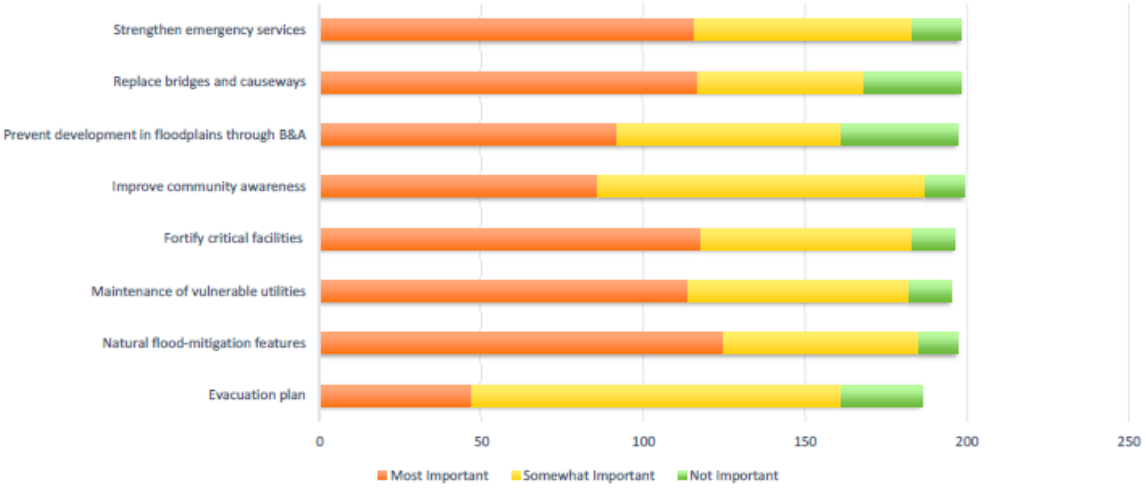
Q10: Taking into consideration your community's past experiences with natural hazards, please rate, on a scale from 1 to 4, your community's interested in pursuing the following activities:

Answered: 390 Skipped: 26



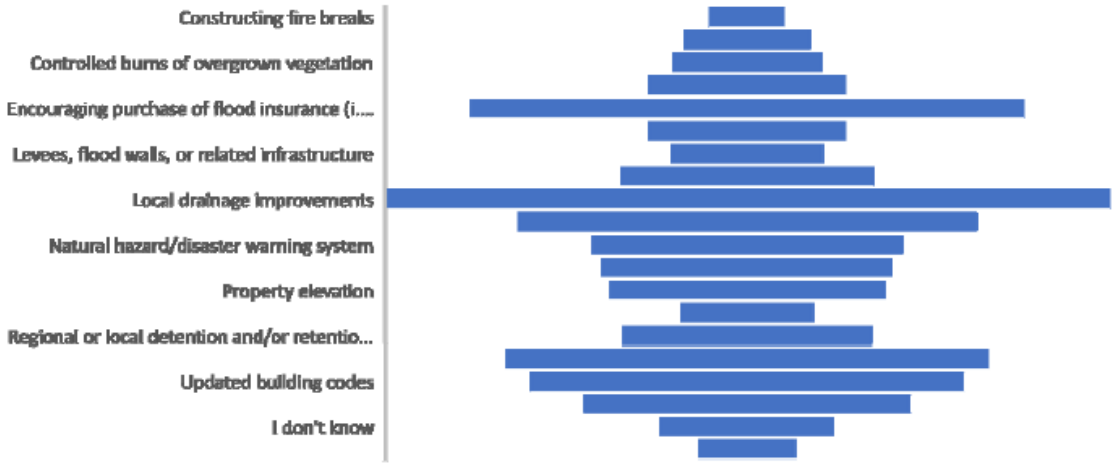
Q11: If additional, limited funding becomes available, please rate the following mitigation activities according to your community's current priorities:

Answered: 389 Skipped: 27



Q12: Which, if any, planning, mitigation, or protection activities has your community or jurisdiction implemented recently (i.e., in the past 5 years)? [Select all that apply]

Answered: 389 Skipped: 27

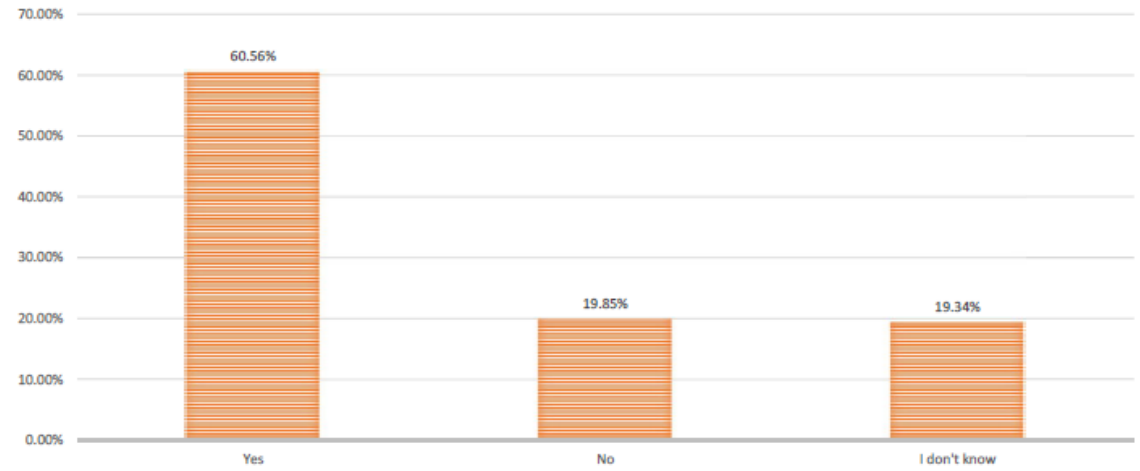


Q13: Which, if any, planning, mitigation, or protection activities has your community or jurisdiction identified as needed but not yet implemented? [Select all that apply]

Answered: 385 Skipped: 31

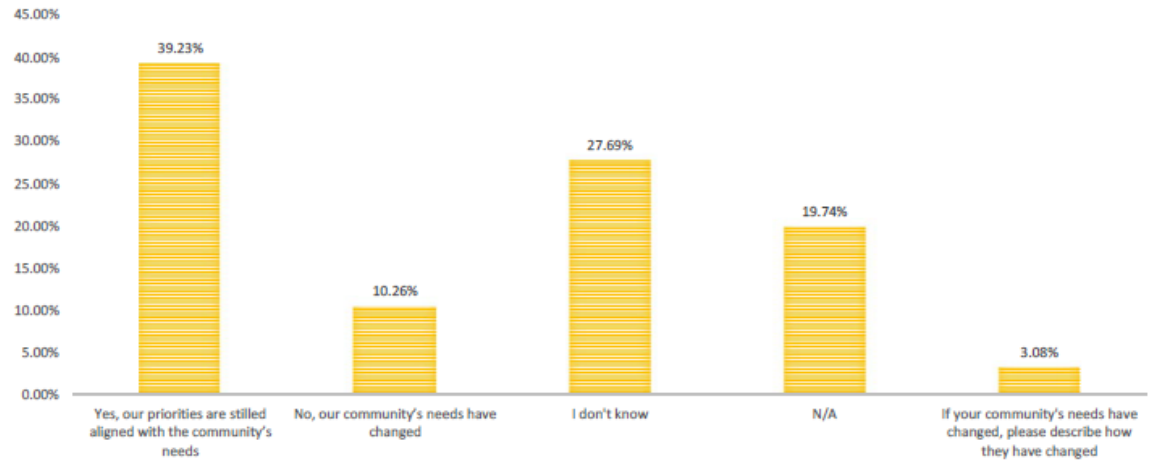
Q14: Are you currently, or have you in the past, coordinated with regional partners (neighboring communities and regional organizations such as councils of governments) to develop and implement hazard mitigation activities?

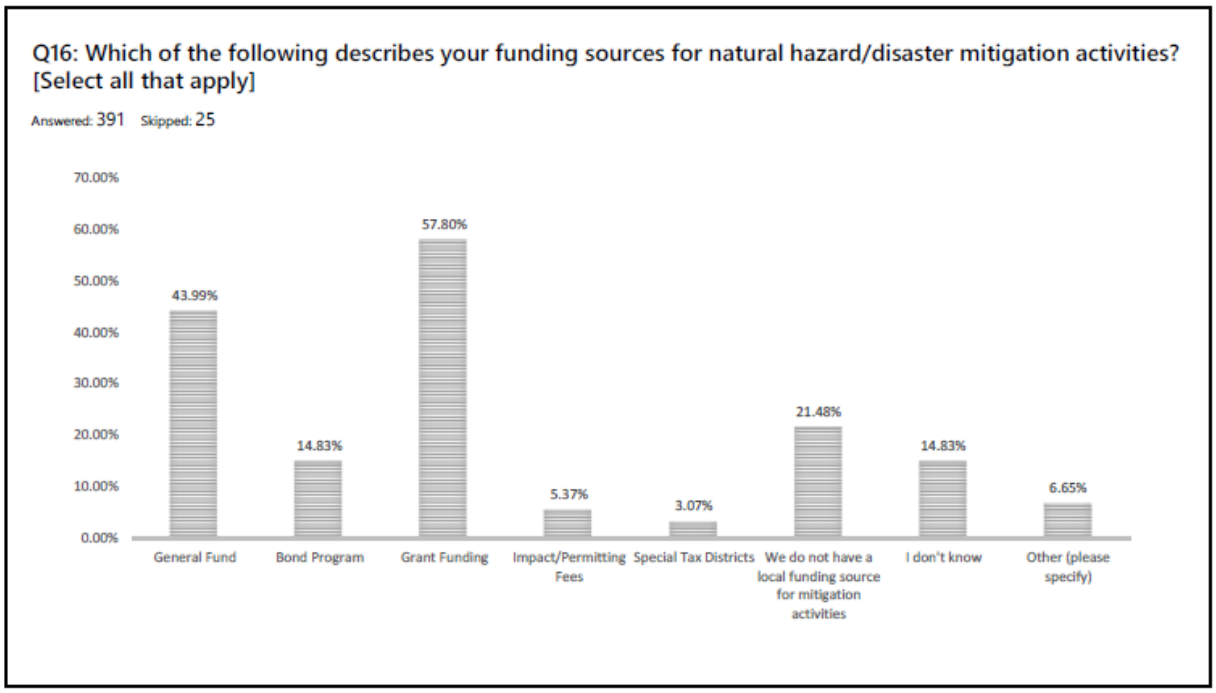
Answered: 393 Skipped: 23



Q15: If your Local Hazard Mitigation Plan was completed prior to your community experiencing flooding in 2015–2017, are your prioritized mitigation activities still aligned with your community's needs?

Answered: 390 Skipped: 26




Q16: Which of the following describes your funding sources for natural hazard/disaster mitigation activities? [Select all that apply]
Answered: 391 Skipped: 25
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
43.99%
14.83%
57.80%
5.37%
3.07%
21.48%
14.83%
6.65%
General Fund
Bond Program
Grant Funding
Impact/Permitting Fees
Special Tax Districts
We do not have a local funding source for mitigation activities
I don't know
Other (please specify)

6.4.2 CONSULTATIONS

Table 6-3: 2019 GLO Mitigation Outreach Efforts

Date	Meeting	Parties Represented	Purpose
1/7	CAPCOG Round Table	CAPCOG county and city officials	Discussed status of CDBG-DR programs and captured input on mitigation needs
1/9	State Agencies Program Discussion	FEMA, TDEM, TCEQ, TWDB, FEMA, SBA	Discussed status of CDBG-DR programs and captured input on mitigation needs
1/10	Jasper County	DETCOG counties	Discussed Hurricane Harvey Recovery
1/22	GCRPC	Various local officials	Discussed Hurricane Harvey progress and needs
1/22	Aransas County Brief	Various county and city officials	Discussed Hurricane Harvey progress and needs
1/30	Senate Finance Hearing	Members and public	Provided updates on Hurricane Harvey progress, funding, and timelines
2/1	Housing Work Group	Various members of the housing community	Provided updates on Hurricane Harvey progress, funding, and timelines
2/4	TRO Production Meeting	Federal and state agencies	Discussed Hurricane Harvey status, update on Mitigation funds
2/4	Elected Officials Call	County, city, state, and federal official	Hurricane Harvey Brief
2/7	Capitol Brief	Various state elected officials	Provided updates on Hurricane Harvey progress, funding, and timelines
2/12	Housing Appropriations	Various state elected officials	Provided updates on Hurricane Harvey progress, funding, and timelines
2/14	GLO 101	Various state elected officials	Provided updates on Hurricane Harvey progress, funding, and timelines
2/19	Texas Silver Jackets Call	USACE	Discussed role of Texas Silver Jackets, CDBG-MIT funding
2/20	USACE Call	USACE, TxDOT, GLO	Discussed TxFRAT and GLO programs
3/5	Texas State Mitigation Partners	FEMA, SHMO, TDEM, TWDB	Promoted upcoming mitigation grant, discussed HMGP and FMA
3/6	TWICC Meeting	TWDB, US EPA, TDA, TPUC, USACE, TRWA, USDA, Texas Secretary of State, TML, TCEQ	Discussed CDBG-MIT funding. need for outreach and communication across the state
3/7	HGAC Brief	Various county and city officials	Discussed Hurricane Harvey progress and needs
3/8	SETRPC Brief	Various county and city officials	Discussed Hurricane Harvey progress and needs
3/11	Senate Water & Rural Affairs Hearing	Various state elected officials	Provided updates on Hurricane Harvey progress, funding, and timelines

Date	Meeting	Parties Represented	Purpose
3/18	Senate Intergovernmental Affairs	Various state elected officials	Provided updates on Hurricane Harvey progress, funding, and timelines
3/25	Senate Intergovernmental Affairs	Various state elected officials	Provided updates on Hurricane Harvey progress, funding, and timelines
4/1	Elected Officials Call	County and city officials	Hurricane Harvey Brief
4/4	Security and Sustainability Forum	National Webinar	Provided insight and best practices of the GLO's programs tied to CDBG-DR and CDBG-MIT
4/8	Brazoria County	Various county and city officials	Hurricane Harvey Brief
4/8	Fort Bend & Galveston Counties Brief	Various county and city officials	Hurricane Harvey Brief
4/10	Disaster Recovery Managers - EDA Monthly Call	Disaster recovery managers from all Harvey impacted COGs, EDA	Updates on CDBG-MIT funding
4/11	Texas Recovery Interagency Project Funding Group (TRIP) Call	FEMA, TPW, THC, EDA, EDA-RD, TWDB, TDA, TDEM	Promoted awareness of upcoming mitigation grant, GLO mitigation survey, knowledge of HUD mitigation grant (timeline, allocation amounts per disaster)
4/15-4/18	Texas Emergency Management Conference	Representatives of local, regional, and state government	Promoted awareness of upcoming mitigation grant, GLO mitigation survey, knowledge of HUD mitigation grant (timeline, allocation amounts per disaster)
4/22	Global Match Working Group	Various state and federal officials	Hurricane Harvey Brief
4/24	AACOG Stakeholder Outreach	County judges, emergency management coordinators, and city administrators	Promoted awareness of upcoming mitigation grant, GLO mitigation survey, knowledge of HUD mitigation grant (timeline, allocation amounts per disaster)
4/24	GCRPC Stakeholder Outreach	County judges, emergency management coordinators, and city administrators	Promoted awareness of upcoming mitigation grant, GLO mitigation survey, knowledge of HUD mitigation grant (timeline, allocation amounts per disaster)
4/25	Senate Intergovernmental Affairs	Various state elected officials	Updates on Hurricane Harvey progress, funding, and timelines
4/25	UT Law School Land Use Conference	Land use attorneys at UT Law School	Discussed when and if to rebuild after disasters
4/25	DETCOG Stakeholder Outreach	County judges, emergency management coordinators, and city administrators	Promoted awareness of upcoming mitigation grant, GLO mitigation survey, knowledge of HUD mitigation grant (timeline, allocation amounts per disaster)
4/26	CBCG Stakeholder Outreach	County judges, emergency management coordinators, and city administrators	Promoted awareness of mitigation grant, discussed local current mitigation strategies

Date	Meeting	Parties Represented	Purpose
4/26	City of Houston	Housing and Community Development Department staff	Discussed upcoming mitigation grant
4/29-4/30	CHARM Workshop	Local community leaders from in around Refugio County	Presented on the upcoming CDBG-MIT Funds
5/1	CAPCOG Stakeholder Outreach	County judges, emergency management coordinators, and city administrators	Promoted awareness of mitigation grant, discussed local current mitigation strategies
5/1	Texas A&M Agricultural Extension	Service email to all counties in Texas	Promoted awareness of mitigation grant, discussed local current mitigation strategies
5/2	Email to Non-Harvey Impacted COG Executive Directors	Service email to all counties	Promoted awareness of mitigation grant, discussed local current mitigation strategies
5/3	ETCOG Conference Call	ETCOG staff, GLO-CDR Policy Development team	Promoted awareness of mitigation grant, discussed local current mitigation strategies
5/6	Elected Officials Call	County and city officials	Hurricane Harvey Brief
5/6	H-GAC Conference Call	HGAC staff, GLO-CDR Policy Development team	Promoted awareness of mitigation grant, discussed local current mitigation strategies
5/7	Cameron County Parks Department Call	Cameron County Parks staff (Joe Vega), GLO-CDR Policy Development team	Promoted awareness of mitigation grant, discussed local current mitigation strategies
5/7	SPAG Call	SPAG staff (Tommy Murillo), GLO-CDR Policy Development team	Promoted awareness of mitigation grant, discussed local current mitigation strategies
5/7	STDCCOG Conference Call	STDCCOG staff (Juan Rodriguez), GLO-CDR Policy Development team	Promoted awareness of mitigation grant, discussed local current mitigation strategies
5/8	BVCOG Stakeholder Outreach	County judges, emergency management coordinators, and city administrators	Promoted awareness of upcoming mitigation grant, GLO mitigation survey, knowledge of HUD mitigation grant-timeline, allocation amounts per disaster
5/9	HCTCOG Conference Call	HCTCOG homeland security and emergency management staff	Promoted awareness of upcoming mitigation grant, GLO mitigation survey, knowledge of HUD mitigation grant-timeline, allocation amounts per disaster
5/9	NCTCOG Conference Call	North Central Texas COG emergency preparedness supervisor	Answered questions regarding the upcoming mitigation grant and mitigation survey
5/10	PRPC Conference Call	PRPC homeland security coordinator and emergency management coordinator	Answered questions regarding the upcoming mitigation grant and mitigation survey

Date	Meeting	Parties Represented	Purpose
5/13	City of Roma Call	Representative from the City of Roma	Answered questions regarding the upcoming mitigation grant and mitigation survey
5/15	Texas Recovery Office Integrated Recovery Coordination Partner Call	Federal, state, and nonprofit staff and local officials	Promoted awareness of upcoming mitigation grant, GLO mitigation survey, knowledge of HUD mitigation grant-timeline, allocation amounts per disaster
5/15	SETRPC Stakeholder Outreach	Representatives of local governments - county judges, emergency management coordinators, and city administrators	Promoted awareness of upcoming mitigation grant, GLO mitigation survey, knowledge of HUD mitigation grant-timeline, allocation amounts per disaster
5/17	NCTCOG Call - Follow Up	Staff from the NCTCOG	Discussed information on CDBG-MIT funds and potential eligible activities
5/20-5/21	Harvey Readiness for Resilience Workshop	Community leaders, stakeholders, and technology partners	Discussed post-Harvey regional project directions and funding opportunities
5/21	HGAC Stakeholder Outreach	County judges, emergency management coordinators, and city administrators	Promoted awareness of upcoming mitigation grant, GLO mitigation survey, knowledge of HUD mitigation grant-timeline, allocation amounts per disaster
5/22	BVCCOG Stakeholder Outreach	Representatives of local governments within BVCOG service area including emergency management coordinators	Promoted awareness of upcoming mitigation grant, GLO mitigation survey, knowledge of HUD mitigation grant-timeline, allocation amounts per disaster
5/23	U.S. Green Building Council	Council Staff	Discussed resilience and disaster preparedness
5/23	CTCOG Stakeholder Outreach	County judges, emergency management coordinators, and city administrators	Promoted awareness of CDBG-MIT funding. participation in the GLO mitigation survey, GLO role in administering CDBG-DR grants
5/23	TWICC	TWDB, US EPA, TDA, TPUC, USACE, TRWA, USDA, Texas Secretary of State, TML, TCEQ	Presented on CDBG-MIT funding, provided emphasis on the need for outreach
5/21-5/24	UT Rio Grande Valley Stormwater Conference	Hidalgo, Cameron, and Willacy Counties	Discussed possible uses of CDBG-MIT funds
6/4	Texas Citizen Planner Workshop-Galveston County	Representatives from local governments in Galveston County, TAMU AgriLife staff	Promoted awareness of mitigation grant, participation in the mitigation survey, GLO-CDR role in administering CDBG-DR grants
6/6	TARC-Austin	Executive Directors of Texas Regional Councils	Promoted awareness of mitigation grant, participation in the mitigation survey, GLO-CDR role in administering CDBG-DR grants
6/7	Disaster Impact Task Force	Various state agencies, COGs, and local elected officials	Discussed possible uses of CDBG-MIT funds

Date	Meeting	Parties Represented	Purpose
6/12	Inaugural 2019 Interstate Summit	Representatives of state and local governments from Texas, Louisiana, Arkansas, and Mississippi	Participated in summit addressing flooding challenges across jurisdictions and align state efforts across state boundaries
6/14	Calhoun County Meeting	Various County and City officials	Discussed Hurricane Harvey progress and needs
6/19	USACE & InFRM Coordination	UT Center for Space Research, USACE, FEMA, USGS, NWS	Discussed state and regional planning efforts related to recovery and mitigation
6/24	EPA Urban Waters Harvey Resiliency Workshop	Representatives from state and local governments	Attended workshop on funding streams related to recovery and mitigation
6/27	Texas Citizen Planner Workshop - Rockport	Representatives from local governments - Aransas, Nueces, and San Patricio county area, TAMU AgriLife staff, CBCOG staff	Promoted awareness of CDBG-MIT funding. participation in the GLO mitigation survey, GLO role in administering CDBG-DR grants
6/27	Texas Citizen Planner Workshop - Cameron County	Representatives from local governments -Cameron county area, TAMU AgriLife staff, and other city and state agencies.	Promoted awareness of CDBG-MIT funding. participation in the GLO mitigation survey, GLO role in administering CDBG-DR grants
7/8	NCTCOG Mitigation Congressional Roundtable	NCTCOG, congressional representatives- North Central Texas Area, TWDB, TxDOT, HUD,	Discussed efforts being undertaken by North Central Texas regarding flood mitigation and presented on upcoming CDBG-MIT funding
7/8	Hidalgo and Cameron Counties	County Officials	Discussed flooding and possible uses of upcoming CDBG-DR and MIT funds
7/9	Readiness for Resiliency - Houston	Local governments – H-GAC, private sector entities, and Texas AgriLife staff	Promoted awareness of CDBG-MIT funding. participation in the GLO mitigation survey, GLO role in administering CDBG-DR grants
7/11	Readiness for Resiliency - Port Aransas	Representatives from local governments- Coastal Bend area, private sector entities, and Texas AgriLife staff	Promoted awareness of CDBG-MIT funding. participation in the GLO mitigation survey, GLO role in administering CDBG-DR grants
7/11	Interagency Coordination Meeting	TDA, TCEQ, TDEM, TPWD, TWDB, GLO	Discussed uses of multiple funding sources for flood mitigation
7/16	Capital Area Regional Flood Management Planning Workshop	CAPCOG, US EPA, FEMA, floodplain administrators	Presented on CDBG-MIT funding

Date	Meeting	Parties Represented	Purpose
7/16	BVCOG Economic Disaster Resiliency Workshop	Representatives from local governments, BVCOG staff, representatives from local and federal government	Promoted awareness of CDBG-MIT funding. participation in GLO mitigation survey, GLO role in administering CDBG-DR grants
7/17	TDEM/GLO Mitigation Meeting	TDEM and the GLO	Discussed alignment of CDBG-MIT funding and FEMA HMGP, PDM, and enhanced hazard mitigation plan
7/17	TRO Coordination Partner Call	FEMA, TPW, THC, UE EDA, US EDA - RD, TWDB, TDA, TDEM	Discussed recovery and mitigation efforts
7/18	GLO/ NPS Meeting	NPS, FEMA, and GLO	Discussed NPS's programs tied to recovery and mitigation in Texas
7/22	NCTCOG Transportation Director Meeting	NCTCOG and GLO	Discussed NCTCOG's flood planning efforts
7/23	FEMA Region 6 - Denton	FEMA, TDEM, and Non-Profit staff	Promoted awareness of CDBG-MIT funding, participation in GLO mitigation survey, GLO role in administering CDBG-DR grants
7/24	TWICC	TWDB, US EPA, TDA, TPUC, USACE, TRWA, USDA, Texas Secretary of State, TML, TCEQ	Presented on CDBG-MIT funding
8/6	LRGVDC Conference Call	LRGVDC Staff	Answered questions regarding upcoming mitigation grant and survey
8/8	Montgomery/ Galveston Counties	County and City Officials	Discussed upcoming mitigation funding opportunities
8/12	TIGR Training	2015 Floods, 2016 Floods, and Hurricane Harvey subrecipients	Discussed upcoming mitigation funding opportunities
8/13	State Mitigation Partners Summit	Various state agency officials	Discussed regional floodplain initiatives
8/21	Texas State Hazard Mitigation Team	SHMO, TDEM, TCEQ, Texas A&M Forest Service, Texas State Climatologist, and TWDB	Updates on CDBG-MIT funds, HMGP and BRIC update, state agencies updates, and Coastal Resiliency Plan
8/23	State Mitigation Partners Coordination Symposium	SHMO, TDEM, TWDB, and FEMA	Discussed state flood planning initiatives, mitigation programs, opportunities to maximize mitigation funding streams
8/26	Texas Hurricane Season Talk	General public	Facebook Live discussion on hurricane season in Texas: how to be ready, recover, and mitigation activities
8/26	Hurricane Harvey in Review	Coastal Bend Officials	Discussed Hurricane Harvey progress and needs
9-4/ 9-5	TAC Conference	Texas county officials and staff	Overview of CDBG-MIT Federal Register notice and rules and regulations

Date	Meeting	Parties Represented	Purpose
9/6	GLO-CDR Mitigation Webinar	Eligible communities, public housing authorities, flood and drainage districts, Indian tribes, private sector	Discussed CDBG-MIT notice and regulations tied to Texas allocation
9/10	FEMA Mitigation Bootcamp	FEMA and State Mitigation Coordinators	Presented on CDBG-MIT funding and Coastal Resiliency Master Plan
9/13	Meeting with Federal and State Agencies	Federal and state agencies active in disaster recovery and mitigation	Overview of the CDBG-MIT Federal Register notice, provided an overview of planning activities underway and proposed
9/16	Mitigation Planning Outreach	Federal and state agencies active in disaster recovery and mitigation	Overview of the CDBG-MIT Federal Register notice, provided an overview of planning activities underway and proposed
9/26	Mitigation Public Hearing-Austin	General public	Overview of CDBG-MIT Federal Register notice and rules and regulations, accepted oral and written public comments
10/1	Mitigation Public Hearing-Beaumont	General public	Overview of CDBG-MIT Federal Register notice and rules and regulations, accepted oral and written public comments
10/2	Mitigation Public Hearing- Corpus Christi	General public	Overview of CDBG-MIT Federal Register notice and rules and regulations, accepted oral and written public comments
10/4	Texas Municipal League	City officials and staff	Overview of CDBG-MIT Federal Register notice and rules and regulations, accepted oral and written public comments
10/9	Elected Officials Call	County, city, state, and federal officials	Hurricane Harvey and CDBG-MIT Brief
11/7	Interagency Mitigation Funding Group	SHMO, TDEM, TCEQ, Texas A&M Forest Service, and TWDB	Hurricane Harvey and CDBG-MIT Brief
11/13	Texas State Hazard Mitigation Team	SHMO, TDEM, TCEQ, Texas A&M Forest Service, Texas State Climatologist, and TWDB	Hurricane Harvey and CDBG-MIT Brief
11/19	HGAC Board of Directors Meeting	County and City Officials	Overview of CDBG-MIT Federal Register notice and rules and regulations, accepted oral and written public comments
11/21	COGs & TARC Conference Call	TARC and COG executive directors and staff	Overview of CDBG-MIT Action Plan
12/2	Mitigation Public Hearing - Rockport (Aransas County)	General public	Overview of CDBG-MIT Action Plan, accepted oral and written public comments
12/4	Texas Water Infrastructure Coordination Committee (TWICC)	TWDB, US EPA, TDA, TPUC, USACE, TRWA, USDA, Texas Secretary of State, TML, TCEQ	Overview of CDBG-MIT Action Plan
12/9	Mitigation Public Hearing - Dallas (Dallas County)	General public	Overview of CDBG-MIT Action Plan, accepted oral and written public comments

Date	Meeting	Parties Represented	Purpose
12/10	Mitigation Public Hearing - Weslaco (Hidalgo County)	General public	Overview of CDBG-MIT Action Plan, accepted oral and written public comments
12/11	Mitigation Public Hearing - Houston (Harris County)	General public	Overview of CDBG-MIT Action Plan, accepted oral and written public comments
12/17	Elected Officials Call	County, city, state, and federal officials	Hurricane Harvey and CDBG-MIT Brief
1/9/20	Mitigation Public Hearing - Jasper (Jasper County)	General public	Overview of CDBG-MIT Action Plan, accepted oral and written public comments

6.5 Appendix F: Regional Methods of Distribution

6.5.1 Council of Governments Method of Distribution Methodology

In order to determine the distribution funds for the COG MOD program for counties impacted by Hurricane Harvey, the GLO designed an allocation methodology that accounts for risks to natural hazards, social vulnerability, financial capacity, and population. These four factors form the basis for a weighted sum model that results in a final relative factor that determines the amount of funds to be allocated to each eligible county. Throughout this discussion it should be noted that HUD MID and State MID allocations are split, with 80 percent of funds going towards HUD MID areas, and 20 percent going to State MID areas; as a result, the calculations described below were performed separately for HUD MID and State MID areas. This section of the appendices explains the rationale for the use of each factor, the source of data for that factor, and the calculations performed to generate the MOD.

6.5.1.1 *Composite Disaster Index (CDI)*

As described in State Mitigation Needs Assessment, the CDI was developed by the Center for Space Research at UT Austin using seven different representations of historical data selected to document the distribution of natural hazard damage across Texas' 254 counties: (1) repetitive flood losses; (2) high winds from hurricanes; (3) wildfires; (4) major river flood crests; (5) tornadoes; (6) persistent drought conditions; and (7) hail. The CDI uses data from the years 2001 to 2018, which are likely to be of the highest accuracy and best represents the climatic conditions facing Texas today.

To create the CDI, a uniform method is applied to only the 140 eligible counties to represent the county-level data for each natural hazard category. For each hazard category (e.g., high winds from hurricanes, wildfires), the 14 counties that were impacted most frequently by that particular hazard are ranked in the top 10 percent, with the next 21 counties in the remainder of the top 25 percent. The following 69 counties fall in the midrange (25-75 percent) and experience an impact frequency that reflects the statewide average. The next 22 counties are occasionally affected and fall below the statewide average (bottom 25 percent), while the final 14 counties experience the least frequent impacts and form the bottom 10 percent. With this normalized ranking across the seven hazard categories complete, those rankings are then multiplied by a weighted factor used to represent the frequency and severity of the hazard type. The weights for each disaster type are:

Table 6-4: CDI Hazard Weights

Hazard Type	Weight Allocation
Repetitive Loss (NFIP) from Flooding	35%
Hurricane Winds	25%
Wildfire	15%
River Flood Crests	10%
Tornado	10%
Drought	3%
Hail	2%

This results in a composite score for each county that serves as the raw CDI factor included in the allocated methodology. This number was is normalized to represent a percentage of the total by dividing the county composite score by the sum of the composite score for all counties.

6.5.1.2 *Social Vulnerability Index (SoVI)*

The second factor in the allocation model is the Social Vulnerability Index. The Social Vulnerability Index (SoVI) measures the social vulnerability of counties across the United States—in particular, their vulnerability to environmental hazards. This index, developed by the University of South Carolina's Hazards & Vulnerability Research Institute, synthesizes 29 socioeconomic variables which contribute to reduction in a community's ability to prepare for, respond to, and recover from hazards. SoVI is a comparative metric that facilitates the examination of the differences in vulnerability among counties. SoVI shows where there is uneven capacity for disaster preparedness and response, and where resources might be used most effectively to reduce pre-existing vulnerability. The data sources for the development of SoVI come primarily from the United States Census Bureau. The SoVI data combines the best available data from both the 2010 U.S. Decennial Census and 5-year estimates from the American Community Survey (ACS).

Because SoVI scores can result in both a positive and negative number, the first step taken to utilize this number as a weighted factor is to turn all SoVI scores into positive numbers. This is accomplished by subtracting the lowest SoVI score of all counties (which is a negative number) from the SoVI score of a particular county, and then adding 1. This ensures that the lowest score in the range is at least 1. This positive SoVI is then normalized to represent a percentage of the total by dividing the county score by the sum of the score for all counties.

Figure 6-5: SoVI Factors[447]

VARIABLE	DESCRIPTION	SOCIAL VULNERABILITY CONCEPT
QCVLUN	Percent Civilian Unemployment	Employment Structure
QEXTRCT	Percent Employment in Extractive Industries	Employment Structure
QSERV	Percent Employment in Service Industry	Employment Structure
QFEMLBR	Percent Female Participation in Labor Force	Employment Structure
QRENTER	Percent Renters	Housing
QMOHO	Percent Mobile Homes	Housing
QUNOCCHU	Percent Unoccupied Housing Units	Housing
QAGEDEP	Percent Population under 5 years or 65 and over	Population structure
QFAM	Percent of Children Living in 2-parent families	Population structure
MEDAGE	Median Age	Population structure
QFEMALE	Percent Female	Population structure
QFHH	Percent Female Headed Households	Population structure
PPUNIT	People per Unit	Population structure
QASIAN	Percent Asian	Race/Ethnicity
QBLACK	Percent Black	Race/Ethnicity
QSPANISH	Percent Hispanic	Race/Ethnicity
QINDIAN	Percent Native American	Race/Ethnicity
QPOVTY	Percent Poverty	Socioeconomic Status
QRICH	Percent Households Earning over $200,000 annually	Socioeconomic Status
PERCAP	Per Capita Income	Socioeconomic Status
QED12LES	Percent with Less than 12th Grade Education	Socioeconomic Status
MDHSEVAL	Median Housing Value	Socioeconomic Status
MDGRENT	Median Gross Rent	Socioeconomic Status
QRENTBURDEN	% of households spending more than 40% of their income on housing expenses	Socioeconomic Status
QSSBEN	Percent Households Receiving Social Security Benefits	Special Needs

[447] Susan L. Cutter and Christopher T. Emrich, "Social Vulnerability Index (SoVI®): Methodology and Limitations," https://nationalriskindex-test.fema.gov/Content/StaticDocuments/PDF/SoVI%20Primer.pdf

QESL	Percent Speaking English as a Second Language with Limited English Proficiency	Special Needs
QNRRES	Nursing Home Residents Per Capita	Special Needs
QNOHLTH	Percent of population without health insurance	Special Needs
QNOAUTO	Percent of Housing Units with No Car	Special Needs

6.5.1.3 *Financial Capacity (Per Capita Market Value)*

The third factor in the allocation model is Per Capita Market Value (PCMV) which is utilized as a proxy to gauge the financial capacity of a unit of local government to generate revenue to fund its operations and capital expenditures. To calculate per capita market value, GLO obtained the tax levy data set for all counties in Texas for 2018 from the State Comptroller's Office. This dataset includes the market value of all properties in every county in Texas, along with the taxable value of land and effective tax rates. Population data for each county from the most recently available American Community Survey is included and used to generate the per capita market value—the market value of all property in a county divided by the county population. Because the purpose of the PCMV is to give greater weight to areas with lower financial capacity, and thus lower PCMV, the model turns the straight PCMV into a relative factor, which is accomplished by dividing the sum of all the PCMV for every county by the PCMV for the particular county; the smaller the PCMV the larger the factor. This number is then normalized to represent a percentage of the total by dividing the county factor score by the sum of the factor for all counties.

6.5.1.4 *County Population*

The final factor for the allocation model is county population which was obtained from the U.S Census Bureau's most recent American Communities Survey data. As with the other factors, the population is normalized to represent a percentage of the total by dividing the county population by the sum of the population for all considered counties.

6.5.1.5 *Allocation Model Weights*

These four factors are then each given a weight—30 percent for the CDI, 30 percent for SoVI, 20 percent for PCMV, and 20 percent for population—that is multiplied by the respective score for each county and each factor to create a Combined Adjustment Factor (CAF). The CAF is then multiplied by the total program amount—having already split the counties into HUD MID and State MID allocations that split the program amount 80 percent to 20 percent—to arrive at the final allocation for the respective county.

The county values are then grouped by Council of Government and rounded to the nearest $1,000 to arrive at the COG MOD allocation.

6.6 Appendix G: Public Comment – State of Texas

State of Texas CDBG Mitigation Action Plan: Public Comments

The State of Texas CDBG Mitigation Action Plan (the Action Plan) was released on November 21, 2019. The public comment period was from November 22, 2019, to January 6, 2020. The Action Plan was posted on both the GLO's main website and its recovery website. A GLO press release announcing publication of the Action Plan for public comment was sent out to 6,157 recipients across 140 eligible counties, targeting local emergency management coordinators, county and local government officials, public housing authorities, Indian tribes, and other interested parties.

The public comment period was extended to January 10, 2020; a GLO press release announcing the extension was posted on both websites and sent out to the same 6,157 recipients.

The following table is an alphabetical list of individuals and organizations that submitted public comments on the Action Plan by letter, email, or through speaking at one of the GLO's eight public hearings:

Table 6-5: Commenters

ame		Individual, County, City or Organization
Last	**First**	
Abazajian	Katya	Private Individual
Abeny	Mayor Kerry	City of Nome
Abert	Jackie	Private Individual
Abodeely	John	Chief Executive Officer, Houston Arts Alliance
Abraham	Yael	Private Individual
Abu Sharekh	Khalil	Private Individual
Adcock	Michelle	Private Individual
Adler	Wendy	Private Individual
Aguilar	L.	Houston Stronger
Aguilar	Melba	Houston Stronger
Ahmed	Rehman	Private Individual
Alcorn	Sallie	Councilmember, City of Houston
Allen	The Honorable Judge Mark	Jasper County
Alvarado	State Senator Carol	Texas Senate
Alvarez	Choky	Private Individual
Alvarez	Rosie	Houston Stronger

ame		Individual, County, City or Organization
Last	First	
Ananya	Bhattacharya	Private Individual
Anderson	Jennifer	Private Individual
Anderson	Patty	Private Individual
Anderson	Callina	Private Individual
Anderson	Lauren	Houston Ballet
Anderson	Emily	Municipal Services Manager, Halff Associates
Annis	Ksenia	Private Individual
Archer	Darwin	City Manager, City of Cisco
Artis	Shawn	Private Individual
Asbury	Reese	Houston Stronger
Ashraf	Babur	Houston Stronger
Babbitt	Salli	Private Individual
Bailey	Ann	Private Individual
Baines	Sherrill	Private Individual
Baker	Jay	Houston Stronger
Baker	Shirley	Houston Stronger
Bakko	Sally	Legislative Coordinator, City of Galveston
Balaban	Susan	Private Individual
Ballas	Freda	Private Individual
Barndollar	Carol	Houston Stronger
Barnes	Michelle	Private Individual
Barnhart	Peter	Houston Stronger
Barrett	Keith	Harbormaster, Aransas County Navigation District
Barrett	Sherri	Houston Stronger
Baskin	Eva	Private Individual
Baskshi-Rami	Anjali	Private Individual
Bass	Natascha	Houston Stronger
Batterson	Kelly	Private Individual
Bauhs	Robert	Private Individual
Beard	John	Chairman, Port Arthur Community Action Network
Beaumont	Lily	Private Individual
Beavers	Nancy	Private Individual
Beckles	Loris	Private Individual

ame		Individual, County, City or Organization
Last	First	
Beckman	Kendall	Houston Stronger
Beer	Christopher	Private Individual
Beever	Susan	Private Individual
Bell	Charles	Private Individual
Bennett	Mayor Cathy	City of Ivanhoe
Bentley	William	Private Individual
Berger	Karen	Private Individual
Berlin	Le	Private Individual
Bernhardt	Sarah	President and CEO, Bayou Preservation Association
Bertrand	Jami	Houston Stronger
Bethwolff	Julie	Houston Stronger
Betty	Cox	Private Individual
Binford	LeAnn	Private Individual
Birdwell	Wes	Deputy Executive Director, Texas Floodplain Management Association
Black	Ezra	Private Individual
Blair	Jeffrey	Private Individual
Blanchette	The Honorable Judge Jacques	Tyler County
Blumenfeld	Erika	Private Individual
Bobek	Gabriel	Private Individual
Boemer	Cory	Director of Philanthropy, HALO-Flight, Inc.
Bogard	Allen	City Manager, City of Sugar Land
Bone	Miki	Private Individual
Bossarte	Denise	Private Individual
Bowling	Beth	Private Individual
Boyd	Connie	Private Individual
Brabham	Lorraine	Private Individual
Bradshaw	Kristy J.	Private Individual
Branch	Keri	Private Individual
Brandt	Anthony K.	The Shepard School of Music
Brangwen	Michele	Houston Stronger
Branick	The Honorable Judge Jeff	Jefferson County
Branson	Robert	Private Individual
Brant	Daniel	Private Individual

ame		Individual, County, City or Organization
Last	First	
Bray	Bridget	Asia Society
Breakfield	Sandra	Private Individual
Brennecke	Paula	Private Individual
Briggs	Brenda	Houston Stronger
Brinkman	Thomas	Private Individual
Briones	Francisco	Resources Mobility Associates, Inc.
Brombacher	Mike	Houston Stronger
Brookman	Bari	Private Individual
Brooks	Scott	Houston Stronger
Brown	Beth	Uptown Dance Center
Brummer	Carrie	Private Individual
Buraimoh	Lanre	Private Individual
Burdick	Emily	Special Advisor, United States Department of Energy
Burke	Shanna	Executive Director, South East Texas Regional Planning Commission
Burkeholder	Susanne	Private Individual
Burnam	Lon	Tarrant Coalition for Environmental Awareness
Burrell	Brandon	Private Individual
Burton	Amber	Houston Stronger
Buscha	Tim	Houston Stronger
Bush	David	Preservation Houston
Byrd	Barbara	Houston Stronger
Cagle	Commissioner Jack	Harris County
Cain	Randy	Alderman, Ingleside on the Bay
Callegari	Bill	Houston Stronger
Camfield	Bill	Rice University
Campbell	Auggie	Houston Stronger
Canales	The Honorable Judge Barbara	Nueces County
Cano	Josalyn J.	Houston Stronger
Cantu	Roel	Private Individual
Caraway	Kippy	Houston Stronger
Cardwell	Paul	Private Individual
Carona	Don	Orange County Drainage District
Carrie	Sanger	Private Individual

ame		Individual, County, City or Organization
Last	First	
Carter	Rhealyn	Dallas Theatre Center
Casco	Jorge	Private Individual
Casteel	Jessie	Private Individual
Catala	Pierra	Private Individual
Catillo	Jimmy	Private Individual
Chambers	Joleen	Private Individual
Chambers	Anthony	Houston Stronger
Chaney	Deborah Winters	Houston Stronger
Chaney	Justin	Houston Stronger
Chapman	Cindy	Westbury Civic Club
Chatham	Donna	Langford Community Management Services
Cheney	Commissioner Jack	Aransas County
Chin	Charles	Houston Stronger
Choate	Michael	Director, Texas Water Programs, National Wildlife Federation
Clark	Jan	City Administrator, City of Rising Star
Clarke	Carole	Private Individual
Cleveland	John	Private Individual
Cloud	Lisa	Houston Stronger
Cobb	Calvin	Private Individual
Coco	Lane	Houston Choral Society
Cole	Emily	Private Individual
Coleman	State Representative Garnet	Texas House of Representatives
Coleman	Mike	Private Individual
Colesio	Sigrid	Houston Stronger
Collier	Carol	Private Individual
Collins	Kristi	Private Individual
Collins	Jeff	Private Individual
Commanday	Elisabeth	Private Individual
Cook	Catherine	Private Individual
Cook	Chloe	Private Individual
Cope	Peggy	Private Individual
Cope	Denys	Private Individual
Corbin	David	Private Individual
Cosey	Ava	Private Individual

ame		Individual, County, City or Organization
Last	First	
Costa	James	Private Individual
Costello	Stephen	Chief Recovery Officer, City of Houston
Cox	Peter	Private Individual
Cox	Michael	Houston Stronger
Cox	Cece	Community Center
Creekmore	Clayton	Private Individual
Crenshaw	Congressman Dan	Congress of the United States House of Representatives
Cross	James	Private Individual
Crout	Steve	Director of Policy and Resilience Programs, Smart Cities Council
Crum	Ashley	Houston Stronger
Cubias	Roxana	Houston Stronger
Curless	Orulia	GrantWorks, Inc.
Curtiss	Marilyn	Houston Stronger
Cyriac	Ron	Houston Stronger
Czarnik	Amanda	Private Individual
Dambeck	Jim	Houston Stronger
David	Rrenee	Private Individual
Davidson	Marshall	Private Individual
Davidson	Kathryn	Private Individual
Davidson	Robin	Private Individual
Davila	Gabriel	Private Individual
Davis	Andrew	Private Individual
Davis	Laura	Houston Stronger
Davis	State Representative Sarah	Texas House of Representatives
Davis	Andrew	Dean and Professor of Music, University of Houston
de Bont	Tracy	Private Individual
de la Reza	Rey	Private Individual
Dean	Misty	Houston Stronger
Debananda	Pati	Private Individual
DeBarbieris	Kathleen	Houston Stronger
Decker	Jennifer	Private Individual
DeHay	Kelly	Houston Stronger

ame		Individual, County, City or Organization
Last	First	
Delaney	Janet	Private Individual
Delavan	Mary	Private Individual
Delgado	Nelson	Private Individual
Deller	Jeanne	Private Individual
DeMerchant	Commissioner Ken	Fort Bend County
DeStefano	James	Houston Stronger
Devshi	Saleem	Houston Stronger
Dias	Maria Susana	Private Individual
Dickens	Kyle	Houston Stronger
Dickson	Rachel	Private Individual
Dieckow	Malcolm	Chairman, Aransas County Navigation District
Dinkins	Samuel	Dinky Drum
DiSaggio	Alexander	Houston Stronger
Douglas	Davis	County Engineer, Liberty County
Drew	Zenetta	Private Individual
Driver	James	Private Individual
Drum	Jordan	Society for the Performing Arts
Dunaway	Catherine	4th Wall Theater
Duncan	Sylvia	Private Individual
Dusek	Tim	GBRA
Duterroil	Dana	Private Individual
Edge	Bill	Houston Stronger
Edwards	Brittany	Houston Arts Alliance
Egan	Caroline	Disaster Recovery Manager, Fort Bend County
Egbune	Cheche	Private Individual
Ellis	Commissioner Rodney	Harris County
Ellis	Marilu	Private Individual
Enlow	Cynthia	Private Individual
Epstein	Kelly	Private Individual
Ermis	James	Private Individual
Escobar	Enrique	Houston Stronger
Espinoza	Melissa	Private Individual
Espinoza	John	President, Texas Floodplain Management Association
Esquivel	Roberto	Private Individual

ame		Individual, County, City or Organization
Last	First	
Eubank	Drew	Private Individual
Evans	Amy	Private Individual
Evans	James	Private Individual
Evans	Pam	Private Individual
Evans	Will	Private Individual
Fails	Amanda	Houston Stronger
Fain	Jeremy	Houston Stronger
Faithfull	Mary	Executive Director, Disability Rights Texas
Fenenbock	Lauren	Private Individual
Ferguson	Judith	Private Individual
Fernandez	Rachael	Private Individual
Fernandez	Belinda	Houston Stronger
Ferrio	Elizabeth	Private Individual
Fiedler	Ed	Private Individual
Fields	The Honorable Judge Rex	Eastland County
Fincham	Joni	Private Individual
Finnell	Chuck	Houston Stronger
Fisher	Denise	Private Individual
Fisher	James	City Manager, City of Brenham
Fitzgerald	Marquita	Private Individual
Fletcher	Congresswoman Lizzie	Congress of the United States House of Representatives
Flores	Juan	Private Individual
Flowers	Lance	Private Individual
Fly	Carol	Private Individual
Fontaine	Carroll	Houston Stronger
Ford	Inge	Bike Houston
Ford	Laurie	Houston Stronger
Ford	T.	Houston Stronger
Fortescue	Ann	Private Individual
Foster	David	Texas Director, Clean Water Action
Foster	Luke	Private Individual
Fowler	Perry	Executive Director, Texas Water Infrastructure Network
Fox	Stephen	Rice University

ame		Individual, County, City or Organization
Last	First	
Frank	Danny	Houston Stronger
Franklin	Kam	Private Individual
Frazier	Chanelle Nicole	Houston Arts Alliance
Freeman	Laura	Private Individual
Friend	Patrick	Houston Stronger
Fuentes	Commissioner David	Hidalgo County
Fullerton	Vicki	Houston Stronger
Furst	Nancy	Houston Stronger
Gaber	Hilary	Private Individual
Gafrick	Marlene	Private Individual
Galindo	Jim	Private Individual
Galindo	Sally	Private Individual
Gallagher	Briana	San Jacinto River Authority
Garcia	Erik	Private Individual
Garcia	Commissioner Adrian	Harris County
Garden	Yvette	Private Individual
Garelick	Nicholas	Private Individual
Garza	Sylvia	Houston Stronger
Garza	Diane	Director of Business Development, HALO-Flight, Inc.
Garza	Pilar	Houston Stronger
Garza	Ron	Lower Rio Grande Valley Development Council
Gayo	Loyce	Private Individual
Gehlert	Edgar	Private Individual
Gell	Christi	Private Individual
Gentry	Daniel	Houston Stronger
Giannelli	Christina	Private Individual
Gibbs	Gary	Executive Director, Texas Commission on the Arts
Gibbs	Amy	ROCO
Gilbert	Claudia	Houston Stronger
Gillespie	Larry	Ingleside on the Bay
Gillson	Eileene	Private Individual
Gladden	Dean	Alley Theatre
Godwin	Joyce	Houston Stronger
Gogolewski	John	Private Individual

ame		Individual, County, City or Organization
Last	First	
Golden	Carol	Houston Stronger
Goldman	Joseph	Private Individual
Gomez	Cynthia	Houston Stronger
Gonzales	Augusto	Cameron County
Gonzalez	Richard	San Patricio County
Gonzalez	Margie H.	Jim Wells County
Gonzalez	Marisa	Private Individual
Gonzalez	Marcos	Private Individual
Gonzalez	Jose Carlos	Gonzalez & Associates Consulting
Gonzalez	Louis	Luna Art Works
Gonzalez	Sandra	Houston Stronger
Gonzalez	Delia Iris	Executive Director, Coalition for Environment, Equity and Resilience
Goodall	Fred	Private Individual
Goodwyn	Kahlil	Private Individual
Gorak	Martha	Private Individual
Goshen	Danielle	Water Policy and Outreach Specialist, Galveston Bay Foundation
Gothia	The Honorable Judge John	Orange County
Greene	Alison	Private Individual
Greenstein	Rob	Private Individual
Greenwood	Judy	Private Individual
Gregory	Diane Griffin	Private Individual
Griffin	Yvonne	City of La Vernia
Griffin	Gregory Diane	Private Individual
Grimm	Carol	Private Individual
Griswold	Dean	Private Individual
Grootendorst	Edward	Private Individual
Grzelak	Carrie	Private Individual
Gupta	Rashmi	Houston Stronger
Gwyn	Johnathan	Private Individual
Ha	Phuong	Private Individual
Habersang	Rolf	Private Individual
Hablinski	Chad	Houston Stronger
Haddock	Ian L.	Private Individual
Hadnot	Kristie	City of Huntsville

ame		Individual, County, City or Organization
Last	First	
Haeggquist	Brad	Mauriceville MUD
Hafner	Joe	Private Individual
Hailey	Jacqueline	New Hope Baptist Church
Hainley	Lauren	Program Manager, Disaster Services, Houston Arts Alliance
Hall	Barbara	Private Individual
Halligan	Marcia	Private Individual
Halloran	Michael	Private Individual
Hamadanian	Hamid	Houston Stronger
Han	Terry	Shakespeare Dallas
Hancock	Carolyn	Private Individual
Hannan	Jim	Private Individual
Hansen	Yvonne	Private Individual
Hardy	Joel	City of Pearland
Harlan	Jing	Houston Stronger
Harlib	Amy	Private Individual
Harmon	Lucy	Private Individual
Harn	Samantha	Halff Associates
Harper-Smith	Pamela	Private Individual
Harrington	Sarah	Houston Stronger
Harris	Judy	Private Individual
Harris	Teague	IDS Engineering Group
Harris	Roberta	Private Individual
Harris	Linda	Houston Stronger
Hartgrove	Suzy	Houston Stronger
Hartzell	Eric	Executive Vice President, GrantWorks, Inc.
Harvey	Bob	President and CEO, Greater Houston Partnership
Hattman	Elizabeth	Private Individual
Hebert	A. Keith	Houston Stronger
Heckmann	Duane	Land Advisors Organization
Hedtke	The Honorable Judge Wade J.	Karnes County
Hegemier	Tom	Doucet & Associates
Heinbaugh	Chris	AT&T Preforming Arts Center
Heithaus	Melissa	Private Individual

ame		Individual, County, City or Organization
Last	First	
Henderson	Sara	Private Individual
Hendry	Dawn	Private Individual
Henry	The Honorable Judge Mark	Galveston County
Henry	Amy	Private Individual
Henry	Rene	Private Individual
Herdeman	Madeline	Private Individual
Hernandez	State Representative Ana	Texas House of Representatives
Hidalgo	The Honorable Judge Lina	Harris County
Hild	Harvey	Private Individual
Hilliard	Jennifer	City of Ingleside on the Bay
Hines	Jamie	Private Individual
Ho	Jessica	Chamber Music International
Hodgins	Danielle	Private Individual
Hofer	Marilynn	Private Individual
Hoffman	Donna	Private Individual
Hofland	Amy Lewis	Crow Museum of the Arts
Hogue	WL	University of Houston
Holcomb	Lisa	Private Individual
Hollman	Mary Elizabeth	Private Individual
Horak-Brown	Joy	New Hope Housing
Hornsey	Erika	Houston Community ToolBank
Howard	John M.	Private Individual
Hoyt	Sharon	Private Individual
Hu	Diana	Houston Stronger
Huberty	State Representative Dan	Texas House of Representatives
Huerta	Joel	Private Individual
Huffman	State Senator Joan	Texas Senate
Hull	Mayor Corey	City of Carbon
Hull	Walter	U.S. Dream Academy
Hunt	Lonnie	Deep East Texas Council of Governments
Hunter	Sheryl	Houston Stronger
Hurley	The Honorable Judge Robert	Atascosa County
Hutchings	Lee	Private Individual

ame		Individual, County, City or Organization
Last	First	
Ibrahim	Tamiya	Houston Stronger
Indermuehle	Larry	Houston Stronger
Irvin	Necole	Private Individual
Isom	John	Houston Stronger
Jackson	The Honorable Judge Richard	Wilson County
Jackson	John P.	Private Individual
Jackson	Charlie	Private Individual
Jackson	Tiffany	Bishop Arts Theatre Center
Jaes	Sarah	Private Individual
Jalomo	Augustine	Dallas Area Cultural Advocacy Coalition
Jambulapati	Sudershan	Houston Stronger
Jamil	Ather	Private Individual
January-Bevers	Deborah	Houston Stronger
Jevric	Virginia	Private Individual
Job	Trey	Assistant City Manager, City of Bastrop
Johnson	Alan A.	Civil Engineer, FEMA
Johnson	Karl	Private Individual
Johnson	Julie	Private Individual
Johnson	Jonna	Private Individual
Johnson	Patrina	Private Individual
Johnson	Sis	Private Individual
Johnson	Kevin	Houston Stronger
Johnson	Cone	Art Conspiracy
Johnson	Tim	Kitchen Dog Theater
Johnson	Don	Private Individual
Johnson	State Representative Jarvis	Texas House of Representatives
Jones	Sandy	Private Individual
Jones	Bob	Houston Stronger
Jones	Shamika	Houston Stronger
Jones-Hospod	Kathy	Private Individual
Joseph	Marjorie	Private Individual
Jou	Earl	Houston Stronger
Kaminsky	John	City Manager, City of Victoria

ame		Individual, County, City or Organization
Last	First	
Kanayan	Alice	Private Individual
Karcher	Mary	Private Individual
Kasten	Nancy	Private Individual
Kaushik	Kimber	Private Individual
Kavanaugh	Michael	Private Individual
Keane	John	Houston Stronger
Kelley	Charis	Art Works Unlimited
Kellman	Steven	Private Individual
Kellner	Sara	Private Individual
Kenah	JD Emmanuel	Private Individual
Kendrick	Mayor Jimmy	City of Fulton
Kennedy	CD	Private Individual
Killam	Joseph	Houston Arts Alliance
Klassen	Tom	HALO-Flight, Inc.
Kolkhorst	State Senator Lois	Texas Senate
Kosterich	Jeffrey	Private Individual
Krumrein	John	Private Individual
Kubo	Mat	Houston Arts Alliance
Kumar	Rathna	Private Individual
Kurt	Jane	Private Individual
Kvande	Marta	Private Individual
LaCour	Lance	President/CEO, Katy Area Economic Development Council
LaFavers	Shawn	Private Individual
Lake	David	Private Individual
Lance	Cindy	Private Individual
Langford	Judy	LCMS Consulting
Langley	Ashley	Private Individual
Langley	Suzanne	Executive Director, Audubon Texas
Lawal	Eileen	Private Individual
Lawrence	Dean	Metrostudy/Hanley Wood Co.
Lawrence	Charlotte	Private Individual
Leal	Kristina	Halff Associates
Leal, Jr.	Mayor Willie	City of Poteet
LeBlanc	Lisa	Private Individual
LeBlanc	Renee	Private Individual
Lee	Erica	Private Individual

ame		Individual, County, City or Organization
Last	First	
Lee	Janisse	Houston Stronger
Lemarier	Christine	Private Individual
Lemberger	Josef	Private Individual
Lemelle	Daphne	Executive Director, Community Services Department, Harris County
Lentz	Greg	Masterson Advisors LLC
Lessnau	Klaus	Private Individual
L'Eveille	Alexandre	Private Individual
Levine	Rhoda	Private Individual
Levine	Justin	Houston Stronger
Levy	Rich	Private Individual
Lewis	Clara	Private Individual
Lewis	Jennifer P.	Private Individual
Li	Jessie	City Engineer, City of Sugar Land
Liebl	Denise	Private Individual
Lipchak	Oscarv	Private Individual
Liu	Jack	Liuxon
Liu	Ella	Houston Stronger
Lobell	Joan	Private Individual
Loftness	Kim	Private Individual
Logan	T.	Private Individual
Loney	Lauren	Staff Attorney, Advocacy co-director, Texas Housers
Longford	Nicola	Private Individual
Loomis	Evan	ICON
Louis	Kenny	Private Individual
Lozano	Donna	Private Individual
Luisa	Duarte	Private Individual
Lynn	Sandra	Private Individual
Macha	Jordan	Executive Director, Bayou City Waterkeeper
MacLean	Nancy	Houston Stronger
Mannchen	Brandt	Chair, Houston Regional Group, Sierra Club
Mansour	Amira	Private Individual
Manuel	Virginia	Private Individual
Marine	Deborah	Sammons Center for the Art

ame		Individual, County, City or Organization
Last	First	
Marquardt	David	Private Individual
Marshall	L.	Private Individual
Martin	Joe	Private Individual
Martin	Randall	Houston Stronger
Martinez	Mario	Aransas County Navigation District
Martinez	Karen	Private Individual
Martinez	Emily	Regional Disaster Recovery Manager, Coastal Bend Council of Governments
Marvin	Edith	Director of Environment & Development, North Central Texas Council of Governments
Mason	Jessica	EMC, Tarrant County
Massey	Betty	Private Individual
Massey	Heidi	Houston Stronger
Masten-Cain	Kathryn	Chair, Planning & Zoning Commission, Ingleside on the Bay
Masterson	Dorothy	Museum of Geometric and MADI Art
Matson	Catherine	Chair, Planning and Zoning Commission, Ingleside on the Bay
Matusoff	Cathy	Private Individual
Maxwell	Brian A.	City Manager, City of Galveston
McAdams	Jake	Public Management, Inc.
McAdams	Jake	Public Management Incorporated
McAlister	Todd	Executive Director, South-central Partnership for Energy Efficiency as a Resource
McClurg	Tom	Vice Chair, Jasper County Regional Action Agency
McComb	Mayor Joe	City of Corpus Christi
McCord	Leisa	Private Individual
McCord	Carolina	Houston Stronger
McCurdy	Pamela	Private Individual
Mcdevitt	Linda	Private Individual
McGinty	Shanna	Houston Stronger
McGowan	LJ	Houston Stronger
McGuire	Karen	Private Individual
McNally	Dylan	Private Individual

ame		Individual, County, City or Organization
Last	First	
Meadows	Joel	Houston Stronger
Meckley	Mary Ellen	Private Individual
Mediwala	Sanjay	Private Individual
Mehta	Ami	Private Individual
Melendrez	George	Private Individual
Melhado	Gail	Private Individual
Mendoza	Bernard	Private Individual
Mendoza	Norma	Private Individual
Mettenbrink	Mary Curry	Young Audiences of Houston
Metz	Susan	Private Individual
Metzger	Luke	Executive Director, Environment Texas
Meyer	Ari	Private Individual
Meyer	Kimberly	Private Individual
Meyer	Lee Allen	Private Individual
Meyers	Commissioner Andy	Fort Bend County
Middlebrooks	Jane	Houston Stronger
Mikulencak	Steven	Extension Program Specialist, Texas Community Watershed Partners, Texas A&M Agrilife Extension Service
Milam	Nick	Private Individual
Miles	State Senator Borris	Texas Senate
Millensifer	Aimee	Private Individual
Miller	Hannah	Rockport Cultural Arts District
Miller	State Representative Rick	Texas House of Representatives
Mills	Dave	Private Individual
Mills, Jr.	The Honorable Judge C.H. "Burt"	Aransas County
Mira	Susannah	Private Individual
Miranda	Ruby	Houston Stronger
Miridis	Ellen	Houston Stronger
Mirza	Nick	Houston Stronger
Missner	Michele	Private Individual
Moczygemba	Walter	Private Individual
Moen	Syd	Private Individual
Moglovkin	Brena	Houston Stronger
Molina	Mick	Private Individual

ame		Individual, County, City or Organization
Last	First	
Molina	Rony	Houston Stronger
Montgomery	Jessie	Perot Museum
Montoya	Delilah	Private Individual
Moody	John	Private Individual
Moore	Robert	Director, Water & Climate Team, Natural Resources Defense Council
Moore	Linda	Private Individual
Moore	Courtney	Private Individual
Moore	Denise	Houston Stronger
Moorehead	Scott	Policy Director, Audubon Texas
Morales	Julie	Houston Stronger
Morales	Commissioner Vincent	Fort Bend County
Morgan	Dan	Private Individual
Morgan	Carol	Houston Stronger
Moriarty	Kevin	Dallas Theatre Company
Moriniere	John	Private Individual
Morris	Jeff	Director State Government Relations, Schneider Electric
Moya	Michael	Halff Associates
Moyer	Karen	Private Individual
Mullan	Phil	Houston Stronger
Mullone	T.	Private Individual
Murray	Bridgette	Private Individual
Myers	Matt	Private Individual
Myshrall	Stephen	Houston Stronger
Naccarato	Frank	Private Individual
Nagel	Carol	Houston Stronger
Nam	Yang	Private Individual
Nance	Earthea	Associate Professor, Texas Southern University
Napoli	Michele	Private Individual
Nasta	Napoleon	Houston Stronger
Nazor	Craig	Private Individual
Neal	Jeff	Senior Program Manager, North Central Texas Council of Governments
Nealy	Rebecca	Private Individual
Nelson	Gary	Private Individual

ame		Individual, County, City or Organization
Last	First	
Newberg	Stuart	Private Individual
Ngo	Thinh	Private Individual
Nguyen	Anhlan	Private Individual
Nguyen	Connie Yen	Houston Stronger
Nguyen	Lam	Houston Stronger
Nimmons	Rebecca	Private Individual
Noltemy	Kim	Dallas Symphony Orchestra
Not Provided	Cyndi	Houston Stronger
Not Provided	Gerry	Private Individual
Not Provided	Jessie	Private Individual
Not Provided	Michael H.	Houston Stronger
Not Provided	Not Provided	Candid Realities
Not Provided	Not Provided	Rising Stars Academy
Not Provided	Not Provided	Unidos por King's Colony
Not Provided	Not Provided	Touch Up Makeup Academy
Not Provided	Not Provided	Soul Rep Theatre
Not Provided	Not Provided	Citizens' Environmental Coalition
Not Provided	Not Provided	Mi Familia Vota
Not Provided	Not Provided	Memorial Park Conservancy
Not Provided	Not Provided	LINK Houston
Not Provided	Not Provided	Air Alliance Houston
Not Provided	Not Provided	Coalition of Community Organizations
Not Provided	Not Provided	Texas Organizing Project
Not Provided	Not Provided	Workers Defense Project
Not Provided	Not Provided	West Street Recovery
Not Provided	Richard	Houston Stronger
Not Provided	Wandering Bear	Houston Stronger
Nyberg	Ann	Alderman, Ingleside on the Bay
Nyberg	Larry	Houston Stronger
Nye	Patrick	President, Ingleside on the Bay Coastal Watch Association
Nye	Julie	Private Individual
Oatman	Ken	Private Individual
Obey	Khriz	Private Individual
O'Donoghue	Clive	Private Individual
Olbek-Tooker	Anita	Private Individual
Olds	Karen	Private Individual

ame		Individual, County, City or Organization
Last	**First**	
O'Leary	Sean	Board Member, Flood Mitigation Industry Association
O'Leary	Lindsay	Executive Director, American Society of Civil Engineers - Texas Section
Olk	Jim	Building Officials Association of Texas
ONeal	Denise	Private Individual
Orr	Carla	Private Individual
Orth	Katie	Houston Stronger
Ottati	Joe	Private Individual
Owens	Kelli	Houston Stronger
Paine	Arthur	Private Individual
Painia	Lillie	Houston Stronger
Palagi	Andie	Private Individual
Palay	Chrishelle	Executive Director, Houston Organizing Movement for Equity
Palmer	Daryl	Chapter President, Taylors Organization
Pape	The Honorable Judge Paul	Bastrop County
Parker	Craig	Private Individual
Parker	Beth	General Manager, DeWitt County Drainage District No. 1
Parks	Tom	Houston Stronger
Pastor	Magen	Private Individual
Payne	Jarrod	Private Individual
Peace	Annalisa	Executive Director, Greater Edwards Aquifer Alliance
Pepper	Bradley	Houston Stronger
Perkins	David	Houston Stronger
Perry	Ed	Private Individual
Perry	James	Private Individual
Phelan	Tim	Houston Stronger
Piacentini	Mary Anne	President and CEO, Katy Prairie Conservancy
Picone	Liz	Private Individual
Pier	Collins	Houston Stronger

ame		Individual, County, City or Organization
Last	**First**	
Pittman	Casey	Private Individual
Pluecker	John	Private Individual
Pokorski	Susie	Private Individual
Ponder	Fred	Private Individual
Poppe	Russ	Executive Director, Harris County Flood Control District
Post	Heath	Private Individual
Postali	Clovis	Private Individual
Pousson	Marie	Private Individual
Powell	Emily	Coastal Resilience Specialist, National Wildlife Federation
Pressgrove	Cheryl	Private Individual
Pritchard	Greg	Private Individual
Pruitt	Kelly	Private Individual
Purcell	Sharon	Private Individual
Quate	Amy	Private Individual
Radack	Commissioner Steve	Harris County
Ramirez	Karen	Private Individual
Rapier	Kiley	Houston Stronger
Ratisseau	Philip	Friendswood Citizen Advisory
Ratliff	Robert	Private Individual
Ravenscroft	Doreen	Private Individual
Reckles	Ryva	Private Individual
Reckles	Burt	Private Individual
Redman	Don	Private Individual
Reed	Cyrus	Interim Director, Lone Star Chapter, Sierra Club
Reeder	Sylvester R.	President, Houston One Voice
Remer	Whit	Counsel and Director of Public Policy, Insurance Institute for Business & Home Safety
Remmert	Ashlyn	Private Individual
Remy	Casey Jo	Private Individual
Rengers	Edward	Private Individual
Reynolds	State Representative Ron	Texas House of Representatives
Ricca	Linda	Houston Stronger
Rich	Warren	Private Individual

ame		Individual, County, City or Organization
Last	First	
Richardson	Dean	Private Individual
Richardson	Martha	Private Individual
Ricks	Sarah	Gulf Coast Leadership Council
Ring	Devorah	Houston Stronger
Rios	Mayor Pat	City of Rockport
Rivas	Samantha	City of Friendswood
Rivas	Nelida	Private Individual
Rivas	Pedro	Private Individual
Rivera	Iris	Private Individual
Rives	Marcus	Secretary, Galveston County Consolidated Drainage District
Rives	Bill	Highland Lakes Creative Arts
Rob	Smith	Private Individual
Roberts	Robin	Private Individual
Roberts	Linda	Private Individual
Roberts	Sonya	Houston Stronger
Robertson	Jim	Private Individual
Robinson	Chad	Private Individual
Robinson	Gail	Houston Stronger
Robinson	Mayor Bruce	City of Sour Lake
Robison	Cheryl	Private Individual
Robison	Jill	Private Individual
Robison	Cheryl	Private Individual
Rocke	Jolie	Private Individual
Rodriguez	Jason	Houston Stronger
Rodriguez	Sonia	Houston Stronger
Rodriguez	Herman	City Manager, City of Robstown
Rogerson	Rachel	The Mac
Romero	Robert	Private Individual
Rosenthal	State Representative Jon	Texas House of Representatives
Ross	Hal	Private Individual
Roth	Lisa Gallo	Houston Stronger
Roth	Sandy	Private Individual
Roufa	Elaine	Private Individual
Royster	Peter	Houston Stronger
Ruede	L.J.	Private Individual
Ryan	Caroline	Private Individual

ame		Individual, County, City or Organization
Last	**First**	
Ryan	Hawk	Private Individual
Sachtleben	Kim	Costello Engineering & Surveying
Sackett	Ed	Mission Presbyterian
Sadler	Kelly	Texas Government Relations Manager, International Code Council
Saenger	Scott	Houston Stronger
Salinas	Grace	Associate Planner, Cameron County
Salinas	Rick	Councilmember, City of Lyford
Salles	Jim	Houston Stronger
Sanchez	Claudia	Houston Stronger
Sanders	Fran	Private Individual
Sanders	Mayor William "Butch"	City of China
Sara	Henderson	A R T I P H I L E
Sargent	Alesa	Private Individual
Satyu	Revathi	Indian Cultural Heritage Foundation
Schielack	Kyle	Houston Stronger
Schlosberg	Shayna	Private Individual
Schmidt	Jeffrey	Private Individual
Schneider	Robin	Executive Director, Texas Campaign for the Environment
Schneider	Bobbie	Private Individual
Schoech	D.	Private Individual
Schrauer	Jonathan	Private Individual
Schwartz	Elizabeth	Private Individual
Schwarz III	A. David	Houston Stronger
Schwieterman	Dan	Private Individual
Sears	Julie	Private Individual
Seff	Joshua	Private Individual
Selber	Sara Speer	Private Individual
Seller	Claudia	Houston Stronger
Sellner	John	Houston Stronger
Sellon	Louise	Private Individual
Sesin	Raul	District General Manager, Hidalgo County Drainage District No. 1
Sethness	Doug	Board President, DeWitt County Drainage District No. 1
Sevier-Vuyk	Nicci	Private Individual

ame		Individual, County, City or Organization
Last	First	
Sewright	Kathleen	Private Individual
Shaffer	Tria	Private Individual
Shafransky	Paula	Private Individual
Shanahan	Leesa	Private Individual
Shaw	Ted	President/CEO, Texas Hospital Association
Shelley	Adrian	Director, Texas Office, Public Citizen
Shephard	Gary	Private Individual
Shiekh	Iftikhar	Private Individual
Shiflett	Patricia	Private Individual
Shirey	Martina	Houston Stronger
Siebel	Carey	Private Individual
Silguero	Lisa	Private Individual
Silva	Gumaro	Private Individual
Sims	Christopher	Houston-Galveston Area Council Technical Advisory Committee, League City
Simsen	John	Private Individual
Sinica	Ann Marie	Private Individual
Sinica	Pete	Private Individual
Skirving	Elizabeth	Private Individual
Slawinski	Richard	Private Individual
Sloan	Emily	Private Individual
Sloan	Madison	Director, Disaster Recovery and Fair Housing Project, Texas Appleseed
Smith	Commissioner Charles	Aransas County
Smith	Randolph	Private Individual
Smith	Leslie	Private Individual
Smith	Rob	Private Individual
Smith	Kevin	Houston Stronger
Smith	Holly	Houston Stronger
Smith	Vernon	Houston Stronger
Smith	Richard	President, Cypress Creek Flood Control Coalition
Sokulski	Ashley	Private Individual
Solimine	Shannon	Private Individual
Sparks	Shannon	Private Individual

ame		Individual, County, City or Organization
Last	First	
Spillette	Steve	Private Individual
Sprague	Bruce	Private Individual
St. Clair	Laura	Private Individual
St. Clair	Bill	Houston Stronger
Stafford	Barbara	Private Individual
Staley	Cary	Private Individual
Stalsworth	Wayne	Private Individual
Stefano	Lori	Private Individual
Stein	William	Mid-America Arts Alliance
Steinhaus	Joanie	Gulf Program Director, Turtle Island Restoration Network
Stellar	Scott	Private Individual
Stephens	Judy	Houston Stronger
Stephenson	State Representative Phil	Texas House of Representatives
Stewart	Karen	Jefferson County Drainage District No. 6
Stokes	Karen	Private Individual
Stone	Lisa	Private Individual
Strand	Scott	Private Individual
Striegold	Michael	Houston Stronger
Stroud	Alex	Houston Stronger
Strube	Jill	Private Individual
Stuart	John	Private Individual
Suberg	Renae	Private Individual
Sullivan	Sylvia	Private Individual
Sullivan	Dianne	Private Individual
Suma	Kulkarni	Indian Cultural Heritage Foundation
Summers	Jean	Houston Stronger
Swann	Teresa	Houston Stronger
Swann	Robert	Jazz Stand
Swanson	Romey	Director of Conservation Strategy, Audubon Texas
Swift	Mary Lou	Private Individual
Swisher	Juliana	Houston Stronger
Sykes	Kaye	Private Individual
Taegel	MaryJane	Private Individual
Tanner	Laurel	Private Individual

ame		Individual, County, City or Organization
Last	First	
Taylor	Matthew	Private Individual
Taylor	Howard	Private Individual
Taylor	State Senator Larry	Texas Senate
Telge	Judy	Director, Coastal Bend Center for Independent Living
Teves	Gwyneth	Director, Community Development, City of Wharton
Thatcher	Valerie	Private Individual
Thibodeaux	Julie	Private Individual
Thomas	Stephanie	Houston Area Researcher and Community Organizer, Public Citizen
Thomas	Deidre	Private Individual
Thomas	Rilia	Houston Stronger
Thompson	Sheree	Houston Stronger
Thompson	State Representative Senfronia	Texas House of Representatives
Tiner	Jocelyn	Private Individual
Toguchi	Kae	Private Individual
Toliver	Tricia	Private Individual
Tomsu	Mary	Private Individual
Torres	Commissioner Ellie	Hidalgo County
Torres	Matt	Private Individual
Trahan	Commissioner Johnny	Orange County
Trammell	Vikki	Private Individual
Tran	Thomas	Private Individual
Trapezountious-Graf	Frosy	Houston Stronger
Trautman	Diane	County Clerk, Harris County
Trevino	Cathy	Houston Stronger
Trippe	Gloria	Private Individual
Tsai	Jill	Houston Stronger
Tsuru	Stephanie	Private Individual
Tupper	Aaron	EMC, Hardin County
Turner	Henrietta	City Manager, City of Floresville
Turner	Mayor Sylvester	City of Houston
Tuscher	Ralph	Private Individual
Tuthill	David	Private Individual
Udden	Rebecca	Private Individual

ame		Individual, County, City or Organization
Last	First	
Ukegbu	Kavachi	Private Individual
Unertl	Ann	Private Individual
Urias	Michael	Houston Stronger
Vale	Wayne	Private Individual
Valle	Toni	Private Individual
Van Til	Jack	Houston Stronger
van Zutphen	Catherine	Houston Stronger
Vaughan	Jan	Private Individual
Vazquez	Armando	Houston Stronger
Villarreal	Judith	Private Individual
Vinson	Alia	Houston Stronger
Vogler	Mark	General Manager/Chief Engineer, Fort Bend County Drainage District
Wade	Charles	Houston Stronger
Wadham	Thomas Craig	Private Individual
Wadham	Pamela	Private Individual
Wagner	Adam	HITS Theater
Walker	Margie	Private Individual
Walker	Thea	Private Individual
Walker	Tina	Private Individual
Wallace	Patrice	Private Individual
Wallace	James	Houston Stronger
Walle	State Representative Armando	Texas House of Representatives
Ward	Kerry	Private Individual
Ward	Julie	Houston Stronger
Warren	Lillian	Private Individual
Warren	Lesley	Private Individual
Wasserman	Kate	Private Individual
Watson	Carrie	Private Individual
Watson	Harold	Private Individual
Waxman	David	Private Individual
Waxman	Leslie	Private Individual
Waxman	David	Private Individual
Weakly	Penny	Private Individual
Webb	Dianne K.	Private Individual
Weber	Lore	Private Individual

ame		Individual, County, City or Organization
Last	First	
Webster	Michael	Rice University
Weems	Susan	Private Individual
Weiershausen	Natalie	Houston Stronger
Weiss	Lily	Private Individual
Wemple	Chuck	Executive Director, Houston-Galveston Area Council
Wermers	Johanna	Private Individual
Wesley	F. Robert	Private Individual
West	Peggy	Houston Stronger
Westbrook	Adam	Private Individual
Westlake	Pamela	Houston Stronger
Wharton	Becky	Private Individual
Whitaker	Harold	Committee Member, Clear Creek Watershed Steering Committee
White	Kaiba	Private Individual
White	Heather	Private Individual
White	Elena	Houston Stronger
White	David	Private Individual
White-Olsen	Elizabeth	Programs Director, Bayou City Initiative
Whitmire	State Senator John	Texas Senate
Wieland	Loren	Private Individual
Wienert	John	Private Individual
Wilcher	Tina	Houston Stronger
Wilcox	James	Private Individual
Wilder	Suzi	Ingleside on the Bay
Wilhite	Erin	Houston Stronger
Wilkins	Grover	Orchestra of New Spain
Williams	Terrie	Private Individual
Williams	Sara	EMC, San Patricio County
Williams	Wes	Planning and Zoning Commission, Ingleside on the Bay
Wilshire	Linda	Private Individual
Wilson	Jim	Private Individual
Winsey	Jemila	Houston Stronger
Wong	Stephanie Todd	Director of Performing Arts & Culture, Asia Society

ame		Individual, County, City or Organization
Last	**First**	
Wood	Tena	Houston Stronger
Woodrome	C.D.	City Secretary/Treasurer, City of Ivanhoe
Woods	Laura	Private Individual
Wowk	Katya	Director, Texas OneGulf Center of Excellence, Texas A&M University Corpus Christi
Wright	Sharon	Houston Stronger
Wuthrich	David	Private Individual
Wyman	Stephen	Private Individual
Ximenes	Angelica	Private Individual
Yanez	Guadalupe	Private Individual
Yates	Mark	Director of Economic Development and Community Affairs, Cameron County
Yazdani	Babak	Houston Stronger
Yokom	Vince	Executive Director, Waller County Economic Development Partnership
Young	Elizabeth	Private Individual
Young	John	Private Individual
Young	Jackie	Executive Director, Texas Health and Environment Alliance, Inc.
Youngblood	Jatonia	Houston Stronger
Yowman	Isaac	Private Individual
Zimmerman	Mayor Joe	City of Sugar Land
Zipay	Joanne	Private Individual

The following is a summary of all comments received together with the GLO's responses.

09/26/2019 PUBLIC HEARING IN AUSTIN:

Comment Received: Rural communities should be considered in a different manner than urban communities, as cost-benefit analysis tends to be more negative with rural communities as the population is much lower. The Texas General Land Office should also consider connectivity amongst multiple jurisdictions and the colonias.

Staff Response: The Texas General Land Office remains committed to ensuring CDBG-MIT funds are distributed in a manner that is both within the bounds of the prescribed law and works to achieve the most effective and efficient recovery possible. Every community, regardless of its size and its individual needs, will be given adequate consideration. The competitions have scoring criteria that considers both urban and rural areas.

Comment Received: Communities in the Lower Rio Grande Valley seek to expand existing systems while expanding on other rural service area needs. Cost-benefit analysis for projects will be challenging because of the lower population in this area. It is estimated that at least $180 million are needed in this area.

Staff Response: The Texas General Land Office remains committed to ensuring CDBG-MIT funds are distributed in a manner that is both within the bounds of the prescribed law and works to achieve the most effective and efficient recovery possible. Every community, regardless of its size and its individual needs, will be given adequate consideration. The competitions have scoring criteria that considers both urban and rural areas.

Comment Received (multiple times): Multiple letters from member counties have been sent supporting the public commenter process and a citizen advisory committee. These letters present concerns about the level of involvement the advisory committee will have and suggest local official advisory committees be formed as well.

Staff Response: The Texas General Land Office encourages robust citizen participation at all levels and will continue to administer funding in a manner that adheres to all federal requirements. Should local advisory committees be formed, their input would be valuable to the overall process and the GLO actively invites all impacted parties to partake in the CDBG-MIT process.

Comment Received: HUD CDBG-MIT funds should be locally administered to allow localities to address their diversified needs.

Staff Response: The Texas General Land Office remains dedicated to actively coordinating with localities to ensure that CDBG-MIT funds are distributed in a manner that works to address their

individualized recovery needs. With the exception of the housing programs, all other projects will be implemented by subrecipients contracted with the GLO.

Comment Received: Mitigation efforts should foster long-term resilience; natural and/or nature-based projects to achieve the goals of the CDBG-MIT funds should be given priority. This includes green stormwater infrastructure and hybrid projects.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that fosters a disaster recovery process that emphasizes resiliency. This effort is inclusive of exploring innovative ideas and working to ensure that all projects are given adequate consideration for funding.

Comment Received: Our city is in the most impacted and distressed area and eligible to receive CDBG-MIT funds, but there is a conflict existing between our city and the county in terms of how these funds should be administered. We are requesting more guidance and methodology on how to navigate these dynamics. We are also in need of information technology resiliency.

Staff Response: The Texas General Land Office, as the primary administrator of CDBG-MIT funds, remains committed to crafting policies and procedures that facilitate the coordination of disaster recovery programs amongst cities, counties, and other units of local government. As stated in the Action Plan, eligible entities are encouraged to collaborate on a regional level. The Texas General Land Office can help organize meetings with the city and county to work through potential partnerships.

Comment Received: Will faith-based entities be eligible for consideration for funding?

Staff Response: Faith-based entities are not directly eligible to apply for the CDBG-MIT funds but can be sponsored by eligible applicants for CDBG-MIT eligible projects.

10/01/2019 PUBLIC HEARING IN BEAUMONT:

Comment Received: I request that there should be no substantial damage rule from FEMA; I am concerned with covered projects. Counties need authority to enforce building standards. No buyouts—want to redevelop buyout property.

Staff Response: The Texas General Land Office recognizes this comment and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Create special allocation for 2015 and 2016 flooding. There is a need for interoperable communications.

Staff Response: The Texas General Land Office recognizes this comment and will give it adequate consideration as CDBG-MIT programs and policies progress. It should be noted that the CDBG-MIT Action Plan, as currently written, contains programs that directly work to address 2015 and 2016 Flood needs. For more information on those programs, see the Action Plan.

Comment Received: Planning needs to give special consideration to islands such as Galveston. Projects that need to be considered include: pump/drainage stations; water line; and sewage. The citizen advisory committee is a good idea.

Staff Response: The Texas General Land Office recognizes this comment and will give it adequate consideration as CDBG-MIT programs and policies progress. All the projects identified are likely to be eligible.

Comment Received: I am concerned about drainage district eligibility. Watershed planning is more appropriate than other ways to plan.

Staff Response: The Texas General Land Office recognizes this comment and will give it adequate consideration as CDBG-MIT programs and policies progress. Drainage districts will be eligible to compete for the Hurricane Harvey State Mitigation Competition.

Comment Received: Our community is young and growing. We have flooding in older areas of town—please take this into consideration. Our community has a covered project, but lower threshold to $75 million. The 51% LMI is still too high.

Staff Response: The Texas General Land Office remains committed to ensuring CDBG-MIT programs are administered within the bounds of the law, including the LMI aggregate requirement. Absent a waiver or directive from HUD, all HUD-implemented rules and regulations must be followed. The Texas General Land Office is also strongly considering altering the minimum threshold requirement for certain CDBG-MIT programs. For updated thresholds, see the Action Plan.

Comment Received: Request for public health and safety—need utility backup, standby generators to maintain pressure; utility sharing between larger systems.

Staff Response: The Texas General Land Office recognizes this comment and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The Texas General Land Office needs to conduct more outreach. 50% state requirement will hurt coastal areas. Communities of color are in the most vulnerable, neglected areas.

Staff Response: The Texas General Land Office recognizes this comment and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: As much flexibility as possible needed. Buyouts are not a good idea—infrastructure much more needed. Give COGs allocations. Special districts are very important.

Staff Response: The Texas General Land Office recognizes this comment and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: There are a variety of issues in Port Arthur due to past storms; USACE drainage plan mentioned.

Staff Response: The Texas General Land Office recognizes this comment and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Rural counties should be considered in funding. I would like to know if we can we use funds for match with TxDOT and other projects.

Staff Response: CDBG-MIT funds can be used as match subject to program and CDBG-MIT regulations.

Comment Received: Stay focused on where damage is; emphasize community over region. I am opposed to using these funds for buyouts. Please put more into infrastructure.

Staff Response: The Texas General Land Office recognizes this comment and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: I am concerned about city of Port Arthur drainage system; high LMI impacted; anti-buyout; Port Arthur drainage comes from outlying communities and affects people of color. Pay attention to how money is spent, as well as speed of spending. Local oversight is important.

Staff Response: The Texas General Land Office recognizes this comment and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: LMI requirements – please reduce this requirement further. Need county-wide drainage plan only. Local communities know best. Buyouts worked in Liberty County.

Staff Response: The Texas General Land Office remains committed to ensuring CDBG-MIT programs are administered within the bounds of the law, including the LMI aggregate requirement. Absent a waiver or directive from HUD, all HUD-implemented rules and regulations must be followed.

Comment Received: Can a drainage district be a subrecipient?

Staff Response: Drainage districts are eligible to participate in the Hurricane Harvey Competition.

Comment Received: Drainage districts needs to be a direct recipient. What is their eligibility status?

Staff Response: Drainage districts are eligible to participate in the Hurricane Harvey Competition.

Comment Received: LMI is problematic—storms do not recognize the affluent. 100% of allocation should go to MID communities. Local communities know best. Do not duplicate efforts; please coordinate with the TWDB.

Staff Response: The Texas General Land Office remains committed to ensuring CDBG-MIT programs are administered within the bounds of the law, including the LMI aggregate requirement. Absent a waiver or directive from HUD, all HUD-implemented rules and regulations must be followed.

Comment Received: There are underlying issues of not having clear title to property. Please provide outreach and education for legal aid, estate planning, and financial planning.

Staff Response: The Texas General Land Office recognizes this comment and will give it adequate consideration as CDBG-MIT programs and policies progress.

10/02/2019 PUBLIC HEARING IN CORPUS CHRISTI:

Comment Received: It is difficult to establish 50% LMI rule due to seaside community's resident makeup. We will work with the local COG to allocate funds.

Staff Response: Per HUD's regulation, 50 percent of CDBG– MIT funds must benefit low- and moderate-income persons.

Comment Received: We are dismayed about not being able to use funds for EMC facilities

Staff Response: The Texas General Land Office recognizes this comment and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The county has a Hazard Mitigation Plan that incorporates all communities.

Staff Response: The Texas General Land Office recognizes this comment.

Comment Received: We demand that federal officials change HUD approach and burdensome rules and regulations.

Staff Response: The Texas General Land Office remains committed to ensuring CDBG-MIT programs are administered within the bounds of the law, including all HUD mandates. Absent a waiver or directive from HUD, all HUD-implemented rules and regulations must be followed.

Comment Received: The city was greatly impacted by natural disasters. The city is still trying to rebuild after recent disasters.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: I am upset that HUD will not listen to local communities. Rules are being made without our input and are out of date.

Staff Response: The Texas General Land Office remains committed to ensuring CDBG-MIT programs are administered within the bounds of the law, including all HUD mandates. Absent a waiver or directive from HUD, all HUD-implemented rules and regulations must be followed.

Comment Received: Community infrastructure and homes were greatly impacted by recent natural disasters and increased ship activity. It is difficult to find resources for repairs for mitigation.

Staff Response: The Texas General Land Office recognizes this comment and encourages the community to explore the CDBG-MIT Programs in an effort to fund the infrastructure needs referenced herein.

Comment Received: There is continuous damage to the city's shoreline due to an increase in coastal activities. Our city is still damaged from past events.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: There is an increase of ship traffic which is affecting our coastline. Our city is and was greatly impacted by past events.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Please include small-town projects when the GLO selects projects. Small towns are greatly impacted by past events.

Staff Response: The Texas General Land Office remains dedicated to ensuring all eligible applicants are given adequate consideration, regardless of the size of the applying entity, as they

are scored. All applications will be scored against the correlating program criteria and selected based on those evaluations.

Comment Received: There was significant damage to the local marina; we still are trying to recover.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The majority of the 400 lots on the water are in the floodplain. Our local community's needs were not included in San Patricio County flood mitigation plan; we are reworking our own plan. Request that small towns such as ours are included in funding.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress. Cities and counties will be eligible for the competitions and the Regional Mitigation (COG MOD) Program.

Comment Received: Local ship channels are greatly impacted by past events and increasing weather conditions. We have formed a coastal watch association.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The LMI requirement is too high—communities need more flexibility; drainage, water and sewer are priorities. LMI does not follow block group boundaries which makes it more difficult to meet the LMI requirement.

Staff Response: The LMI requirement is required under federal law and, absent a waiver or directive from HUD, shall remain fully enforced by the GLO.

Comment Received: Our region still has acute need for housing vouchers for LMI persons impacted by Harvey; lack of affordable rental housing was already a problem in the area before disasters. We are working to find the exact level of need for rental housing.

Staff Response: The Texas General Land Office has no authority over housing vouchers. The Hurricane Harvey $5.6 billion allocation is currently building over 4,800 rental units of which of over 3,800 for low- to moderate-income renters with an investment of $450 million.

Comment Received: Communities need to harden fuel infrastructure, EMS aircraft facilities, and upgrade helicopters to all weather.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: LMI doesn't work in coastal communities due to high-value properties; projects must be hardened for everyone, not just the LMI population.

Staff Response: Absent a waiver from HUD, the LMI requirement presented under the correlating Federal Register notice must be followed.

Comment Received: Our county was and is still greatly impacted by past natural disasters. Counties do not have enough power to enforce code regulations. We need county building code authority.

Staff Response: The Texas General Land Office agrees that building codes are very important to mitigate for future disasters but the GLO has no authority to grant such authority.

Comment Received: Smaller communities lack personnel to develop projects; we have had challenges with grants administrators.

Staff Response: The Texas General Land Office recognizes this comment and would like to emphasize that it is dedicated to providing technical guidance and assistance to eligible program participants.

Comment Received: Challenge with educating the public about risks; new residents do not know what to do in case of a natural hazard and don't know the risks they face.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: There needs to be an increased amount of non-traditional housing in our region.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress

Comment Received: I am concerned about the LMI rule using Census data: it does not reflect conditions in the community. Surveys are difficult for small communities to complete.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: I am discouraged about HUD restricting EMS activities. We should be able to mitigate EMS facilities.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: We already have $2 million worth of projects identified; it is important that our bulkheads can be repaired with these funds.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: We must help the LMI population. LMI residents live throughout the region and should not be forgotten.

Staff Response: The Texas General Land Office recognizes this comment and would like to reiterate that it is dedicated to complying with the federally mandated LMI aggregate requirement.

12/02/2019 PUBLIC HEARING IN ROCKPORT:

Comment Received: The 50% LMI rule is difficult to meet in Aransas County. We are also concerned that the Action Plan MIT COG allocation of $79 million to share between 43 jurisdictions is insufficient for what was essentially ground zero when Harvey made landfall. Funding should be allocated at the hardest impacted area first and then expand from there.

Staff Response: The Texas General Land Office remains committed to ensuring all CDBG-MIT funds are allocated in full compliance with all applicable rules and regulations promulgated by HUD. The Texas General Land Office understands the concerns raised by smaller communities and will work diligently to ensure that the needs of all Texans are adequately considered as programs and projects develop.

Comment Received: Assistance is needed for bulkhead repairs that are very important to protect homes from the next storm and flooding. We are worried that Rockport will lose out to larger metro areas for funding.

Staff Response: The Texas General Land Office remains committed to ensuring that the individual needs of impacted communities are considered and addressed within the bounds of the rules and regulations governing the CDBG-MIT allocation, regardless of the size of the community.

Comment Received: CDBG-MIT funding should be administered with a regional perspective to build a regional breakwater through the Coastal Resiliency Program. Work should also be prioritized for projects that have already been identified and planned. The top priority for any study should be drainage and aligning how river basins interconnectivity impact large-scale projects.

Staff Response: Per the CDBG-MIT draft Action Plan, the GLO has structured project consideration in a manner that permits regional collaboration to ensure large-scale projects are

achievable and encourages projects previously identified for additional points in competitions. The Texas General Land Office remains committed to ensuring mitigation projects, especially those that impact regional watersheds, are developed in a manner that considers regional impacts.

Comment Received: I am in support of the CDBG-MIT State Action Plan as it is great for small communities. Despite this, those communities still have needs and consideration should be given; HUD money is needed because these smaller communities have very limited resources.

Staff Response: The Texas General Land Office recognizes that smaller communities lack the resources of their larger counterparts and has worked to design project evaluation criteria that ensures all proposed projects are weighed and considered before funding awards are issued.

Comment Received: More oversight is needed for the COG Methods of Distribution in the MIT State Action Plan.

Staff Response: All COG Methods of Distribution must go through a full public participation effort and be submitted to and approved by the GLO before they can be fully implemented under the CDBG-MIT Action Plan.

Comment Received: We are concerned that small towns will not be able to put together a competitive application with their already limited staff. There are lots of smaller communities that are not a 50% LMI community, but still have needs. We disagree with the poverty rate tie-breaking procedures and would like to request the elimination of unnecessary rules. Bonus points should also be given for innovative ideas.

Staff Response: The Texas General Land Office recognizes the needs of smaller communities that may not have the same resources as their larger counterparts and remains dedicated to ensuring that these communities are given an equal opportunity to apply for funding under the CDBG-MIT Action Plan.

Comment Received: We are concerned that funding is spread too thin and does not address the hardest hit areas.

Staff Response: The Texas General Land Office remains committed to ensuring all CDBG-MIT funds are administered in a manner that is both in compliance with all applicable rules and regulations and works to help all impacted Texans make the most effective and efficient recovery possible. In an attempt to fund larger projects, the GLO has increased project minimums in all programs being offered.

Comment Received: The Coastal Watch Association would like to call for more planning activities as warranted by rising sea levels and continuous flooding.

Staff Response: The Texas General Land Office allocated funds across multiple project types in an attempt to cover as many mitigation needs as possible.

Comment Received: How does a small community fit into the scoring category?

Staff Response: Smaller communities are as eligible to apply for CDBG-MIT funds as their larger counterparts. The Texas General Land Office plans to have multiple application workshops along with application support materials to make the application process as simple as possible within the federal requirements.

Comment Received: We are concerned that business owners in Rockport, who do not own their retail space, are not eligible for aid.

Staff Response: HUD determined that direct economic development activities would not be eligible for CDBG-MIT funds. Instead, mitigation that protects business concerns will be eligible.

Comment Received: Breakwaters and bulkheads are difficult and expensive projects to accomplish and other means of mitigation should be strongly considered. We are concerned about the LMI requirement, as stormwater and flooding do not discriminate based on income levels.

Staff Response: Absent a valid waiver from HUD, the GLO remains committed to ensuring the federal LMI requirement, as written, is met.

Comment Received: We would like to formally complain that there have been no GLO funds to date in Aransas County.

Staff Response: The GLO has granted more than $32.5 million in CDBG-DR assistance directly to Aransas County as part of the Hurricane Harvey State Action Plan. To date, a combined estimate of $15.1 million in homes have been constructed in the county through the Homeowner Assistance Program, with another $78.2 million of approved homeowner applications for the Coastal Bend still to be built.* Hundreds of thousands of dollars are being reimbursed to Aransas County storm survivors who did their own repairs and applied to the Homeowner Reimbursement Program. Over $19 million has been approved for multifamily projects in the Affordable Rental Program, with one project already completed. In addition to this, the GLO has conveyed over $4.3 million to the Coastal Bend Council of Governments region as part of its direct housing mission on behalf of FEMA, much of it going to shelter Aransas County residents.

Comment Received: The Mayor of Rockport would like to emphasize a regional approach to all projects eligible under the CDBG-MIT funding.

Staff Response: The Texas General Land Office has recognized the importance of emphasizing regional projects for mitigation purposes and encourages the development of such projects in order

to foster the most holistic approach to mitigating the effects of future weather events. However, the GLO also recognizes that, in some instances, a regional approach to a project is unnecessary and, therefore, has crafted the draft Action Plan in a manner that balances these two perspectives.

Comment Received: Thank you to George P. Bush for assistance to Coastal Bend, and for holding public hearings.

Staff Response: The Texas General Land Office recognizes and appreciates this comment for praising the agency's efforts to remain in compliance with all public participating requirements promulgated by HUD.

12/09/2019 PUBLIC HEARING IN DALLAS:

Comment Received: We agree that is a good idea to integrate regional planning into studies, but there needs to be flexibility in award amounts for all mitigation programs.

Staff Response: The Texas General Land Office recognizes this comment and appreciates the positive feedback.

Comment Received: Future population growth should be considered in scoring for the 2015 and 2016 Floods programs. Future programs need to have a growth factor in all future programs.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: I disagree with the two-application limit and single activity limit. These restrictions are hard on small communities.

Staff Response: The Texas General Land Office, in response to the public comment process, is considering altering the cap on the maximum number of applications each entity may submit for consideration. For final number of applications per applicant, see the Action Plan.

Comment Received: I think that applicants should be able to address activities beyond mitigation.

Staff Response: All eligible activities under CDBG-MIT programs are specifically prescribed by federal law and, absent a change issued from HUD, cannot be altered.

Comment Received: The Texas General Land Office should remove the single activity limit from all mitigation programs.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

12/10/2019 PUBLIC HEARING IN WESLACO:

Comment Received: HMGP Planning—needs to be 2 years instead of 1 year prior to expiration. Will communities be able to apply for MOD and competition? Do RFP/RFQs need to be separate, or can they do one general MIT application? Please make available data to determine admin cost caps.

Staff Response: This change can be made to the program. Any vendor selections must be compliant with all state, local, and federal procurement regulations. The caps for admin costs are in line with previous disaster recovery programs administered by the GLO.

Comment Received: MIT Action Plan does not have a way to move a family to a house outside a flood prone area; please reincorporate buyouts/relocations into the Action Plan. Try to include reconstruction after a buyout. Can HMGP eligibility be used for Action Plan eligibility?

Staff Response: Buyout or acquisition with or without relocation assistance, down payment assistance, housing incentives, and demolition is an eligible activity under several CDBG-MIT programs.

Comment Received: Are matching funds required? Can we use MIT for matching? Need a fast turnaround time for application (environmental/historical).

Staff Response: Matching funds are not required; however, points are given for leverage in the three mitigation competitions.

Comment Received: Does not like two-application limit. Difficult for drainage districts.

Staff Response: The Texas General Land Office, in response to the public comment process, is considering altering the cap on the maximum number of applications each entity may submit for consideration. For final number of applications per applicant, see the Action Plan.

Comment Received: Please open program competitions to Hidalgo County. District is qualified to handle large applications, has several shovel-ready projects. Please make districts eligible to apply. Difficult to achieve BCA due to low-income population. Two-application limits are difficult.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Please allow submissions of more than two projects. TDEM likes Willacy County projects for regional impact. Please clarify lead applicant on multiple jurisdiction projects. Can one procurement work for multiple projects?

Staff Response: The Texas General Land Office, in response to the public comment process, is considering altering the cap on the maximum number of applications each entity may submit for consideration. For final number of applications per applicant, see the Action Plan.

Comment Received: Work on faster turnaround. Need flexibility for spending time limits.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Cameron County needs Most Impacted designation so that they can participate. No funding for Coastal Resiliency Program; please reconsider.

Staff Response: HUD most impacted and distressed (HUD MID) was determined by HUD and identified in the CDBG-MIT Federal Register notice. Cameron County is designated a 2016 State MID county.

12/11/2019 PUBLIC HEARING IN HOUSTON:

Comment Received: Houston and Harris County have experienced five events in the last 5 years, with Harris County being the only county impacted during all 3 of the mitigation years. Without mitigation infrastructure, Houston and Harris County will remain highly vulnerable to future disasters. The Action Plan hinders Houston's ability to achieve resiliency, as funds are not awarded proportionately and the idea of regional coordination is problematic. Nearly half of the people affected by recent disasters live in Houston and Harris County, but half of the CDBG-MIT funds are not allocated to reflect this statistic. Houston and Harris County have partnered on projects, but the GLO should be clearer in how it intends to prioritize regional projects.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible. In fostering an atmosphere of regional cooperation, CDBG-MIT funds may provide the most wide-scale impact of mitigation dollars possible. The Texas General Land Office seeks to ensure that all federal allocations are used in a manner that creates the most benefit possible. Based on public comment, the GLO will be updating how the Hurricane Harvey Competition will be administered.

Comment Received: It is not proportionate nor fair that Harris County is only receiving, at best, 8.3% of the CDBG-MIT funds. This is not proportional to impact. COG approach to MODs is unfair, as Houston and Harris County are outvoted in H-GAC because they are outnumbered by suburban counties, even though Harris County brings a lot of resources to the COG. It is an issue that each applicant must complete a project before a second round of projects are considered.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible. In fostering an atmosphere of regional cooperation, CDBG-MIT funds may provide the most wide-scale impact of mitigation dollars possible. The Texas General Land Office seeks to ensure that all federal allocations are used in a manner that creates the most benefit possible. Based on public comment the GLO will be updating how the Hurricane Harvey Competition will be administered.

Comment Received: The Action Plan needs to be clearer and consideration should be given to either increasing or eliminating the dollar amount cap.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible. In fostering an atmosphere of regional cooperation, CDBG-MIT funds may provide the most wide-scale impact of mitigation dollars possible. The Texas General Land Office seeks to ensure that all federal allocations are used in a manner that creates the most benefit possible. Based on public comment the GLO will be updating how the Hurricane Harvey Competition will be administered.

Comment Received: Covered Projects should be included in the Action Plan prior to submittal to HUD to speed up overall project delivery.

Staff Response: It was not possible to take applications for Covered Projects and meet the Action Plan submittal requirements. Any Covered Projects will be detailed in subsequent Action Plan amendments.

Comment Received: The Texas General Land Office should not punish joint applications; any joint applications should not count against the limit set for individual application submittals.

Staff Response: In response to public comments, the GLO will be adjusting the number of applications allowable in the Hurricane Harvey State Mitigation Competition.

Comment Received: Economic benefits should be given more consideration in project evaluations. Requests more clarity as to how vulnerable populations are impacted.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible. In fostering an atmosphere of regional cooperation, CDBG-MIT funds may provide the most wide-scale impact of mitigation dollars possible. The Texas General Land Office seeks to ensure that all federal allocations are used in a manner that creates the most benefit possible

Comment Received: The required timeline for project delivery is an issue and should be reevaluated. Covered Projects should not be limited to $100,000,000, as Harris County and Houston are working on watershed projects that far exceed the maximum established.

Staff Response: The Texas General Land Office recognizes these comments and will give them adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The cost-benefit analysis is concerning. There should be an exploration into the capturing of fresh water, as it could be an asset for mitigation.

Staff Response: The Texas General Land Office recognizes this comment and will give it adequate consideration as the CDBG-MIT programs progress.

Comment Received: Although DeWitt County is identified in the MIT Action Plan as a State MID for 2015 Floods and Harvey, the money delivered through the COGs renders the county not eligible for funding. DeWitt County is very small with four employees and an annual revenue of only $313,000. This limits access to quality grant writers. DeWitt County's property values are skewed because of mineral resources and this should be considered.

Staff Response: The COG MODs will be created with the benefit of full citizen participation. The Texas General Land Office would encourage the county to make their needs and concerns known to the COG in advance of and during that process. It should be noted that the GLO is dedicated to ensuring that all impacted communities, regardless of size, are presented with an equitable opportunity to participate in CDBG-MIT programs.

Comment Received: The Galveston County Consolidated Drainage District is one of the most disenfranchised and hopes to be included in the process and qualified to receive MIT funding.

Staff Response: The Texas General Land Office remains committed to ensuring all CDBG-MIT applicants are equitably evaluated as decisions for grant awards are made under respective programs.

Comment Received: I am concerned about the joint application limitations counting against each applicant. Friendswood is limited to submitting regional projects due to LMI requirements. I would like to request a reconsideration of the LMI requirement.

Staff Response: The Texas General Land Office recognizes and appreciates the content of this comment but the GLO has no ability to lower the 50% LMI requirement without a waiver from HUD, and to submit a waiver request, the GLO must have adequate project details to move forward.

Comment Received: I would like to emphasize and encourage a regional focus for the Clear Creek and Dickinson Bayou area.

Staff Response: The Texas General Land Office encourages the regional development of projects under programs presented by the draft CDBG-MIT Action Plan. Coordination of local entities to ensure mitigation efforts work to aid an entire impact area are strongly encouraged.

Comment Received: Flooding is caused by both nature and man and this should be taken into consideration. There should also not be a reliance on county lines for project consideration, as upstream and downstream projects impact surrounding areas.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration CDBG-MIT programs develop.

Comment Received: Duplication of Benefits and Small Business Loans should be reexamined for HRP applicants and participants.

Staff Response: This comment is outside of the scope of the CDBG-MIT Action Plan.

Comment Received: Friendswood City Council partnered with another group to conduct a study that revealed Clear Creek as the bottleneck for flood waters and has worked to design improvements. We are ready to partner with Galveston County CDD and HCCD to conduct this project. A bond in the amount of $41 million in local money has already been passed that could be used as a match. Solving this issue would solve many issues for the entire watershed.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop. The Texas General Land Office would also like to encourage the commenter to remain actively engaged with local officials as project proposals are drafted to ensure all needs are considered.

Comment Received: There are equity concerns with the Action Plan. Climate change should be discussed and considered. Green energy and energy storage should be highlighted as a mitigation strategy.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: There is something wrong with the entire allocation process designed by the GLO. I hope the GLO will revamp the process because it is currently inadequate.

Staff Response: The Texas General Land Office recognizes the concerns presented by this comment and remains dedicated to ensuring that the allocation of CDBG-MIT funds is done in a manner that is consistent with all applicable federal law.

Comment Received: The public comment period of 45 days over the holidays is inadequate and would like the GLO to add additional time.

Staff Response: The Texas General Land Office remains committed to ensuring the satisfaction of all public participation requirements established under the federal rules. In compliance with those rules, the GLO has implemented the required 45-day public comment period along with a series of public hearings in various locations across Texas to give stakeholders every opportunity to submit feedback on the draft CDBG-MIT Action Plan.

Comment Received: Deep inequities are imbedded in the details of the mitigation programs.

The SoVI Index is not described in any detail nor is it explained how it will be used.

The cost/benefit analysis is discriminatory against poor people and it should not be the basis upon which assistance is awarded. Pollution should be a listed hazard in the Action Plan.

Staff Response: The Texas General Land Office recognizes this comment and will give the entirety of its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: The Action Plan does not detail how Houston and Harris County are working together to tackle flooding issues.

Staff Response: The CDBG-MIT draft Action Plan does not provide an outline of how communities may or may not be collaborating for mitigation efforts, but instead provides an overview of available programs under the CDBG-MIT allocation. Should Houston and Harris County decide to take a collaborative approach in participating in any of the enumerated programs, the GLO would then consider their application in accordance with the application criteria provided under that particular program.

Comment Received: There is no equity in making the needs of COGs equal to the needs of cities and counties. This takes away resources from cities and lacks equity because county and city collaboration are penalized under the application limit.

Staff Response: The Texas General Land Office recognizes this comment and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The Texas General Land Office should reconsider the restriction on funding for emergency response teams. The 50% LMI requirement should not be waived.

Staff Response: The Texas General Land Office remains committed to ensuring all CDBG-MIT funds are administered in accordance with federal law. Eligible activities for federally awarded funds are determined by HUD and the GLO is unable, absent a directive from HUD, to change those activities. Absent a waiver or directive from HUD, The Texas General Land Office shall administer all CDBG-MIT funds in accordance with the 50% LMI requirement.

Comment Received: These funds should not be competitive as competition between communities causes friction. Our community cannot wait on the GLO to decide on rules for how CDBG-MIT funding should be disbursed.

Staff Response: The Texas General Land Office has structured some programs as competitions in order to foster an environment that opens the door for any and all applicants to access CDBG-MIT funding. The Texas General Land Office remains committed to following all Action Plan review and approval timelines mandated by HUD and shall award funds in accordance with those timelines.

Comment Received: The cost-benefit analysis is concerning as the Action Plan is unclear as to how the state will conduct the analysis. The State should value people over property. Housing Act and Title 6 should be given consideration as project approval and processing may be violative.

Staff Response: The Texas General Land Office remains committed to ensuring that all programs developed and implemented under the CDBG or CDBG-MIT framework are in compliance with all applicable federal laws, including the Fair Housing Act.

1/9/2020 PUBLIC HEARING IN JASPER:

Comment Received: What was the coordination with TDHCA? We are concerned about having sufficient help for housing programs.

Staff Response: TDHCA is a partner that the GLO consults with on a regular basis. The GLO remains committed to ensuring all programs under the CDBG-MIT allocation are administered in the most effective and efficient manner possible. Those efforts include to provision of technical assistance, as warranted, to ensure subrecipients are given all the tools they need to run a successful program.

Comment Received: I have many concerns over the allocations among regions with little more than 10% of funds allocated to the COGs. I support that competitions are not open to special districts. I believe the FEMA cost scoring is an issue.

Staff Response: The Texas General Land Office recognizes the comments presented above and will give each adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Flexibility and local control are extremely important, and I support everyone working together in regions.

Staff Response: The Texas General Land Office appreciates this comment and agrees mitigation is often regionally based.

Comment Received: We were fined by TCEQ for Harvey damage and need funding to make repairs, not drainage. The Gulf Coast drainage criteria needs to be changed as shallow storage doesn't work and interferes with septic systems. Drainage money should be coordinated with upper and coastal regions.

Staff Response: The Texas General Land Office recognizes the comments presented above and will give it adequate consideration as CDBG-MIT programs and policies progress. Additional detail will be provided in the program application guides that will be forthcoming in the next couple months.

Comment Received: FEMA denied the area Harvey funds and small communities cannot fix sewer and water systems on their own.

Staff Response: The Texas General Land Office recognizes the comment presented above and will give it adequate consideration as CDBG-MIT programs and policies progress. The commenter is also encouraged to explore the options that may be presented under CDBG-MIT programs to remedy the sewer and water system issues cited.

Comment Received: Direct allocations are better for smaller and rural communities as it is too difficult to compete with larger jurisdictions. Grant administrators are rare and smaller communities should still get their fair share of funds. Set asides should be created to help with the application process. Everyone should play by the same rules as it is not always cheaper to live in a rural area.

Staff Response: The Texas General Land Office recognizes this comment and will give it adequate consideration as CDBG-MIT programs and policies progress and remains committed to ensuring all programs under the CDBG-MIT allocation are administered in the most effective and efficient manner possible. Those efforts include to provision of technical assistance, as warranted, to ensure subrecipients are given all the tools they need to apply for funds and complete projects.

The Texas General Land Office will also give adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Thank you for extending the comment period. More money should be allocated to the COGs as the current allocation is insufficient. The 50% LMI rule is better, but still prohibits some communities from receiving aid.

Staff Response: The Texas General Land Office recognizes the content of this comment will give each point presented adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: I support special districts being able to participate. The LMI requirement is always an issue as flooding does not discriminate. Competitive aspects make it difficult for smaller communities.

Staff Response: The Texas General Land Office appreciates the support offered in this comment and remains committed to meeting all the federal requirements associated with the funds.

Comment Received: I do not like the LMI requirement because it does not work for rural areas. Additionally, I do not know how my area will get funding given the requirement.

Staff Response: The Texas General Land Office must comply with the 50% LMI aggregate requirement set by HUD, absent a waiver.

Comment Received: I have the following comments regarding the CDBG-MIT Action Plan:

Does the $3 million floor cover one or multiple projects? How does the 50% LMI requirement play into the competitions? Rural communities are confused about procurement and need more technical assistance.

Staff Response: The competition floor for the Hurricane Harvey State Mitigation Competition will be $3 million for a single project serving a single service area. LMI is a part of the overall scoring for all the program competitions. The Texas General Land Office has already begun plans to provide additional procurement technical assistance in advance of the MIT funds. In the meantime, the commenter is encouraged to look to the GLO website for procurement guidance and tools.

Comment Received: Our jurisdiction would like to see an increase in the COG allocations. Communities are being further impacted as disaster victims are leaving the area.

Staff Response: The Texas General Land Office recognizes the content of this comment will give each point presented adequate consideration as CDBG-MIT programs and policies progress.

NON-PUBLIC HEARING COMMENTS:

Comment Received: Aransas County supports the reduction of the overall LMI benefit requirement from 70% down to 50%.

Staff Response: The Federal Register allows for the overall aggregate for LMI to be at 50% of the total funds. The Texas General Land Office appreciates the support from Aransas County in efforts being made to ensure that the HUD CDBG-MIT funding works to serve as many impacted Texans as possible.

Comment Received: Funding from the MIT Action Plan should include at least $100 million to provide for the unmet need in Aransas County.

Staff Response: Aransas County will be eligible to be considered for participation in several different programs from the MIT allocation. The Texas General Land Office is committed to working with impacted localities to ensure that Methods of Distribution consider all relevant factors in order to provide as much aid to as many Texans as possible.

Comment Received: It is requested that at least one of the planned public Commenter hearings planned by the GLO be held in Aransas County.

Staff Response: The Texas General Land Office shall, as required by the Federal Register, conduct a robust citizen participation procedure to ensure all impacted communities and Texans are given the ability to provide input on the CDBG-MIT State Action Plan.

Comment Received: It is requested that GLO staff visit Aransas County to meet with the county long-term recovery team for a detailed briefing.

Staff Response: The Texas General Land Office shall, as required by the Federal Register, conduct a robust citizen participation procedure to ensure all impacted communities and Texans are given the ability to provide input on the CDBG-MIT State Action Plan.

Comment Received: We are concerned that Aransas County will be disproportionately left out of the Method of Distribution calculation as a result of our overall population.

Staff Response: The Texas General Land Office remains committed to the equitable development of COG Methods of Distribution to ensure that funding is distributed in a manner that is both consistent with the applicable rules and regulations and that addresses the need of impacted communities.

Comment Received: The highest priority should be given to natural and nature-based projects, including urban and non-urban infrastructure projects.

Staff Response: The Texas General Land Office is working with the agency's Texas Coastal Resiliency Master Plan in the selection of projects that consider green infrastructure, gray infrastructure, and nonstructural measures.

Comment Received: We urge the GLO to dedicate a significant percentage of these funds toward coastal resilience to implement nature-based projects contained within the 2019 Texas Coastal Resiliency Master Plan.

Staff Response: The Texas General Land Office is working with the agency's Texas Coastal Resiliency Master Plan in the selection of projects that consider green infrastructure, gray infrastructure, and nonstructural measures.

Comment Received: We urge an emphasis on coastal resilience to provide opportunities to leverage existing funding mechanisms with MIT funds.

Staff Response: The Texas General Land Office is considering a community's ability to leverage other funds in the criteria for the competitions.

Comment Received: We urge the incorporation of green stormwater infrastructure in coastal and inland areas, and especially within the most impacted and distressed areas.

Staff Response: The Texas General Land Office is working with the agency's Texas Coastal Resiliency Master Plan in the selection of projects that consider green infrastructure, gray infrastructure, and nonstructural measures.

Comment Received: We firmly believe that protecting the natural systems that provide existing disaster mitigation benefits is critical for successfully reducing risk from future disasters.

Staff Response: The Texas General Land Office also believes that mitigation efforts are critical as the Texas Coast will continue to be impacted by future events.

Comment Received: We support the GLO's efforts to upgrade its state Hazard Mitigation Plan to an Enhanced Mitigation Plan to comprehensively assess vulnerability for future.

Staff Response: The Texas General Land Office appreciates the support in efforts being made to ensure that the HUD CDBG-MIT funding works to serve as many impacted Texans as possible.

Comment Received: It the position of multiple cities and counties that HUD CDBG-MIT funds remain locally administered to allow each locality to administer the funds as they see appropriate.

Staff Response: The Texas General Land Office remains dedicated to actively coordinating with localities to ensure that CDBG-MIT funds are distributed in a manner that works to address their individualized recovery needs. With the exception of the housing programs, all other projects will be implemented by Subrecipients contracted with the GLO.

Comment Received: I would like to respectfully comment that local county governments are in a unique position to take the lead in developing county-wide action plans that incorporate housing and non-housing activities as well as identify and incorporate human support services.

Staff Response: The Texas General Land Office remains committed to ensuring that CDBG-MIT are allocated in a manner that works to address the unique challenges faced by individual communities. This process includes a robust citizen participation process and active consultation and incorporation the expertise and knowledge held by local governments.

Comment Received: Port Aransas is often forgotten by federal grants and donations due to its size. The city was completely destroyed and the majority of homes that sustained damage house employees that are vital to the functioning of the city. Please consider Port Aransas as a top priority when looking to award assistance.

Staff Response: The Texas General Land Office remains committed to ensuring the mitigation needs of all impacted Texas communities are thoroughly evaluated during the administration of CDBG-MIT Programs. All impacted communities, and their correlating proposals, will be given adequate consideration.

Comment Received: Projects to strengthen coastal resilience against future flood damages should be prioritized through metrics the reflect their contribution to the socio-economic resilience of the community, region, and the state. Three critical resilience metric categories are essential when evaluating flood control and mitigation projects for coastal communities in a regional framework: (1) Economic Resilience. Where flood control and mitigation projects singularly affect a coastal community like Galveston, it is essential that the GLO heavily weigh economic sectors susceptible to flood hazards and assess the rippling impacts on the regional and state economy.

Staff Response: The Texas General Land Office recognizes the critical resilience metric categories described in this comment, but it should be noted that any factor used to select projects must be from data sets that exist across the impact area.

Comment Received: (2) Health and Human Safety. When evaluating human health and safety factors, the GLO should assess flood mitigation project impacts on reducing nutrients and pollutants to avoid conditions that impede and often reverse aquatic habitat restoration and water quality improvements.

Staff Response: The Texas General Land Office recognizes the critical resilience metric categories described in this comment, but it should be noted that any factor used to select projects must be from data sets that exist across the impact area.

Comment Received: (3) Property and Infrastructure Protections. Flood damages to residential and commercial properties create economic losses that impact and disrupt local economies and people directly.

Staff Response: The Texas General Land Office recognizes the critical resilience metric categories described in this comment, but it should be noted that any factor used to select projects must be from data sets that exist across the impact area.

Comment Received: The community of New Caney is experiencing new levels of flooding as development of the area continues. Please clean our ditches, our easements, repair our streets, place flood mitigation measures where they are needed, and building more retention ponds to compensate for the new levels of water caused by the new development.

Staff Response: The Texas General Land Office is not selecting projects on behalf of communities but all the activities discussed are generally eligible for CDBG-MIT funds. It is suggested these same comments be raised with City and County officials who will decide how to prioritize application submittals to the various GLO CDBG-MIT programs.

Comment Received: League City is building partnerships with Friendswood, Dickinson, HCFCD, Galveston County, and USACE on drainage issues for Clear Creek and Dickinson Bayou (Harris, Galveston, and Brazoria Counties). Initial study will start in October and complete in early 2021 with $100 million in projects expected.

Staff Response: The Texas General Land Office appreciates this update.

Comment Received: FEMA Region 6 Mitigation leadership would like to suggest the following resiliency measures for consideration: adopt a higher than FIRM/FIS standard map for floodplain management; adopt international codes (ASCE24) as the floodplain management building requirement rather than the minimum NFIP requirement; adopt a 'no net fill' floodplain ordinance element; and market/mandate flood insurance in communities, especially for structures that have previously claimed flood damage.

Staff Response: The Texas General Land Office recognizes and appreciates the informative feedback provided by FEMA Region 6 leadership. The mitigation measures proposed in this comment are all generally eligible for CDBG-MIT funds if communities pursue them for these purposes.

Comment Received: As a resident of Nederland, Texas, a community that has been impacted by both Hurricane Harvey and Tropical Storm Imelda, our local drainage district should do

more to mitigate flood risks moving forward. My primary concern is with Rodair Gully, a gravity flow drainage system within and maintained by Jefferson County Drainage District No. 7. This drainage system is in dire need of improvements and there should be consideration given to installing more pump systems upstream from those that currently exist.

Staff Response: The Texas General Land Office recognizes and appreciates the informative feedback provided in this comment and generally these activities are CDBG-MIT eligible. The commenter is encouraged to remain locally active in the CDBG-MIT process to ensure that these proposals are presented to local leadership for consideration for prioritization in coming applications.

Comment Received: We request the GLO adopt a CDBG-MIT award system based on risk. For flooding, risk is a function of increased rainfall intensity, the frequency of which has a high economic impact on the area. We would like to submit the regional stormwater infrastructure investment that depicts a combination of Harris County housing projects, Harris County Flood Control District and city locally funded infrastructure projects, and those eligible for CDBG-MIT funding. It is imperative that these proposed projects be included in the Action Plan to avoid the delay of submitting Action Plan amendments for such projects. We request the Texas Action Plan provide a line of credit or advance funding for project delivery to aid in the design and construction of infrastructure projects.

Staff Response: The Texas General Land Office has, as outlined in the draft Action Plan, set forth the scoring criteria associated with the award of grant funds under each individually proposed program. The proposal to submit a combination of Harris County housing projects, Harris County Flood Control District, and city funded local infrastructure projects must be done within the bounds of the process outlined in the Action Plan. The Texas General Land Office will base award of grant funds on the specific criteria associated with each program. The design and construction of infrastructure projects, if determined to be an eligible expense, may be reimbursed by grant funds once a contract is executed with any subrecipient. The Texas General Land Office cannot draw funds from the HUD CDBG-MIT program in advance of need.

Comment Received: I would like to suggest that a public commenter hearing be held somewhere in Central Texas, as meetings in Dallas and the coastal areas are too far to get adequate representation for areas that are included for funding under the Action Plan. Specifically, county roads (those not maintained by TXDOT) are in desperate need of funding to help add infrastructure and repair damages caused by prior storms. My particular county of concern is San Saba County and the northeast part of Mason County.

Staff Response: In meeting the public participation requirements of the Action Plan, the GLO has planned public hearings in several cities throughout Texas. One of those hearings was held on September 29, 2019, in the Capitol Complex in Austin.

Comment Received: As a concerned citizen and small business owner in Aransas County, I am writing to express my concern for the many unfunded or under-funded mitigation projects in my county. Aransas County was designated as most impacted and distressed and, it is my understanding, that at least 50% of the $4.297 billion in CDBG funds from HUD must be allocated within these areas. Of that 50%, it appears the GLO now seeks to designate half of this amount for statewide competition. Does this not defy the federal directive?

Staff Response: The Texas General Land Office remains committed to ensuring all CDBG-MIT programs are administered in accordance with all applicable law. This is inclusive of the mandate that at least 50% of the aggregate amount of CDBG-MIT funding be utilized in a manner that benefits the 20 counties and 10 ZIP codes designated by HUD as most impacted and distressed areas. The allocation of funding for an open statewide competition does not, absent a directive from the Department of Housing and Urban Development, negate this requirement.

Comment Received: Our community has developed and publicly adopted a Recovery Action Plan with projects to repair damage and improve resiliency for future events. Please help us complete these projects.

Staff Response: The Texas General Land Office remains committed to helping impacted communities develop programs and projects that mitigate the risk of damage from future natural disasters.

Comment Received: I want to thank you for listening to the needs of the coast and for the monies that have already been allocated to our communities. I look forward to the mitigation projects that will take place in Jim Wells.

Staff Response: The Texas General Land Office appreciates the support offered in this comment.

Comment Received: Local expertise, specifically from a professional engineer, should be heavily relied upon to determine cost reasonableness of submitted projects.

Staff Response: Cost reasonableness evaluations examine multiple factors to ensure that submitted projects are considered reasonable, given the details of that particular project. The Texas General Land Office remains committed to ensuring cost-reasonableness evaluations are done in the most equitable manner possible

Comment Received: Point scoring should include a given weight for projects included in any local planning document, not just projects included in the Local Hazard Mitigation Action Plan.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Will applications require cost estimates to be sealed by a licensed engineer? If so, can a third-party engineer hired by the applicant to assist the application be able to compete for design services associated with the project?

Staff Response: The application will likely include the need for participation from a licensed engineer in order to be compliant with 2 CFR 200 federal procurement requirements.

Comment Received: For cost verification, will there be a standard format, process, or criteria for the benefit-cost analysis?

Staff Response: More detail on the benefit cost analysis will be provided in the application guide and materials.

Comment Received: As it relates to scoring criteria, will partial points be awarded to applications that come close to achieving LMI goal of 50%? Or, in the alternative, is the scoring for LMI all or nothing?

Staff Response: An application is either LMI or not in CDBG; no partial points will be awarded for projects that are not at least 51% LMI.

Comment Received: As it relates to the coordination of mitigation projects and leverage of funding, if an applicant is a part of a regional project that is awarded funding, does that mean that all entities involved in the regional project will not be awarded funding for their other projects until all eligible applicants have been awarded funding at least once?

Staff Response: The limitation on number of applications per entity is being adjusted based on public comment. The Texas General Land Office will now allow each eligible entity to apply singly for no more than 3 applications and 3 additional applications in partnership with other eligible applicants in the Hurricane Harvey Competition.

Comment Received: If an applicant is part of a multi-jurisdictional application, are they then barred from submitting an application as a lone applicant? If so, how does this encourage the leveraging of funding?

Staff Response: The limitation on number of applications per entity is being adjusted based on public comment. The Texas General Land Office will now allow each eligible entity to apply singly for no more than 3 applications and 3 additional applications in partnership with other eligible applicants in the Hurricane Harvey Competition.

Comment Received: There is a discrepancy in language as page 196 of the Action Plan states 'at least 50%' of funds will be allocated for mitigation in HUD-identified most impacted and distressed while page 198 states 'up to 50%' of the allocation may be used to address mitigation needs. Does this mean that funds for mitigation in HUD identified areas are limited to 50% if 50% or 25% of the allocation for mitigation needs?

Staff Response: The language is indicating that the HUD-designated MID areas will receive at least 50% of the allocation and not less. Other eligible areas may receive the remaining 50% or less.

Comment Received: Galveston County has adopted updated Floor Insurance Rate Maps as of August 15, 2019. What would the elevation standards be for structures that were in the 100-yr floodplain at the time of Harvey but are no longer in the 100-yr floodplain and vice versa?

Staff Response: All CDBG-MIT program funds must comply with all local, state, and federal law at the time of implementation.

Comment Received: Page 192 of the Action Plan references the "annual floodplain." Should this be the '100-year floodplain'?

Staff Response: The reference to annual flood has been corrected to "base flood elevation" to match the language in the Federal Register notice.

Comment Received: Other federal grant programs permit subrecipients to self-certify their compliance with 2 CFR 200.318–326. Will the GLO have a method for subrecipients to self-certify as well?

Staff Response: This is outside the scope of the Action Plan.

Comment Received: Please define the differences between State and HUD MID (most impacted and distressed).

Staff Response: State impacted areas are counties with federal declarations for a particular funded event. HUD most impacted and distressed are defined by HUD directly.

Comment Received: Will LMI levels be factored regionally or locally? If both, how will this impact a project's timeline?

Staff Response: The Texas General Land Office will allocate all funds necessary to achieve the 50% LMI aggregate requirement before awarding any program funds from another eligible national objective.

Comment Received: When can non-LMI benefits be utilized (before, after, or during any LMI project implementation)?

Staff Response: More information is needed to answer this comment.

Comment Received: If the goal of 50% LMI is required, why does the scoring application not reflect the fact that most LMI persons reside in lower-valued/less densely populated areas? Current scoring reflects Project Impact (25 points) versus LMI Goal (20 points).

Staff Response: More information is needed to answer this comment.

Comment Received: Please expand the Building Resilient Infrastructure and Communities (BRIC) Program into 2020 and work to, if possible, coordinate CDBG funding and programs so these can roll out at the same time.

Staff Response: More information on the timing of applications will be coming out at a later date.

Comment Received: Please explain the method the state (GLO) will use to track and determine that a project will meet the necessary state LMI criteria when using the state as a whole in factoring LMI.

Staff Response: The Texas General Land Office will allocate all funds necessary to achieve the 50% LMI aggregate requirement before awarding any program funds from another eligible national objective.

Comment Received: Will the GLO foster agreements with the Public Utilities Commission and state communication companies if these types of projects are deemed suitable?

Staff Response: A full list of eligible entities will be provided in the application guides.

Comment Received: What is the GLO's projected timeline for getting funding data to the COGs for the creation of MODs?

Staff Response: Once the Action Plan is submitted to HUD, the Texas General Land Office will begin working with the COGs on MOD development.

Comment Received: Will the GLO liaison and coordinate with state and federal agencies to aid in the dredging, deepening and/or widening of Dickinson Bayou?

Staff Response: More information in needed to answer this comment.

Comment Received: Please share the methodology model/formula being used to justify the allocation of Hurricane Harvey funding to any given jurisdiction.

Staff Response: There is no methodology model/formula allocating funds to the jurisdiction level.

Comment Received: When will the GLO train subrecipients to use the GLO's proposed new project management system?

Staff Response: Subrecipients of the CDBG-DR 2015 and 2016 grants are already using the GLO system of record now. The application workshops and contract kickoff meetings are when most system training occurs.

Comment Received: Galveston County requests that written guidance and data sets for MOD creation be provided for prior review and approval before adoption.

Staff Response: Once the Action Plan is submitted to HUD, the Texas General Land Office will begin working with the COGs on MOD development.

Comment Received: Please define eligibility of funds for the management of operations and maintenance of a project.

Staff Response: Soft costs such as project management, design, and engineering are all eligible expenses associated with a grant subject to program caps.

Comment Received: The proposed program start date is 1 month after HUD's approval of the Action Plan; this fails to incorporate the time required to plan, process, and execute a multi-agency project while meeting GLO requirements. Please rethink the program timeline or give additional consideration to larger multi-agency projects.

Staff Response: The Texas General Land Office understands that many communities have already begun discussing opportunities to collaborate with other agencies. We would encourage others to do the same.

Comment Received: Please explain how a blighted home or structure is not an appropriate mitigation activity as the removal of blight is essential in reducing the amount of debris for future events.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received (multiple times): The public comment period should be extended to at least 60 days to provide a meaningful amount of time for stakeholders to evaluate and comment on this lengthy proposal. Given that the comment period began right before Thanksgiving and extends through the winter holidays, the amount of time allotted is notably short.

Staff Response: The Texas General Land Office remains committed to ensuring the satisfaction of all public participation requirements established under the federal rules. In compliance with those rules, the GLO has implemented the required 45-day public comment period along with a series of public hearings in various locations across Texas to give stakeholders every opportunity to submit feedback on the draft CDBG-MIT Action Plan.

Comment Received (multiple times): The Texas General Land Office should acknowledge the role that the climate crisis is playing in the increased severity and frequency of storms. The Texas General Land Office cannot adequate mitigate past harms or prepare for a resilient future without acknowledging the role of climate change.

Staff Response: The Texas General Land Office, as the primary administrator of CDBG-MIT funds, recognizes the pressing need to ensure communities are recovering, building in resiliency, and working to activity mitigate the risk of impact for future disaster events.

Comment Received (multiple times): The Texas General Land Office should examine the role that clean energy and electric vehicles could play in recovery.

Staff Response: It is imperative that funding under the CDBG-MIT allocation is used in the most effective and efficient manner possible. Innovative solutions that work to achieve these goals are encouraged and will be given adequate consideration during the application process.

Comment Received (multiple times): The Texas General Land Office should ensure that application procedures for local jurisdictions are neither biased nor burdensome. The Texas General Land Office should not favor some applicants over others and should create a process that allows recovery funding to flow where it is most needed.

Staff Response: Project application criteria is outlined in the CDBG-MIT draft Action Plan.

Comment Received: The Texas General Land Office should consider rooftop solar paired with batteries to aid with storm recovery.

Staff Response: It is imperative that funding under the CDBG-MIT allocation is used in the most effective and efficient manner possible. Innovative solutions that work to achieve these goals are encouraged and will be given adequate consideration during the application process.

Comment Received: Officials from the Houston area have expressed concern that limits on the size and number of applications will make it difficult for larger jurisdictions to get what they need.

Staff Response: The Texas General Land Office, in response to the public comment process, is considering altering both the cap on awards per application and the cap on the number of applications eligible to be submitted by each entity. For clarification on both of these points, see the Action Plan.

Comment Received: The Houston/Harris County area should receive more funds than are currently proposed by the GLO. Why are entities limited to three projects if the State wishes to spread mitigation dollars broadly?

Staff Response: The Texas General Land Office, in the interest of administering CDBG-MIT funds in a manner consistent with the goals presented by HUD, has proposed the allocation percentages and project limits in an effort to meet those goals.

Comment Received: Houston and Harris County should not be penalized if they seek to submit joint projects. The Texas General Land Office should not require the completion of one project in order to start another. The Texas General Land Office should consider both the population of the number of people impacted and the percentage of people who have been impacted when evaluating projects.

Staff Response: Any requirements imposed upon applicants have been made in an effort to ensure that CDBG-MIT funds are used as widely as possible across the areas designated by HUD while also ensuring subrecipients who already have previous program funds are expending those funds appropriately. The Texas General Land Office appreciates the feedback presented in this comment and will give all aspects adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: During the public hearing on December 11, 2019, the 306-page Action Plan document was reduced to a few slides and summarized in under an hour. Whoever put their name to this document should be embarrassed because it is nothing more than a political hatchet job. The Action Plan established so many road blocks and disables a truly comprehensive drainage plan to really mitigate the flooding problem in Harris, Fort Bend, Galveston, and surrounding counties.

Staff Response: The Texas General Land Office remains steadfast in its commitment to ensuring all Action Plans are drafted in accordance with the applicable federal law. Should any aspect of the current CDBG-MIT draft Action Plan be deemed inadequate by HUD, the GLO would work diligently to ensure revisions to any of those potentially identified inadequacies. This agency remains committed to the effective and efficient recovery of Texans and is willing to make necessary revisions should they be required.

Comment Received (multiple times): Please extend the public comment period to January 13, 2020, to account for public holidays and give respondents across the state adequate time to comment.

Staff Response: The Texas General Land Office remains committed to ensuring the satisfaction of all public participation requirements established under the federal rules. In compliance with those rules, the GLO has implemented the required 45-day public comment period along with a series of public hearings in various locations across Texas to give stakeholders every opportunity to submit feedback on the draft CDBG-MIT Action Plan.

Comment Received: The state needs to do a meaningful assessment of future conditions, including sea level rise, as required by HUD. Likewise, as proposed, projects funded by CDBG-MIT will be undertaken without consideration of future risks which is a problem that must be corrected. While the GLO is encouraging applicants to leverage CDBG-MIT dollars, the state could do more to document how it is leveraging other state and federal dollars in tracking successes.

Staff Response: All environmental, USACE, local, state, and federal permitting will be required for any projects funded by MIT funds.

Comment Received: More should be done to encourage applicants to make permanent changes to policies, programs, or plans that will lower the vulnerability of communities and

the state to future natural hazards and climate impacts. The Texas General Land Office must also require applicants to fully consider future risks, including consideration of climate impacts, when updating those policies, programs, or plans.

Staff Response: The Texas General Land Office recognizes the issues presented in this comment and will give each point adequate consideration as programs and policies for CDBG-MIT purposes develop.

Comment Received: Priority for funding should be given to applicants that have: (a) updated applicable policies, programs, or plans, (b) initiated such actions at the time of their application for CDBG-MIT funds, or (c) are pursuing funds through CDBG-MIT for that purpose. Buyout projects are an important component for the draft Action Plan that we support.

Staff Response: The Texas General Land Office recognizes the issues presented in this comment and will give each point adequate consideration as programs and policies for CDBG-MIT purposes develop.

Comment Received: Why is Harris County only getting 8% of the $4.3 billion in federal funds? This is unfair and not proportional to the need and percentage of folks affected.

Staff Response: Harris County is eligible to participate in most of the various MIT programs. No amount has been set or awarded specifically for the county.

Comment Received: I ask for a 2-week extension for public comment on the GLO's proposal as most of us are trying to focus on family during the holiday season. More time is needed to allow people to read the document and comment.

Staff Response: The Texas General Land Office remains committed to ensuring the satisfaction of all public participation requirements established under the federal rules. In compliance with those rules, the GLO has implemented the required 45-day public comment period along with a series of public hearings in various locations across Texas to give stakeholders every opportunity to submit feedback on the draft CDBG-MIT Action Plan.

Comment Received: Harris County and Beaumont area suffered far more serious overall damage than some of the other areas receiving aide and Harris County should greater share because of the greater need.

Staff Response: The Texas General Land Office has conducted extensive analysis, as presented in the draft Action Plan, to ensure that CDBG-MIT funds are allocated in a manner that works to equitably address mitigation needs across the areas defined by HUD.

Comment Received: Is it anticipated that contractors will be utilized or will the GLO conduct these in-house with current staff and/or hire new staff to conduct AFFH reviews?

Staff Response: The Texas General Land Office, as the primary administrator of CDBG-MIT funds, will conduct Affirmatively Furthering Fair Housing reviews, either internally or through a subcontractor with GLO oversight.

Comment Received: What is the anticipated period of performance for the projects under the 2015 Floods State Mitigation Competition once they are awarded to subrecipients?

Staff Response: The performance period of any given contract awarded under the 2015 Floods State Mitigation Competition will align with both the HUD requirement contract period and be tailored as reasonable for the given project.

Comment Received: Traditionally the performance period for large-scale mitigation projects begins once funds are awarded to the subrecipient instead of when the application period opens. It is concerning that large-scale projects are not given differing time considerations given their complexity. How will the GLO conduct the required AFFH Review on each proposed project?

Staff Response: All Affirmatively Further Fair Housing Reviews will be conducted by the GLO, either internally or through the use of a contracted party, in accordance with applicable law.

Comment Received: Is there a match requirement for subrecipients?

Staff Response: There is not a match requirement for CDBG-MIT funds, but some programs will give points for leveraging other resources.

Comment Received: The Texas General Land Office has proposed a [HMGP: Supplemental] program end date of 4 years from the start date. Does this mean that 4 years from the application period opening that ALL projects must be completed?

Staff Response: The Texas General Land Office has proposed and anticipates that the HMGP Supplemental Program will end within a 4-year period, absent any expressly granted extensions.

Comment Received: Thank you for your efforts in creating the CDBG-MIT Action Plan. I have been particularly impressed by Sections 4.4.4 and Figure 6-3 of Appendix C. However, I believe the quarterly budgets should be revised to reflect a quick ramp up (within 2 quarters), a plateau (3 or so years), and a gradual ramp down (project wrap up).

Staff Response: The Texas General Land Office would like to thank the commenter for the positive feedback. The Texas General Land Office also recognizes and appreciates the feedback

to potentially revise quarterly budgets to reflect a three-phase approach and will give this idea adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Current HMGP applicants that did not receive funding from TDEM and will receive money from the GLO should be allowed to retain their current grant administrator and not have to re-procure.

Staff Response: All program funds are subject to federal procurement requirements. If an applicant followed the applicable procurement regulations, they may not have to re-procure a new vendor.

Comment Received: Applicants should be allowed to exceed the 15% engineering cap if the difference is paid with local funds, not those funds allocated by the GLO. Grant administrative fees should either increase to 6% or Environmental costs should be removed from Project Delivery fees.

Staff Response: Details of any program supportive cost caps will be fully defined in the application guides.

Comment Received: The Texas General Land Office should explain how it conducted a Cost Price Analysis to determine allowable Administration, Project Delivery, and Engineering fees.

Staff Response: Details of any program supportive cost caps will be fully defined in the application guides.

Comment Received: The infrastructure competitive scoring criteria should include points for joint proposals that collaborate with surrounding communities.

Staff Response: Details of any program supportive cost caps will be fully defined in the application guides. The Texas General Land Office has worked to draft all scoring criteria.

Comment Received: GrantWorks staff should be removed from the GLO's office location as it gives them an unfair advantage in bidding to grant administrators for communities who are applying for funding in the competitive process.

Staff Response: The Texas General Land Office remains committed to following the procurement rules established at 2 C.F.R. 200, including any and all conflict of interest issues that may arise during program implementation.

Comment Received: Smaller communities should be permitted to apply for less than the $3 million minimum. The infrastructure application should be revised, updated, and improved to include all required information at the beginning of the process, not the end.

Staff Response: The Texas General Land Office will be adjusting the program minimums for the Hurricane Harvey Competition as a result of public comment. The Texas General Land Office is working to update applications and application guides to reflect the CDBG-MIT requirements.

Comment Received: We believe the eligibility requirements for CDBG-MIT funds may be too restrictive. Essential infrastructure required for the full function of our organization, like waterproof fuel reservoirs and windstorm proof hangars, is not currently eligible for CDBG-MIT funding. Funding these types of projects will mitigate future risk as our ability to provide emergency treatment and transport, regardless of ability to pay, will be greatly enhanced.

Staff Response: The Texas General Land Office recognizes this comment and appreciates how these funds would assist an organization like HALO-Flight. Only in rare exceptions are nonprofit entities considered as a subrecipient of CDBG funds. More often, nonprofits participate in these programs as contractors or grant administrators. However, many types of public service districts and jurisdictions are eligible for Hurricane Harvey-related mitigation funding in our State Action Plan, depending on the program. We would encourage you to partner with one or more of these jurisdictions and apply to the program which you feel best meets your needs.

Comment Received: The Texas General Land Office should seriously consider restructuring the CDBG-MIT Action Plan to proportionately distribute the funds to areas most severely impacted by Hurricane Harvey. On top of proposing a clearly unequal funding distribution, the GLO has set the public comment period during the holidays which is simply rude. Everyone interested in fairness believes there should be at least at wo week extension for public comment.

Staff Response: The Texas General Land Office remains committed to ensuring the CDBG-MIT Action Plan reflects policies and procedures that fall within the bounds of the rules and regulations promulgated by HUD, In compliance with those rules, the GLO has implemented the required 45-day public comment period along with a series of public hearings in various locations across Texas to give stakeholders every opportunity to submit feedback on the draft CDBG-MIT Action Plan within the submission requirements set by HUD.

Comment Received: Port Lavaca Water Treatment Plant: a new water treatment plant should be constructed at the current plant site that hardens vital structures. A berm should also be constructed around the plant site to protect the area from storm surge. Lower Guadalupe River Diversion System, a surface water conveyance system located in the Lower Guadalupe River Delta in Calhoun and Refugio counties, should be improved as follows: Replacement of radial gates on the Goff Bayou Control Structure; replacement and relocation of the Hog Bayou Control Structure; and repair breaches in earthen levees that comprise the Diversion System. It should be noted that the above-listed projects can be packaged as one project.

Staff Response: The Texas General Land Office recognizes the projects presented under this comment and strongly encourages the GBRA to apply for them in the CDBG-MIT competition(s).

Comment Received: The Resilient Home Program's emphasis on cost-effective enhanced resiliency features is a welcome step towards promoting better construction techniques through the construction industry, which is sorely needed. We ask that the GLO ensure that any further Resilient Housing Program construction requirements encourage the use of innovative technologies.

Staff Response: The Texas General Land Office recognizes and appreciates this comment and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The Texas General Land Office should draft these requirements in a manner that gives industry-changing construction techniques a real opportunity to participate in demonstrating cost-effectiveness and speed of construction at scale, as proposed in the Action Plan.

Staff Response: The Texas General Land Office recognizes and appreciates this comment and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: FEMA Community Lifelines in the Action Plan should be updated to reflect the Community Lifelines Toolkit 2.0. Although we applaud the inclusion of the FEMA Community Lifelines into the Action Plan, it should be noted that these are designed for disaster response operations and not for mitigation. The Action Plan should be updated to reflect that housing risks and impacts are a direct component of FEMA Lifelines under "Shelter" and "Food, Water, Shelter" in version 2.0.

Staff Response: The Texas General Land Office followed the required format for the Action Plan development as outlined in the Federal Register.

Comment Received: For areas not considered HUD/State MID, but their project impacts a HUD MID or State MID area, will that HUD MID/State MID be notified of the project?

Staff Response: The Texas General Land Office is encouraging collaboration between communities. Details related to application specifics will come out in the application guide and applications.

Comment Received: If a jurisdiction submits an application that is completed within that jurisdiction but can show benefit to a neighboring jurisdiction, is that considered a regional project or a lone project?

Staff Response: The Texas General Land Office is encouraging collaboration between communities. Details related to application specifics will come out in the application guide and applications.

Comment Received: Does the 50% LMI apply across the total CDBG-MIT allocation (not by project)? How much of the current HAP and Resilient Home Program counts towards that 50% LMI?

Staff Response: The 50% LMI aggregate requirement is on the entire CDBG-MIT allocation. The 50% LMI aggregate requirement must be met within the CDBG-MIT funds.

Comment Received: More than 13% of the total allocation will go to assistance to homeowners through the reconstruction of homes, but the total of the Housing Oversubscription Supplemental Program and the Resilient Home Program is only 11.64%. Where is the additional 1+%? 68% of funds will address hazard mitigation needs related to local and regional mitigation activities.

Staff Response: More information is needed to respond to the comment.

Comment Received: The total of the 2015, 2016, and Harvey Competitions, the Regional Mitigation Program, HMGP Supplemental program, and Coastal Resiliency Program adds up to 72.35%. Is there a discrepancy?

Staff Response: More information is needed to respond to the comment.

Comment Received: Page 208 does not mention how much is allocated for planning activities. For the 2015 and 2016 Competitions, does 'units of local government' only refer to cities and counties or does it also apply to political subdivisions under those jurisdictions, such as drainage districts? For the 2015 and 2016 State Competitions, applicants should be able to submit 2 individual applications in addition to 1–2 regional/joint applications.

Staff Response: The Program Budget table on page 201 defines planning to be $214,859,450. Only cities, counties, and COGs are eligible to apply for the 2015 and 2016 State Mitigation Competitions**.**

Comment Received: Regarding the Harvey Competition, applicants should be able to submit up to 3 individual applications in addition to 1–2 regional/joint applications.

Staff Response: Based on public comment the GLO is amending the application process for the Hurricane Harvey State Mitigation Competition.

Comment Received: Pages 211 and 218 should define 'storms' as 'hurricanes, tropical storms, and depressions' as stated at the beginning of the Action Plan.

Staff Response: Thank you for this feedback.

Comment Received: Table 4-2 provides ranks for the County Composite Index, Social Vulnerability Index, per capita market value, but those ranks are not directly correlated to any date in the plan. Page 162 the legend shows 'ranking' but does not describe which is considered 'Rank 1, Rank 2, etc.'; Page 164 the legend shows 'Rating' of 'High' and 'Medium', but how does this correlate to 'Rank 1, Rank 2'?; Page 165 the legend shows the per capital market value but does not correlate that to any of the rankings used in the scoring criteria.

Staff Response: Thank you for this feedback**.** The ranks will be clarified for the County Composite Disaster Index, Social Vulnerability Index, and per capita market value in the scoring criteria.

Comment Received: Do applicants need to prioritize/rank their applications for the competitions? Who/how is it determine which applications fall within which round?

Staff Response: No, applicants' applications will be evaluated based solely on score. Any applications submitted will be considered under the open application cycle.

Comment Received: Will units of local governments be able to access the data sets provided to the COGs for the development of their MODs under the Regional Mitigation Program? The Regional Mitigation Program should be clarified as being specifically for Harvey allocations. For the Regional Mitigation Program: will areas outside of the HUD/State MID submitting applications be required to do an interlocal agreement or MOU with the impacted area? Will any financial support be provided to the COGs to develop the MODs?

Staff Response: Once the Action Plan is submitted to HUD for review the GLO will begin working with the COGs to begin work on the MODs. Thank you for this feedback. Details related to application specifics will come out in the application guide and applications. The COGs will receive funds for their participation in the MOD development.

Comment Received: Will applicants know prior to submitting applications to the GLO which projects will be selected under HMGP Supplemental Program and/or the Coastal Resiliency Program?

Staff Response: The Texas General Land Office is working with both TDEM and the GLO Coastal division now to determine which projects will be funded under these programs. Once the list is available it will be posted to the GLO website and communities will be notified.

Comment Received: What are the timelines for project selection under the HMGP Supplemental Program and the Coastal Resiliency Program?

Staff Response: The Texas General Land Office is working with both TDEM and the GLO Coastal division now to determine which projects will be funded under these programs. Once the list is available it will be posted to the GLO website and communities will be notified.

Comment Received: Do residents have to have already applied to be a part of the HAP Program to receive assistance under the HAP Supplemental Program or are you allowing addition applications to be submitted?

Staff Response: Applications have come to a conclusion for the Homeowner Assistance Program; no further applications are being accepted.

Comment Received: How much of the Hazard Mitigation Planning funding is going to the State (TDEM) to develop and maintain an enhanced Mitigation Plan?

Staff Response: No amount has been defined to update the State Hazard Mitigation Plan.

Comment Received: Appendix F states that 80% of funds go towards HUD MID areas with the remaining 20% of the funds to go towards State MID areas; however, it looks like the allocation is split 50%/50%. Does this language need to be updated? If not, clarification is needed.

Staff Response: The Regional Methods of Distribution was allocated to the regions using a 80% HUD MID/20% Sate MID split.

Comment Received: In the Composite Disaster Index on page 161, why is wildfire rated higher than major river crests? This needs to be reexamined in light of the purpose of mitigation funding.

Staff Response: According to FEMA, there is a severe increased risk of flooding and flash flooding up to 5 years after a wildfire due to the change in the terrain and making the ground less able to absorb water.

Comment Received: Harris County believes that the CDBG-MIT Action Plan has failed to provide it with adequate funding as it is (a) limited to submitting 2 to 3 applications for projects under the 2015, 2016, and 2017 funding competitions, and (b) limited to a possible COG-based allocation from the underfunded and crowded H-GAC Method of Distribution. Harris County recommends that the GLO provide a direct allocation/set aside to Harris County to address locally identified mitigation needs via a method similar to CDBG-DR Hurricane Harvey Round One allocation.

Staff Response: The Texas General Land Office is updating the number of applications allowable under the Hurricane Harvey State Mitigation Competition. The decision has been made that no

direct allocations will be done from the MIT funds in recognition of the need to do larger, more regional mitigation efforts.

Comment Received: Harris County recommends that the GLO increase the set aside for HUD MID areas from 50% of the allocation to 65% of the allocation. Harris County recommends additional funding for the H-GAC region as several of the Top 10% counties in the Composite Disaster Index are within the H-GAC jurisdiction.

Staff Response: The 50% set aside for the most impacted and distressed areas designated by HUD is straight from the Federal Register requirements. The language indicates not less than 50% be spent in HUD MID areas and the GLO will ensure that is the case. The allocations to the COG regions are based on an overall risk calculation with consideration for the Composite Disaster Index as a component.

Comment Received: Section 4.4: GLO Use of Funds: The CDBG-MIT Action Plan fails to set aside funding that will alleviate flooding in one of the highest flood-prone and populous areas of the state—Harris County. Instead, the state has limited the number of applications per jurisdiction to 2, with no award for a second application possible until "all successful eligible applicants have been awarded funding at least once." This does not fully address risks for highly impacted areas as stated by the GLO.

Staff Response: The Texas General Land Office is updating the way the awards will be allocated for second projects to a single applicant. The Texas General Land Office is updating the number of application eligible entities may submit under the Hurricane Harvey Competition.

Comment Received: Harris County recommends that the State allow HUD MID jurisdictions to submit up to three applications as lead agency for the project and not penalize jurisdictions that are in a collaborative as a secondary member (not the lead agency) by counting the application as one of the three. The County recommends the deletion of the narrative preventing the same project submitted in the three competitions.

Staff Response: Further information about the CDBG-MIT competitions will be provided in the applications and application guides. Additional information will be provided in the updated Action Plan and application guides pertaining to the calculations and definitions of the scoring criteria.

Comment Received: The Texas General Land Office should as to which year of funding the project is eligible and then the GLO could fund as best for the process. Section 4.4.1.9: Selection Criteria Under Table 4-2, 2015 Flood Competitions Scoring Criteria, Harris County recommends defining the ranking levels. The Texas General Land Office should clarify what "Tie-Breaker: Poverty Rate" means as it relates to the selection criteria. The Texas General Land Office should clarify a "Project Identified in Local Adopted Plan." Does this mean the project should be named or will identifying the risk and mitigation activity

suffice? The Texas General Land Office should clarify what method it will use for a Social Vulnerability Index and per capita market value. The Texas General Land Office should clarify how the "Cost per persons benefitting" criteria will not unduly penalize low-income communities, who often have a lower cost/benefit versus higher income communities.

Staff Response: Further information about the CDBG-MIT competitions will be provided in the applications and application guides. Additional information will be provided in the updated Action Plan and application guides pertaining to the calculations and definitions of the scoring criteria.

Comment Received: Section 4.4.1.12: AFFH Review: This section states, "Applications should show that projects are likely to lessen area racial, ethnic, and low-income concentrations, and/or promote affordable housing in low-poverty, non-minority areas. . ." The Texas General Land Office appears to be steering projects to only high-income and non-minority areas. Harris County recommends adding language that supports and promotes projects that bring equity and revitalization to low-income communities.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible.

Comment Received: Section 4.4.2: 2016 Floods State Mitigation Competition: The State Action Plan fails to set aside funding that will alleviate flooding in one of the highest flood-prone and populous areas of the state—Harris County. Instead, the state has limited the number of applications per jurisdiction to 2 with no award for a second application possible until "all successful eligible applicants have been awarded funding at least once." This does not fully address risks for highly impacted areas as stated by the GLO.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Harris County recommends that the state allow HUD MID jurisdictions to submit up to 4 applications as lead agency for projects and not penalize jurisdictions that are collaborating as a secondary member (not the lead agency) by counting the application as 1 of 4. The county recommends the deletion of the narrative preventing the same project submitted in the three competitions.

Staff Response: The Texas General Land Office is updating the number of applications allowable under the Hurricane Harvey Competition.

Comment Received: Section 4.4.2.9: Selection Criteria Under Table 4-3, 2016 Flood Competition Scoring Criteria, Harris County recommends defining ranking levels.

Staff Response: Further information about the CDBG-MIT competitions will be provided in the applications and application guides.

Comment Received: Under Management Capacity, the statement by the GLO is "No prior or current contracts with GLO (proposed grant management plan)." How does having no prior or current CDBG contacts show high Management Capacity? The Texas General Land Office should clarify this statement. The Texas General Land Office should clarify what "Tie Breaker: Poverty Rate" means as it relates to the selection criteria. Does GLO mean that areas of high poverty are not as desirable for CDBG-MIT funding?

Staff Response: Further information about the CDBG-MIT competitions will be provided in the applications and application guides. The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible.

Comment Received: Section 4.4.2.11: AFFH Review: This section states, "Applications should show that projects are likely to lessen area racial, ethnic, and low-income concentrations, and/or promote affordable housing in low-poverty, non-minority areas. . ." The Texas General Land Office appears to be steering projects to only high income and non-minority areas. Harris County recommends adding language that supports and promotes projects that bring equity and revitalization to low-income communities, particularly that improve conditions and reduce risk in the area.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible.

Comment Received: Section 4.4.3: Hurricane Harvey Mitigation Competition: The Action Plan fails to set aside funding that will alleviate flooding in one of the highest flood-prone and populous areas of the State—Harris County. Instead, the State has limited the number of applications per jurisdiction to 2, with no award for a second application possible until "all successful eligible applicants have been awarded funding at least once." This does not fully address risks for highly impacted areas as stated by the GLO.

Staff Response: The Texas General Land Office is updating the number of applications allowable under the Hurricane Harvey State Mitigation Competition.

Comment Received: Harris County recommends that the state allow HUD MID jurisdictions to submit up to 3 applications as lead agency for the project and not penalize jurisdictions that are in a collaborative as a secondary member (not the lead agency) by counting the application as 1 of the 3. The county recommends the deletion of the narrative preventing the same project submitted in the three competitions. The Texas General Land Office should

ask to which year of funding the project is eligible and then the GLO could fund as best for the process.

Staff Response: The Texas General Land Office is updating the number of applications allowable under the Hurricane Harvey State Mitigation Competition.

Comment Received: Section 4.4.3.2: Covered Projects: Harris County and its regional partners have identified several mitigation projects that meet the definition as "Covered Projects." The mitigation needs, complex infrastructure, and population center of Harris County is best served by such projects; however, the Action Plan clearly acknowledges that such projects will require an amendment to the State Action Plan since there is no consideration provided for inclusion in the initial plan. Harris County strongly encourages and recommends the inclusion of Covered Projects for early consideration with an amendment process to begin as soon as the State's CDBG-MIT Action Plan is approved by HUD. Further, the county recommends that the Action Plan include an amendment process that prioritizes the inclusion of "Covered Projects" from HUD MID areas first. These improvements to the Action Plan will allow Covered Projects to be implemented on a timeline to ensure completion within plan and federally required timelines.

Staff Response: To meet the required deadlines for submission of the Action Plan there was not enough time to fully consider specific projects. Any Covered Projects awarded through a competition or COG MOD will be written into a future Action Plan amendment. Due to the complexity of such a project, the timing should not be prohibitive to the overall completion.

Comment Received: Section 4.4.3.3: Allocation Amount in item iii: the State's Action Plan allows for non-HUD MID and non-State MID area applicants to access Hurricane Harvey CDBG-MIT funding if their project will 'measuredly mitigate risk" to HUD and State MID areas, but does not detail if the application would also count against the HUD or State MID's limited number of applications as these jurisdictions must enter into an interlocal agreement regarding the project. The Texas General Land Office should clarify what level of "measuredly mitigate risk" will be acceptable.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Section 4.4.3.10: Selection Criteria: Table 4-4, Hurricane Harvey Competition Scoring Criteria: Harris County recommends defining the ranking levels. The Texas General Land Office should clarify what "Tie-Breaker: Poverty Rate" means as it relates to the selection criteria. The Texas General Land Office should clarify a "Project Identified in Local Adopted Plan." Does this mean the project should be named or will identifying the risk and mitigation activity suffice? The Texas General Land Office should clarify what method it will use for a Social Vulnerability Index and per capita market value.

The Texas General Land Office should clarify how the "Cost per persons benefitting" criteria will not unduly penalize low-income communities, who often have a lower cost/benefit versus higher income communities.

Staff Response: Further information about the CDBG-MIT competitions will be provided in the applications and application guides. The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible**.**

Comment Received: Section 4.4.3.12: AFFH Review: This section states, "Applications should show that projects are likely to lessen area racial, ethnic, and low-income concentrations, and/or promote affordable housing in low-poverty, non-minority areas. . ." The Texas General Land Office appears to be steering projects to only high income and non-minority areas. Harris County recommends adding language that supports and promotes projects that bring equity and revitalization to low-income communities, particularly that improve conditions and reduce risk in the area.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible.

Comment Received: Section 4.4.4: Regional Mitigation Program (COG MOD): Harris County recommends additional funding for the Houston-Galveston Area Council region as several of the Top 10% counties in the Composite Disaster Index are within the H-GAC jurisdiction.

Staff Response: The allocations to the COG regions are based on an overall risk calculation with consideration for the Composite Disaster Index as a component.

Comment Received: Section 4.4.4.6: Eligible Activities: Harris County recommends that for those jurisdictions who have operated a HUD housing program with CDBG-DR funds in the past 5 years be allowed to operate, as an eligible activity, an owner-occupied housing rehabilitation and reconstruction program.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Section 4.4.4.11 AFFH Review: This section states, "Applications should show that projects are likely to lessen area racial, ethnic, and low-income concentrations, and/or promote affordable housing in low-poverty, non-minority areas. . ." The Texas General Land Office appears to be steering projects to only high income and non-minority areas. Harris County recommends adding language that supports and promotes projects

that bring equity and revitalization to low-income communities, particularly that improve conditions and reduce risk in the area.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible.

Comment Received: Section 4.4.7: Housing Oversubscription Supplemental: Harris County recommends the deletion of the sentence that prohibits homeowners located in the city of Houston and Harris County from participating in this program. By prohibiting Harris County residents, the state is creating an inequitable use of funding and treatment of the county's low-income population. The Texas General Land Office should add 'rehabilitation' to this program description to serve all homeowners affected, either with minor or severe damage, by past disaster events.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible.

Comment Received: Section 4.4.7.4: Eligible Activities: Harris County recommends that the GLO add 'rehabilitation' that also improves existing housing damaged by Hurricane Harvey.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible.

Comment Received: Section 4.4.7.5: Ineligible Activities: Harris County recommends deletion of item x., which prohibits city of Houston and/or Harris County homeowners from participating in this program. By prohibiting Harris County residents, the state is creating an inequitable use of funding and treatment of the county's low-income population.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible.

Comment Received: Section 4.4.7.12: AFFH Review: This section states, "Applications should show that projects are likely to lessen area racial, ethnic, and low-income concentrations, and/or promote affordable housing in low-poverty, non-minority areas. . .". This statement does not take into account projects that bring equity to low-income, often minority concentrated areas that have historically been overlooked by FEMA mitigation programs. The Texas General Land Office appears to be steering projects to only high

income and nonminority areas. Harris County recommends adding language that supports and promotes projects that bring equity and revitalization to low-income communities, particularly that improve conditions and reduce risk in the area.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible.

Comment Received: Section 4.4.8: Resilient Home Program: Harris County recommends the deletion of the sentence that prohibits homeowners located in the city of Houston and Harris County from participating in this program. By prohibiting Harris County residents, the state is creating an inequitable use of funding and treatment of the county's low-income population. The Texas General Land Office should add 'rehabilitation' to this program description to serve all homeowners affected, either with minor or severe damage, by past disaster events.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible.

Comment Received: Section 4.4.7.4: Eligible Activities: Harris County recommends that the GLO add 'rehabilitation' that also improves existing housing damaged by Hurricane Harvey. We also recommend that in Section 4.4.7.5: Ineligible Activities, the deletion of item viii., which prohibits city of Houston and/or Harris County homeowners from participating in this program. By prohibiting Harris County residents, the state is creating an inequitable use of funding and treatment of the county's low-income population.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible.

Comment Received: Section 4.4.7.12: AFFH Review: This section states, "Applications should show that projects are likely to lessen area racial, ethnic, and low-income concentrations, and/or promote affordable housing in low-poverty, non-minority areas. . ." The Texas General Land Office appears to be steering projects to only high income and non-minority areas. Harris County recommends adding language that supports and promotes projects that bring equity and revitalization to low-income communities, particularly that improve conditions and reduce risk in the area.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that both aligns with HUD rules and regulations and fosters the most effective and efficient recovery possible.

Comment Received: Section 6.4.2: Consultations, Table 6-3, 2019 GLO Mitigation Outreach Efforts: This contains a list of the stated outreach efforts for the CDBG-MIT Action Plan. Numerous meetings/outreach events were conducted, but no specific Harris County outreach event was conducted for county local government officials or the general public. Harris County recommends the GLO conduct a Harris County outreach event targeting officials, local governments, area agencies, nonprofits, and the general public to provide guidance and allow additional input on the CDBG-MIT Action Plan.

Staff Response: The Texas General Land Office held a public hearing in Houston and has continued with consultations since the drafting of the Action Plan.

Comment Received: We believe the Regional Mitigation Program is significantly underfunded. We recommend the Regional Mitigation Program be funded at $2,144,776,720, and the Hurricane Harvey State Mitigation Competition be funded at $500,000,000, which would essentially switch the funding for the two programs.

Staff Response: H-GAC and all the other COGs in the Harvey impact area will be eligible applicants to the Hurricane Harvey Competition and the GLO encourages them to consider regional efforts that may fit within the scope of the COG for application.

Comment Received: H-GAC encourages the GLO to not limit the number of applications a jurisdiction may submit nor delay funding awards to impacted communities and to award funding for the highest scoring applications in these competitions to allow the best, most viable projects to be implemented to mitigate future natural disasters.

Staff Response: The number of applications allowed for the Hurricane Harvey State Mitigation Competition is going to be updated in the final Action Plan.

Comment Received: We encourage the GLO to give a high priority to multi-jurisdictional collaboration in the competitive funding categories and recommend assigning points in the scoring criteria for such projects.

Staff Response: Applicants will be able to submit more applications by partnering with other entities.

Comment Received: We recommend that a local government's participation in a joint application should not count towards its maximum number of funded projects and that additional clarification is needed on what constitutes a joint application. In order to meet the goal of spending 50% of the funds within 6 years and 100% within 12 years, H-GAC strongly encourages the GLO to not state the application process for various programs, but to operate from a single timeline to deploy funding.

Staff Response: The number of applications allowed is going to be updated in the final Action Plan. Timing of all programs being offered is still be considered though the GLO agrees that the need for expediency is critical.

Comment Received: We recommend the GLO develop a pre-application process to help applicants better prepare their materials for submission and provide the GLO with a larger, more comprehensive list of projects that could be quickly categorized and prioritized for funding based on factors such as beneficiary income requirements.

Staff Response: The application guide and applications are going to be a simple as possible to meet scoring requirements with additional information to be provided after an initial review wherever possible.

Comment Received: Councils of Governments are uniquely situated and the GLO should take advantage of our knowledge, expertise in disaster recovery, decades of experience implementing complex federal and state funded programs, and long-standing local government relationships to provide a conduit for providing feedback to senior GLO staff and troubleshoot any problems as the various programs are implemented.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: We expressly supports the initiatives by the GLO to streamline the application process and mitigate the burden of applying for the CDBG-MIT funds for local governments.

Staff Response: Timing of all programs being offered is still be considered though the GLO agrees that the need for expediency is critical. The application guide and applications are going to be as simple as possible to meet scoring requirements with additional information to be provided after an initial review wherever possible.

Comment Received: We strongly supports the GLO efforts to encourage and incorporate nature-based solutions in all of the funding competitions.

Staff Response: The Texas General Land Office appreciates the support in efforts being made to ensure nature-based solutions are eligible uses of the HUD CDBG-MIT funding.

Comment Received: We support the GLO's efforts to bring the State Hazard Mitigation Plan to Enhanced status and provide funding for Local Hazard Mitigation Action Plans, and the integration of hazard mitigation into comprehensive plans, land use plans, building code updates, and zoning/ordinance changes.

Staff Response: The Texas General Land Office appreciates the support of planning efforts from the HUD CDBG-MIT funding.

Comment Received: Regarding overall eligibility, Tarrant and Dallas Counties are not currently included as eligible for Harvey Mitigation Funding; however, they were included in the Presidential disaster declaration. These two large counties should be considered for funding.

Staff Response: The Texas General Land Office will look into this but eligible areas are defined by HUD.

Comment Received: Non-coastal communities should be the best areas of focus for resiliency efforts as restricting development along the coastline is the best way in which to mitigate damages from future storms.

Staff Response: Projects outside of the defined declaration area may be eligible if they can be shown to benefit areas covered.

Comment Received: Regarding the 2015/2016 Floods State Mitigation Competitions: We would like a clarification of the term "project" and whether or not one project within an application can encompass multiple eligible activities and locations in one application.

Staff Response: The Texas General Land Office will be further defining the details of the scoring criteria in the final Action Plan. More detail will also be provided in the application and application guides. The Texas General Land Office designed a competition scoring criteria that tries to allocate the very limited mitigation funds as equitably as possible.

Comment Received: Restricting an entity to the submittal of 2 applications per applicant is too limiting. The suggested rule that no applicant will be awarded for the second application until all successful eligible applicants have been awarded funding at least once is counter-intuitive to awarding the best projects and using resources in the most effective way to mitigate future risks.

Staff Response: The Texas General Land Office will be further defining the details of the scoring criteria in the final Action Plan. More detail will also be provided in the application and application guides. The Texas General Land Office designed a competition scoring criteria that tries to allocate the very limited mitigation funds as equitably as possible.

Comment Received: Limiting the same project from submittal in multiple competitions is incredibly limiting and prevents the leveraging of dollars to make the greatest mitigation impact. We would like to recommend that future population growth be considered in scoring criteria for all competitions to reflect the future need of a region, county, city, or other eligible entity.

Staff Response: The Texas General Land Office will be further defining the details of the scoring criteria in the final Action Plan. More detail will also be provided in the application and application guides. The Texas General Land Office designed a competition scoring criteria that tries to allocate the very limited mitigation funds as equitably as possible.

Comment Received: The NCTCOG would support a waiver requesting the permissibility of the enlargement of dams and levees beyond their original footprint.

Staff Response: The Texas General Land Office would be interested in a specific project that could be provided to HUD for such a waiver request.

Comment Received: Regarding the Resilient Communities Program, we recommend adding COGs as eligible entities and also recommend the GLO consult with the State Energy Conservation Office as building code requirements are decided upon for this program. A subgrant program would increase programmatic efficiency and encourage COGs to apply for funding on behalf of multiple entities. If subawards were considered, the $300,000 maximum project limit would need to be increased substantially.

Staff Response: The Texas General Land Office will consider all these items.

Comment Received: Regarding the Regional and State Planning and Resilient Communities Program, we request a clarification on whether the same limitations of two projects per entity, etc., apply to the Regional and State Planning and Resilient Communities Program Competition. We also commend the GLO for integrating the Regional and State Planning competition that focuses on regional-based planning studies.

Staff Response: The Resilient Communities Program does not have a limit on number of applications per entity.

Comment Received: Regarding CDBG-MIT Action Plan program administration, Appendix C: Program Expenditures: This indicates expenditures by program, but the Quarterly expenditures do not match the individual program description timelines throughout the document. Are these separate timelines? Does Table 6-2 indicate the funding by quarter that is available for awarding projects?

Staff Response: When a program is launched, there is a lag from program start to program/projects expenditures. For example, the GLO may release the application for a mitigation competition but there will not be any project expenditures until applications are awarded, under contract, and the subrecipient has begun its project. This process may take several months to a year.

Comment Received: NCTCOG supports the implementation of Advisory Committees and supports inclusion of urban and rural county and city representatives, river authorities,

water districts, flood control districts, council of governments, transit agencies, school districts, and other entities.

Staff Response: Thank you for the support and this recommendation.

Comment Received: Can the GLO please clarify whether an entity must own the property on which a proposed mitigation project is located or just have access to said property?

Staff Response: The entity does not have to own the property. Access for upkeep and maintenance is generally adequate for projects.

Comment Received: Section 4.4 – GLO Use of Funds: Please allow application from a single agency, or joint applications, to be submitted across multiple programs provided the proposed project meets the eligibility requirements for each.

Staff Response: The Texas General Land Office will consider this request; possible solutions may also include not holding the competitions simultaneously.

Comment Received: Section 4.4.1 2015 Floods State Mitigation Competition: Do not withhold multiple awards if project applications can show a minimum of 51 percent LMI benefit. In Section 4.4.1.3.i: Is the $10 million maximum amount per applicant or per project? In Section 4.4.1.1: Only 'Units of Local Government, Indian Tribes, and Councils of Governments' are eligible to submit applications. This limitation precludes many other agencies and the GLO should consider expanding. Section 4.4.1.9: Table 4-2: Please provide a definition for both the term 'Cost per Person Benefitted' and 'Percentage of Persons benefitting within Jurisdiction' criteria.

Staff Response: The Texas General Land Office will be adjusting how the second application for entities can be funded. Each application has a maximum amount of $10 million. Due to the limited amount of funds in the 2015 and 2016 Competitions, eligible applicants will remain as written. Other entities should seek eligible applicants to sponsor projects. Scoring criteria will be further defined in the final Action Plan, application guides, and applications.

Comment Received: Section 4.4.3 Hurricane Harvey State Mitigation Competition: Limiting the number of applications an agency can submit will greatly restrict flexibility in preparing mitigation projects and will make it more difficult to construct mitigation projects intended to protect the investments in housing programs and increase our resiliency to future storms. Limiting an agency to 3 applications and counting joint applications against each of the entities caps discourages joint applications. We request that agencies with more than 1 application not be held to one approval at a time, provided the agency is below their maximum allowable grant award for that program.

Staff Response: The Texas General Land Office will be updating how applications will be considered both in number of total applications allowed and how second awards will be funded in the final action plan.

Comment Received: Section 4.4.3.10; Table 4-4: Please provide a definition of ‘‘Cost per Person Benefitted’ and ‘Percentage of Persons benefitting within Jurisdiction’ criteria.

Staff Response: The scoring criteria will be further defined in the final action plan, application guide, and application.

Comment Received: Section 4.4.4 Regional Mitigation Program (COG MODs): We recommend a deadline be given to COGs as they develop their plans for fund distribution among their potential recipients.

Staff Response: Once the Action Plan is submitted to HUD for approval, the GLO will begin working with the COGs on the MODs. The COGs will be provided standardized instructions, forms, and due dates for completion.

Comment Received: Section 4.4.5 Hazard Mitigation Grant Program: Supplemental: While 25% non-federal cost match share is not required for the HMGP Supplemental Program, we suggest the GLO give additional considerations to potential recipients under this program that are willing to pay the customary 25% local match. We request the GLO provide some timeframe for selection of projects under HMGP Supplemental program.

Staff Response: The Texas General Land Office is working with the Texas Water Development Board and the Texas Division of Emergency Management to understand the match requirements and funding provided in the latest legislative session. The Hazard Mitigation Grant Program awards from CDBG-MIT will likely be one of the first programs announced.

Comment Received: Section 4.4.5.4: Was it the intent to make the maximum application amount equal to the total $170 million in total available funding proposed for this program in Section 4.4.5.4? One application could be for the full $170 million that way the Action Plan is currently written.

Staff Response: The Texas General Land Office is working with TDEM to prioritize projects to be funded from the supplemental funds being provided from CDBG-MIT.

Comment Received: Please allow potential HMGP Supplemental program recipients to submit back-up information regarding LMI and HID to GLO and TDEM to facilitate their evaluation of HMGP projects for funding under this program and consider removing the Section 4.4.5.10.iv requirement.

Staff Response: Thank you for this feedback.

Comment Received: When will the GLO release application/program guideline materials for the mitigation funding soon to become available? How much time will applicants be afforded to prepare applications?

Staff Response: The Texas General Land Office plans to release the application guides and applications for the competitions in the next few months and once the Action Plan is sent to HUD for approval. Applicants will likely be given 4-5 months to complete their applications.

Comment Received: The administration and project delivery percentages allowed by HUD are excessive.

Staff Response: The values allowed by HUD are maximums and can be reduced if they are not utilized.

Comment Received: I would like to see Long-Term Recovery Plans also considered as a source to validate projects.

Staff Response: This suggestion is going to considered and more detail will come out in the application guides.

Comment Received: It concerns me that Census Data alone is being used to determine the LMI standard.

Staff Response: HUD dictates how LMI is calculated in the federal regulations.

Comment Received: More clarification is needed regarding the definition of 'project impact area.'

Staff Response: Additional detail of the applications will begin the forthcoming application guides.

Comment Received: It is unclear why the construction standards presented on page 191 were chosen and it would be in the best interest to focus more on stronger building codes.

Staff Response: This suggestion is going to considered and more detail will come out in the application guides.

Comment Received: The Resilient Communities Program focuses specifically on zoning, land-use plans, and the adoption of building codes. This makes most counties ineligible for this funding and should be reconsidered.

Staff Response: This suggestion is going to considered and more detail will come out in the application guides.

Comment Received: The HMGP Supplemental program will excluded smaller jurisdictions because their projects cannot meet the $100 million threshold.

Staff Response: Applications do not have to be $100 million to be eligible for the HMGP Supplemental program.

Comment Received: Time is required to allow the conduction of studies and plans in order to accurately scope viable projects for submittal under the competitions presented in the Action Plan. Consideration should be given to this timeline of events.

Staff Response: The Texas General Land Office is trying to best balance the need to begin mitigation activities and determine the best use of funds simultaneously.

Comment Received: The regional allocation to CBCOG is inadequate to mitigate the risks associated with future storms.

Staff Response: The Texas General Land Office acknowledges that the funds provided by HUD are limited and has done the most possible to be equitable in the distribution of funds.

Comment Received: I do not understand why the current Action Plan seems to deter the city and county from having joint projects. I have seen flooding in the Cypress Creek and witnessed the horrors of Hurricane Harvey. We need detention, to preserve the prairie, and we need to stop building in the flood plain.

Staff Response: The Texas General Land Office is adjusting the number of applications eligible entities will be able to submit in the Hurricane Harvey State Mitigation Competition.

Comment Received: The Ingleside on the Bay community is highly susceptible to loss as result of tidal and flood damage. The LMI standards set forth by HUD should not be applicable to the assignment of coastal fund protection.

Staff Response: The Texas General Land Office must comply with the 50% LMI aggregate requirement set by HUD, absent a waiver.

Comment Received (multiple times): As a resident of Ingleside on the Bay since (2001, 2006, 2011, 2014, 2015, and 2017) I saw the devastation that Hurricane Harvey caused. I am frustrated that these funds seem to be biased toward being spent in urban areas due to the 50% LMI restriction. I would like to see a sliding scale developed for awarding the 20 points for the 50% LMI community projects. I would also like to see the SoVI modified to include measures that reflect the actual risk of catastrophic damage from floods and hurricanes to small cities like ours.

Staff Response: The Texas General Land Office must comply with the 50% LMI aggregate requirement set by HUD, absent a waiver. There are other criteria in the competitions that consider a community's ability to recover and likelihood of repetitive events.

Comment Received: Since these funds come from the U.S. Department of Housing and Urban Development (HUD), they are naturally biased toward being spent in urban areas—specifically blighted areas of extreme poverty, which does not apply to IOB. We agree with the Federal Register and p. 264 of the Plan, which indicates that many traditional HUD criteria have been waived when it comes to flood mitigation, so a new criterion for UNM was created. However, UNM has not been sufficiently prioritized in the scoring rubric for applications on pp. 221-222.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: GLO limits funding to projects related to mitigating against natural events, but one of our biggest flooding threats is from the increasing size and frequency of ships passing by us, due to our unique location at the convergence of two ship channels.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The Texas General Land Office is overlooking the importance of working-class coastal cities in alleviating poverty. The oil and gas industry that is exploding in Corpus Christi Bay brings with it the promise of many good-paying jobs that can provide a ladder out of poverty. Cities like IOB provide affordable housing and are located within easy commuting distance of these jobs. However, without adequate coastal protection, these areas can quickly become distressed. It is very challenging for a city the size of IOB, with limited resources, to be seen as an attractive partner in large grants. The Action Plan should include incentives for larger players to consider small coastal communities like ours in their plans.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: It would be relevant to include low population density as a risk factor, due to limited access to services, as well as specific disaster-related data that shows the level of suffering the Coastal Bend actually experienced after Hurricane Harvey. More relevant measures include housing destruction, temporary homelessness or relocation, permanent relocations elsewhere, increased need for temporary assistance like free/reduced school lunches or SNAP, etc. One of the biggest things we lost in the hurricane was the hospital; this makes us very socially vulnerable but is not captured in Census statistics.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Limits on housing solutions are too restrictive. The Resilient Communities Program reliance on approved building methods may stifle innovative approaches to resilience; for example, buoyant foundations (a form of amphibious architecture) do not meet current FEMA flood elevation guidelines but may be a good approach for IOB.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: For the scoring rubric on pp. 221-222, wherever it states LMI, change it to LMI and/or UNM and allow for partial points. Remove "poverty rate" as a tie-breaker; consider feasibility or innovativeness of project instead. For "Project Impact," consider miles of shoreline or size of acreage protected, not just number of people. The Texas General Land Office should consider awarding points based on unique flooding-related challenges, community age, affordability, and commuting distances, strength of partnerships, and the level of project innovation. The Texas General Land Office should also remove criteria that limit a local community's range of options for addressing its unique challenges and consider having a smaller funding category for trying out innovative approaches.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Consider increasing the amount of funding available to the Coastal Bend COG to facilitate development of more regional approaches to flood mitigation likely to enhance the Coastal Bend's resilience as a whole. The CBCOG has already been actively meeting with regional partners to approach this opportunity in a holistic manner.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Consider how to incentivize high dollar cross-jurisdictional projects, such as installing floodgates on the barrier islands. For example, floodgates in cuts on the barrier islands at Port Aransas, Mustang Island, and Port O'Connor could feasibly help protect much of the inland bays, and the communities and industries surrounding them, as well as the ship channels in the event of another hurricane by slowing down the energy from the storm waters.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: HUD CDBG-MIT funds are intended for mitigation activities (those activities that increase resilience to disasters and reduce or eliminate the long-term risk of loss of life, injury, damage to and loss of property, and suffering and hardship, be lessening the impact of future disasters). The Federal Register does not require the GLO to reserve certain funds for Harvey-affected areas and these funds should be used for mitigation activities for all coastal governmental entities and should not be restricted to those impacted by Hurricane Harvey. We request the allocation for the 2015 and 2016 Floods State Mitigation Competitions be increased. The Lower Rio Grande Valley Development Council and the Capital Area Council of Governments should be included in the Regional Mitigation Program. Drainage districts should be included as eligible entities for the 2015 and 2016 Floods State Mitigation Competition. The maximum amount of funding allowed under the 2015 and 2016 Floods State Mitigation Competition should be increased to $20 million.

Staff Response: The Texas General Land Office used the same methodology HUD used to determine the amount of funds by event year. No funds were included in the Regional Mitigation Program so communities that are not eligible for Hurricane Harvey are not a part of that program. Due to the limited amount of funds available in the 2015 and 2016 programs, the eligible applicants are limited to units of general local government and the COGs.

Comment Received: Ingleside on the Bay has urgent needs for the stability of its shoreline that will continue to flood without mitigation measures. We are hopeful that CDBG-MIT scoring criteria will take into consideration our unique challenges and provide us with access to much needed funding.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in a manner that is both consistent with all applicable federal law and works to ensure the needs of all communities are considered. The content of this comment will be given adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We applaud Commissioner Bush and look forward to helping communities recover while becoming more resilient to hazards. We would like to see the Action Plan speak towards socioeconomic urban flood risk; risk = hazard consequence; poverty is the largest determinant of vulnerability risk; and uninsured is the largest determinant of poverty.

Staff Response: The Texas General Land Office recognizes this comment and appreciates the positive feedback.

Comment Received: The cumulative damages of several recent disasters in Bastrop County in recent years warrant our county to be designated as 'most impacted and distressed' for the purposes of this allocation. We request further consideration by HUD and the GLO to include Bastrop County as a HUD MID county for Harvey Mitigation funding.

Staff Response: The Texas General Land Office is following HUD's MIT designations as required in the Federal Register notice.

Comment Received: We applaud the GLO for recognizing code's role in ensuring safety of building occupants. Five named hurricanes have hit the Texas coasts since 2000. Millions of coastal Texans are vulnerable to the most devastating impacts of these storm events due to inadequate and/or poorly enforced building and mechanical codes. Studies across other storm ravaged areas in the United States have shown a strong correlation between robust building codes and standards and the ability for housing units to better withstand the destruction. SPEER strongly supports and encourages the adoption of modern and resilient building and mechanical codes. The Texas General Land Office has the reach and oversight to help rectify these issues with the promotion of codes standards and training through the MIT Action Plan.

Staff Response: The Texas General Land Office recognizes this comment and appreciates the positive feedback.

Comment Received: We feel that for many public entities that receive or request funding from the CDBG-MIT, the ability to adequately implement programs and educational elements around the increased code standards could be challenging from a time, internal capacity, and financial standpoint.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: We request that all plan reviewers and inspectors on GLO Disaster Recovery and Mitigation projects be certified by the International Code Council for the specific codes they are tasked with enforcing. This includes all personnel performing plan reviews and inspections be responsible to GLO or another entity directly responsible to GLO, and not subcontractors to the builders or contractors performing the work. Third party, non-public entity training resources are utilized to facilitate the highest possible level of compliance with the relevant codes and to help affected jurisdictions maneuver through the changes.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: We encourage the GLO to include a requirement that all LHMAPs include an analysis of the potential reduction in the risk of loss of life, injury, damage to and loss of property, suffering and hardship that may be realized by adoption and compliance with new national model building codes as they are published.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received (multiple times): Harris County was substantially impacted by major flooding that has resulted in loss of life and extensive property damage. The recovery effort from these disasters is still an ongoing process and mitigating future floods is top priority. I believe that the final version of the CDBG-MIT Action Plan can be made much more effective to alleviate flooding in the highest flood-prone and populous areas of the state if it contains the technical changes requested by county stakeholders.

Staff Response: The Texas General Land Office appreciates the feedback contained within this comment and remains committed to administering CDBG-MIT funds in the most efficient and effective manner possible.

Comment Received: The Harris County Commissioners Court passed a resolution urging The Texas General Land Office to make revisions to the draft State of Texas CDBG-MIT Action Plan that take into consideration the requested changes and concerns that Harris County provides in written and public comment.

Staff Response: The Texas General Land Office recognizes the action taken by the Harris County Commissioners Court and remains committed to ensuring all CDBG-MIT funds are administered in the most efficient and effective manner possible.

Comment Received: Harvey Home Connect, a Houston area nonprofit, encourages the GLO to ensure Harris County gets its fair share of mitigation funding. Although Harris County sustained 44% of the damage from Hurricane Harvey, it will only receive 8% of funds. I would also ask that the public comment period be extended by two weeks.

Staff Response: The Texas General Land Office remains committed to administer CDBG-MIT funds in compliance with all applicable law. As such, the GLO has conducted the required 45-day public comment period required by HUD and, after multiple requests from stakeholders, extended that public comment period seven more days to allow for additional feedback.

Comment Received: Limiting the total number of applications by applicant in each competition leaves vital projects off the table by forcing applicants to choose some projects at the expense of others.

Staff Response: The allocation of the CDBG MIT funds is based on future risk not previous damage per the HUD Federal Register notice.

Comment Received: Counting joint applications towards each applicant's total submission in each competition forces applicants to choose some projects at the expense of others and

dis-incentivizes coordination and cooperation as joint applications limit applicant's total potential award amount and impact its constituents.

Staff Response: The application eligibility will be updated in the Hurricane Harvey Ste Mitigation Competition the reflect consideration to comments such as this one.

Comment Received: By capping the award amounts by competition, the GLO is artificially and arbitrarily limiting the impact of available funds.

Staff Response: The Texas General Land Office, in response to the public comment process, is considering altering the caps currently listed on award amounts for one or all of the competitions under the CDBG-MIT Action Plan. For final caps on award amounts, see the Action Plan.

Comment Received: Requiring all eligible applicants to receive funding at least once before considering an applicant's second application creates an artificial and disproportionate burden on applicants most affected by disasters.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The amount of funding available to Harris County and Houston is not proportionate to the damage sustained and should be revised.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: There is a lack of examples of cultural and historic properties eligible for funds.

Staff Response: The Texas General Land Office appreciates the other feedback provided by the comments above and will give each point adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The current Action Plan discourages multi-jurisdictional coordination and cooperation by having joint applicants "count against" the number of projects that can be awarded to each jurisdiction.

Staff Response: The Texas General Land Office appreciates the feedback provided by the comments above and will give each point adequate consideration as CDBG-MIT programs and policies progress, the application eligibility will be updated in the Hurricane Harvey State Mitigation Competition the reflect consideration to comments such as this one and additional detail on the scoring criteria will be added to the Action Plan and the applicable application guides for the MIT programs.

Comment Received: The limit of three (3) $100 million projects discourages relationships for large regional projects. We recommend that the dollar amount be increased to ensure that joint projects are not at a disadvantage.

Staff Response: The Texas General Land Office appreciates the feedback provided by the comments above and will give each point adequate consideration as CDBG-MIT programs and policies progress, the application eligibility will be updated in the Hurricane Harvey State Competition the reflect consideration to comments such as this one and additional detail on the scoring criteria will be added to the Action Plan and the applicable application guides for the MIT programs.

Comment Received: The draft Action Plan should add riverine erosion (erosion caused by excessive river flows) as a natural hazard and control of that river erosion should be considered a flood control measure.

Staff Response: The Texas General Land Office appreciates the feedback provided by the comments above and will give each point adequate consideration as CDBG-MIT programs and policies progress; the application eligibility will be updated in the Hurricane Harvey State Mitigation Competition to reflect consideration of comments such as this one, and additional detail on the scoring criteria will be added to the Action Plan and the applicable application guides for the MIT programs.

Comment Received: We recommend that the Action Plan list all scoring criteria and benefit/cost calculation methods in an appendix for clarity.

Staff Response: The Texas General Land Office appreciates the feedback provided by the comments above and will give each point adequate consideration as CDBG-MIT programs and policies progress; the application eligibility will be updated in the Hurricane Harvey State Mitigation Competition to reflect consideration of comments such as this one, and additional detail on the scoring criteria will be added to the Action Plan and the applicable application guides for the MIT programs.

Comment Received: We recommend that the LMI calculation be based on the total number of people affected by the project, not just those who are immediately adjacent to the project area.

Staff Response: The Texas General Land Office appreciates the feedback provided by the comments above and will give each point adequate consideration as CDBG-MIT programs and policies progress; the application eligibility will be updated in the Hurricane Harvey State Mitigation Competition to reflect consideration of comments such as this one, and additional detail on the scoring criteria will be added to the Action Plan and the applicable application guides for the MIT programs.

Comment Received (multiple times): We represent a coalition of community advocates and professionals who seek to protect the critical cultural, arts, and historic assets of our homes. We would like to encourage the following changes: The Texas General Land Office should explicitly include language that ensures cultural historic assets are included as a part of infrastructure in the Action Plan; the GLO should include cultural districts as "Serve Districts" so they are eligible to apply for the Hurricane Harvey State Mitigation Competition.

Staff Response: The Texas General Land Office appreciates the content of this comment and will give it adequate consideration as CDBG-MIT policies and programs progress.

Comment Received: Harvey Home Connect is a Houston area nonprofit that works to coordinate disaster assistance for people affected by Hurricane Harvey. The Action Plan indicates that although Harris County sustained 44% of the damage from Harvey, it is only eligible to receive 8% of the CDBG-MIT funds. This is insufficient and I urge you to allocate more to projects in Houston and Harris County.

Staff Response: The Texas General Land Office appreciates the feedback contained in this comment and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received (multiple times): We ask the GLO to consider making the following changes to better facilitate flood projects for the Hurricane Harvey Competition Funds (Section 4.4.3).

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received (multiple times): Selection of applications should be based on need and management capacity. Eliminate the $100M limit.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received (multiple times): Treat joint applications from regional entities as applications from new entities.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received (multiple times): Omit maintenance partners as co-applicants and allow them to be listed as participants.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received (multiple times): Set a time to disburse secondary and tertiary rounds of competition funding.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received (multiple times): Allow applications for Hurricane Harvey Competition Funds to automatically be considered for other State Action Plan categories.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received (multiple times): Work with the Texas Water Development Board to leverage Senate Bill 7 applications.

Staff Response: The Texas General Land Office remains committed to working with other agencies, both state and federal, to ensure CDBG-MIT funds are administered in the most effective and efficient manner possible.

Comment Received: Although Harris County sustained 44% of the damage from Hurricane Harvey, it is only eligible to receive 8% of funds.

Staff Response: The allocation of the CDBG MIT funds is based on future risk not previous damage per the HUD Federal Register notice. The application eligibility will be updated in the Hurricane Harvey State Mitigation Competition the reflect consideration to comments such as this one.

Comment Received: This amount is not sufficient to meet our needs and I urge you to allocate more to projects in Harris County.

Staff Response: The Texas General Land Office appreciates the other feedback provided by the comments above and will give each point adequate consideration as CDBG-MIT programs and policies progress. The Texas General Land Office remains committed to ensuring CDBG-MIT funds are administered in compliance with all applicable laws, including funding award percentages.

Comment Received: The public comment period should be extended by 2 weeks.

Staff Response: In keeping with adherence to federal law, the GLO has conducted the mandated 45-day public comment period and extended the comment period to ensure the public participation process is robust as possible.

Comment Received: I believe Harris County deserves more than 8% of the mitigation funding.

Staff Response: The allocation of the CDBG MIT funds is based on future risk not previous damage per the HUD Federal Register. The application eligibility will be updated in the Hurricane Harvey State Mitigation Competition the reflect consideration to comments such as this one. The Texas General Land Office appreciates this comment and will give it consideration as CDBG-MIT policies and programs progress.

Comment Received: We agree with the using building codes and land use restrictions as a means for preventing future damage from storms.

Staff Response: The Texas General Land Office appreciates the positive feedback provided in this comment and will give it adequate consideration as CDBG-MIT policies and programs progress.

Comment Received: We recommend the creation of a flood management zone along creeks and rivers to maximize health, safety, and economic benefits of mitigation planning.

Staff Response: The Texas General Land Office appreciates the positive feedback provided in this comment and will give it adequate consideration as CDBG-MIT policies and programs progress.

Comment Received: The Texas General Land Office should aid in the development of a state floodplain management criteria for new developments and the land planning process. We suggest reviewing and considering the *"Guidance for Sustainable Drainage on the Texas Coast"* manual that is currently pending approval from the EPA and the NOAA.

Staff Response: The Texas General Land Office appreciates the positive feedback provided in this comment and will give it adequate consideration as CDBG-MIT policies and programs progress.

Comment Received: We believe that the support of local community efforts regarding the above measures should be further explained.

Staff Response: The Texas General Land Office appreciates the positive feedback provided in this comment and will give it adequate consideration as CDBG-MIT policies and programs progress.

Comment Received: We request that consideration be given to the allocation of additional funding to heavily impacted jurisdictions to fund projects adopted in LTR and HMGP Plans that have already received extensive public input.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: State Mitigation Competition Program. It is unlikely that communities will receive more than one or two projects given the program criteria as funds will run out before a second or third project can even be considered.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: HMGP Supplemental. The most effective approach and use of funds would be to fund the HMGP MIT Supplemental funding at a much higher level and pull these 'already processed' applications off the shelf and fund them. The initial project threshold needs to be clarified to avoid precluding small and medium cities and counties from participating.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: LMI Project Impact Area. We suggest the scope of the project impact area be expanded to include all communities that may benefit.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Alternative Measure – National Objectives Language. Instead of using LMI as a measure, we suggest the GLO should rely on Urgent Need Mitigation, in tandem with considering some other factors to specifically target higher at-risk populations. Other measures factors may include SNAP/D-SNAP, homelessness, or displaced students. In our opinion, this is a better indication of LMI in an area.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: We request clarification on the following: Whether the LMI goal may be reached in multiple project areas by a service being provided for similar (potentially adjacent) communities that together meet the LMI goal.

Staff Response: The LMI requirement is met by a service area that is at least 51% LMI in its composition.

Comment Received: It is unclear how a program will identify a project impact area.

Staff Response: Project impact area is defined by the applicant as the area/beneficiaries served by a project.

Comment Received: It is unclear whether projects named in the GLO Coastal Resiliency Master Plan would directly benefit 50% LMI in the project area. Because Tier I projects have already been identified as critical to reduce risk, they should NOT be assessed by the LMI criterion or be part of the 50% total equation.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: We request funds expended in the last 12 months count towards any matching fund requirement.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: We ask for clarification of whether or not studies and/or development of a drainage utility will be eligible for funding.

Staff Response: The Texas General Land Office will provide additional detail on application requirements in the program application guides.

Comment Received: Please consider adding the city of Bastrop and Smithville to the state most impacted and distressed (State MID) due to significant flood damages that occurred in these areas compared to other cities in the county.

Staff Response: The Texas General Land Office is following HUD MID designations as required in their Federal Register notice.

Comment Received: Please consider allowing CDBG Mitigation funds to be utilized for mitigation projects in areas with threatened and endangered species.

Staff Response: The Texas General Land Office recognizes and appreciates the content of the above-listed comments and offers the following responses:

Comment Received: The Department of Energy (DOE) would like to offer technical assistance to aid in the development of projects under the CDBG-MIT funding to address the threats described in the Action Plan that face the Energy Lifeline.

Staff Response: The Texas General Land Office remains dedicated to coordinating with local, state, and federal entities to ensure the most effective and efficient administration of CDBG-MIT funds. Should the necessity arise, the GLO remains open to utilizing the technical assistance of the Department of Energy in addressing threats to the Energy Lifeline.

Comment Received: The federal register allows grantees to request a waiver for the use of CDBG-MIT funds to assist privately owned utilities. The DOE can assist the GLO with this waiver process to ensure any private utility project provides a public benefit.

Staff Response: The Texas General Land Office remains dedicated to coordinating with local, state, and federal entities to ensure the most effective and efficient administration of CDBG-MIT funds. Should the necessity arise, the GLO remains open to utilizing the assistance of the Department of Energy in advocating for potential waivers from HUD.

Comment Received: The DOE would welcome to opportunity to work with Texas and other stakeholders to reduce vulnerabilities and strengthen the resilience of the state's energy infrastructure in the face of all hazards.

Staff Response: The Texas General Land Office remains open to coordinating efforts with other state and/or federal agencies if that coordination is within the best interests of administering CDBG-MIT funds in the most effective and efficient manner possible. The feedback provided in this comment will be given adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We ask for a full explanation of the legal authority by which money officially designated for Harvey relief for Harris County and the city of Houston can be diverted from the city and the county. Bayou City believes that diverting funds from the city and county violates the Executive Order on Environmental Justice.

Staff Response: The Texas General Land Office is updating the Hurricane Harvey State Mitigation Competition in response to comments such as this one and others.

Comment Received: We urge that the full amount originally designated to Harris County and the city of Houston be reinstated.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: We encourage the reconsideration of the language used in the *Hurricane Harvey State Mitigation Competition* section to reflect the following: Removal of the limitation on the number of applications to encourage regionalization of projects. Revisions to the timing of awards on multiple applications from a single entity to avoid delaying the completion of projects.

Staff Response: The Texas General Land Office is updating the Hurricane Harvey State Mitigation Competition in response to comments such as this one and others,

Comment Received: As a resident of Kingwood, TX, I am writing to petition that any additional grant funding received for Hurricane Harvey recovery purposes remove the SBA 'duplication of benefits' criteria.

Staff Response: HUD has indicated in the Federal Register notice for the CDBG-MIT funds regulations that SBA reimbursements will be ineligible.

Comment Received: Please include arts, culture, and history. It is much needed.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: My request is to allow drainage districts and municipal authorities more flexibility to calculate NED Benefit Ratios for projects that seek to provide relief with projects in Harris and Galveston Counties.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration. The Texas General Land Office is updating the Hurricane Harvey State Mitigation Competition in response to comments such as this one and others,

Comment Received: My home flooded during Hurricane Harvey and I did not have insurance because my home was not located in a flood zone. I am currently being denied assistance in a Houston program because I utilized an SBA loan and the duplication of benefits rule prevents further assistance. This comment is to petition that any potential additional grant funds remove the SBA duplication of benefits criteria for funding awards.

Staff Response: HUD has indicted in their Federal Register notice for the CDBG-MIT funds regulations that SBA reimbursements will be ineligible.

Comment Received: My home flooded during Hurricane Harvey and I did not have insurance because my home was not located in a flood zone. I am currently being denied assistance in a Houston program because I utilized an SBA loan and the duplication of benefits rule prevents further assistance. This comment is to petition that any potential additional grant funds remove the SBA duplication of benefits criteria for funding awards.

Staff Response: The content of this comment is outside of the scope of the CDBG-MIT Action Plan.

Comment Received: My positive feedback includes: The plan is not solely focused on rebuilding and invests in mitigation and the plan invests in flood-proofing housing when

rebuilding is involved. My negative Feedback includes: The city of Houston is being neglected because funds are not being allocated proportionate to storm damage and need, the Action Plan discourages collaboration, equity is included, but it is unclear as to how equitable solutions will be incorporated and how equity is defined and the plan makes no mention of climate change or building to protect against new NOAA rainfall amounts.

Staff Response: The Texas General Land Office recognizes this comment and will give all aspects, both positive and negative, adequate consideration as CDBG-MIT policies and programs progress.

Comment Received: The city of Houston respectfully requests a CDBG-MIT allocation that is proportionate to the past damages and ongoing risk within the Houston-Harris County region. The city of Houston requests a direct allocation method, based on damages, to be utilized for CDBG-MIT funds.

Staff Response: The Texas General Land Office is not making any direct allocation from the CDBG-MIT funds but the city of Houston is eligible to participate in the 2016 and Hurricane Harvey State Mitigation Competition Programs.

Comment Received: All programs should be revised to ensure that the distribution is proportional to the impact of Hurricane Harvey and previous storms for areas that are highest at risk.

Staff Response: All funding distributions and scoring criteria for CDBG-MIT programs will be listed in the Action Plan.

Comment Received: Joint application requirement language should be revised to incentivize regional coordination by removing the limit on the number of joint applications that may be submitted by an entity.

Staff Response: The Texas General Land Office, in response to the public comment process, is considering altering the cap on the number of applications permitted per applicant. For final application caps amounts, see the Action Plan.

Comment Received: No limit on project applications should be set, rather a total amount to be received should be proportional to statutory citation and documented risk.

Staff Response: The Texas General Land Office, in response to the public comment process, is considering altering the cap on the number of applications permitted per applicant. For final application caps amounts, see the Action Plan.

Comment Received: The cap on grant awards should be eliminated and funding awards should be given to areas with the highest documented risk and highest quantified benefits.

Staff Response: The Texas General Land Office, in response to the public comment process, is considering altering the cap on grant minimums, the number of applications permitted per applicant, and the cap on grant funding awards. For final amounts for each of the above-listed, see the Action Plan.

Comment Received: The Risk Assessment needs to consider the frequency of events and implications of Atlas 14 data as noted by the Texas Water Development Board.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: The Risk Assessment also needs to consider economic impacts at the local, state, and federal levels.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Project evaluation should consider future conditions, not just historic floods, to properly mitigate for the highest risk that the region faces.

Staff Response: All eligible applications will be scored according to the criterion for the correlating CDBG-MIT program. For more information on scoring criterion, see the Action Plan.

Comment Received: Applications should be reviewed and approved for the highest risk areas based on ranked quantified benefits.

Staff Response: All eligible applications will be scored according to the criterion for the correlating CDBG-MIT program. For more information on scoring criterion, see the Action Plan.

Comment Received: Covered Projects should be included in the Plan and not incorporated via amendment later.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: The definition of 'project' should be expanded upon to include components with independent utility which, when combined, provide greater cumulative benefits.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Project phasing should also be considered and encouraged as larger projects require a downstream/upstream component.

Staff Response: The Texas General Land Office recognizes this comment and will give project phasing adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: The following should be incorporated into the scoring criteria and point system: (1) Criterion that ranks applications based on impact of repetitive disasters; (2) criterion that awards additional points to projects that tie-back to the associated flood event for each competition; and (3) increase the maximum points allotted for the 'Project Impact' criterion. "Project Impact" criterion should be revised to account for a more comprehensive assessment of the impacts of individual projects. This includes: (1) add a sub-criterion that ranks and awards points to applications based on the economic impacts of the proposed project; (2) remove 'Costs per persons benefitting' sub-criterion; (3) revise 'Percentage of persons benefitting within jurisdiction' to number of persons benefitting; and (4) add a sub-criterion that ranks and awards points to applications that demonstrate a reduction in the number of flooded structures. "Project Identified in Local Adopted Plan" criterion should be removed. "per capita market value" criterion should be removed.

Staff Response: The Texas General Land Office recognizes the points presented within this comment and will give each point it contains adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: The maximum amount of point allotted under 'Mitigation/Resiliency Measures' criterion should be increased and included in all competitions.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: The 'Management Capacity' criteria and its sub-criteria need to be properly and fully defined.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Additional information related to the HMGP applications for TDEM to consider should be allowed.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: A deadline for the COGs to develop plans for funding distribution amongst potential recipients should be set.

Staff Response: The Texas General Land Office recognizes this comment and will give adequate consideration to developing a deadline for COGs to develop their MODs as CDBG-MIT programs and policies develop.

Comment Received: The timing for implementation, completion and adoption of plans and studies related to Resilient Communities Program should be modified to 24 months minimum.

Staff Response: The Texas General Land Office recognizes this comment and will give adequate consideration to the altering the Resilient Communities Program timeline as CDBG-MIT programs and policies develop.

Comment Received: The planning allocation should mirror previous allocations and at least $150 million of planning funds for additional projects should be added to the Hurricane Harvey State Mitigation Competition.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Eligibility should be expanded beyond the projects listed in the Texas Coastal Resiliency Master Plan and consideration should be given to other projects that could greatly improve coastal resiliency.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Funding for mitigation activities that are in line with the intent of HUD CDBG-MIT program should be allocated to the city of Houston.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: A line of credit should be provided for program implementation.

Staff Response: Certain pre-award costs, if deemed eligible under the law, may be reimbursed upon a subrecipient receiving a reward. For more information regarding these types of costs, see the Action Plan and applicable federal law.

Comment Received: The timeline for 2016 Floods State Mitigation Competition should be extended to 10 years.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop. It should be noted that

CDBG-MIT programs are limited to obligation and expended timelines established in the correlating Federal Register notice.

Comment Received: Explicit language should be included that encourages the inclusion of cultural and historic assets as critical infrastructure in project criteria as well as planning efforts.

Staff Response: The Texas General Land Office appreciates this comment. Any projects funded by the CDBG-MIT funds must meet all local, state, and federal laws, so any communities with such requirements could likely show these expenses to be eligible. The Texas General Land Office generally does not add any additional requirements not already imposed by the funding source.

Comment Received: The Texas General Land Office should adopt a CDBG-MIT award system that is based on risk.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funding in a manner that provides the most effective and efficient mitigation programs possible. All programs will select projects in accordance with the established criteria.

Comment Received: The city of Houston and Harris County submit the regional stormwater infrastructure investments for consideration; and we request the GLO provide a line of credit or advance funding for project delivery.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funding in a manner that provides the most effective and efficient mitigation programs possible. All programs will select projects in accordance with the established criteria. As permitted under the law, certain preliminary costs may be deemed eligible for reimbursement upon the approval of a program application under a CDBG-MIT application.

Comment Received: We support the GLO's commitment to planning activities and agree that the GLO should work with a broad spectrum of stakeholders including Texas universities, state agencies, federal agencies, regional planning and oversight groups and/or vendors to conduct these studies.

Staff Response: The Texas General Land Office appreciates the positive feedback provided in this comment and remains committed to coordinating with other state and federal agencies to ensure the most effective and efficient administration of CDBG-MIT funds possible.

Comment Received: In defense of those who were put on the 'waitlist', what about those who lost vehicles, can't drive, or are disabled? The way programs have been run is unfair. What is happening to the 979 people in Jefferson County who are on this waitlist? Something needs to change before that "We the People" mantra becomes "Get it how YOU live."

Staff Response: The Texas General Land Office recognizes and appreciates the content of this comment and will give it adequate consideration as CDBG-MIT programs and policies progress. Applicants currently on the waitlist for the Homeowner Assistance Program in Jefferson County will continue to be served from the addition of the CDBG-MIT funds to the program for the SETRPC region.

Comment Received: We applaud the State's focus on supporting local and regional competitions as a strategy for identifying mitigation projects, use of the Coastal Resiliency Master Plan, and actions to enhance the resilience of housing for LMI residents. The Texas General Land Office efforts listed above would be enhanced by including a more robust consideration of climate risks in the plan and a greater focus on ensuring that mitigation projects prioritize ecosystem restoration. We also present the following four ways to improve the Action Plan.

Staff Response: The Texas General Land Office recognizes the comments provided above and will give each point adequate consideration as CDBG-MIT programs and policies progress. More detail on programs will be forthcoming in program applications.

Comment Received: Include more robust consideration of future threats to Texas communities and ecosystems from climate change and sea level rise. Require that jurisdictions implement best practices when managing a floodplain buyout program. More fully integrate and prioritize ecosystem restoration and natural infrastructure projects. Leverage partnerships with Audubon and other environmental organizations.

Staff Response: The Texas General Land Office recognizes the comments provided above and will give each point adequate consideration as CDBG-MIT programs and policies progress. More detail on programs will be forthcoming in program applications.

Comment Received: Interstate 10 has been elevated with NO drainage underneath and this has led to flooding in areas that never flooded before. This needs to be addressed ASAP.

Staff Response: The Texas General Land Office would suggest that the commenter provide this input to local elected officials who will be prioritizing and selecting projects for GLO consideration.

Comment Received: The formulation for creating the LMI data needs to be revamped on all HUD funded programs. The formulation should be derived from each county's statistical data to give each county an accurate LMI for its geographical boundaries.

Staff Response: The Texas General Land Office remains committed to ensuring CDBG-MIT funds are administered in a manner that is consistent with all current federal law, including the currently accepted means for calculating LMI data. The Texas General Land Office does, however,

remain open to consistently revamping analysis tools to ensure the most comprehensive program administration possible and will give the content of this comment adequate consideration.

Comment Received: Low- to moderate-income calculations should include more than just the immediate area, it should include the total affected area; project eligibility and scoring criteria should be easy to comprehend and follow; and it is important that the provision that permits the combination of multiple smaller projects to meet the minimum award threshold remain in place or be clarified to solidify this option for smaller communities.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration to each point presented in this comment as CDBG-MIT programs and policies progress. Additional details on program competitions will be provided in forthcoming application guides.

Comment Received: The city feels the GLO should work closely with the Texas Water Development Board SB7 mitigation planning; any new data developed should support development of a statewide flood plan; and the GLO should allow mitigation funds to be available to communities for floodplain management training.

Staff Response: The Texas General Land Office appreciates this feedback and is currently working with TWDB and TDEM to ensure funding sources are leveraged and streamlined to the best of our ability. It should be noted that the GLO remains committed to coordinating with any and all relevant state and local agencies to ensure the effective administration of CDBG-MIT funds. This coordination includes the provision of technical assistance, as needed, to aid communities at all stages of the process.

Comment Received: We believe that the single most impactful action that the state of Texas could take to improve resiliency and promote disaster mitigation on a statewide basis would be to promote a strong, uniform, and well-enforced set of construction standards.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration to each point presented in this comment as CDBG-MIT programs, particularly those that emphasize promoting more resilient building codes and standards, progress.

Comment Received: The state should not count joint applications towards each applicant's total submissions in each competition; capping the award amounts for each competition artificially limits funding for much-needed transformative projects aimed at taking the most people out of harm's way; delays will be caused by the requirement that all eligible applicants receive funding once before considering second applications.

Staff Response: The Texas General Land Office appreciates this feedback and will be updating the Hurricane Harvey State Mitigation Competition in response to this and others that have been similar.

Comment Received: The city of Robstown presents the following comments to the CDBG-MIT Action Plan: Additional funds are needed for the HMGP Supplemental Program; projects that do not meet the HMGP Supplement Program minimum threshold should still be considered for funding.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We recommend stronger building standards rather than the green building codes; the Resilient Communities Program should be expanded to also include activities for which counties have authority/responsibility or, at a minimum, should require some coordination with the county to assess plans and data regionally.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: There is a current need for a first responder facility in the city of Robstown and clarification is requested on whether or not this would be an eligible project.

Staff Response: Additional detail is needed to determine eligibility. Assuming eligibility, the city could sponsor this project in the programs they are eligible for.

Whether the LMI goal may be reached with multiple project areas; the definition of 'Program Impact Area' and the definition of 'Covered Projects.'

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration to each point presented in this comment as CDBG-MIT programs and policies progress. Additional detail will be forthcoming in the program application guides that will be provided for all CDBG-MIT programs in the coming months.

Comment Received: The Action Plan provides an excellent summary of much of the high-level work and information that has been undertaken and gathered.

Staff Response: The Texas General Land Office appreciates the positive feedback provided in this comment and will each point adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: I support that the Action Plan (1) addresses the issues of coordination and cooperation of many state and federal agencies involved in flood management, (2)

changes the focus from mitigation of damages experienced from previous disasters to mitigation of risk hazards from future disasters, (3) promotes regional planning solutions for mitigation, (4) includes consideration of costs reasonableness in some cases and benefit-cost analysis on others, and (5) promotes natural infrastructure as an option for mitigation.

Staff Response: The Texas General Land Office appreciates the positive feedback provided in this comment and will each point adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: I have the following questions regarding the Action Plan. Is there an appointed agency to lead coordination and cooperation efforts? Is there any intention of considering the impacts of an ever -warming earth in the mitigation approaches? How will regional planning solutions be prioritized? Is there a reason why an economic prioritization factor is not being used? Is there a preference for natural or manmade infrastructure?

Staff Response: At this time, no lead agency has been appointed to coordinate cooperation efforts; despite this, the GLO remains committed, as the lead agency charged with administering CDBG-MIT funds, to actively filling this role as necessary. The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress. All program applications will be prioritized as presented under the correlating scoring criteria. All projects will be considered against the correlating program criteria with awards made accordingly.

Comment Received: Page 184, bottom paragraph, first sentence, should be changed to read: "The TCWP has worked to develop the Community Health and Resource Management (CHARM) GIS mapping application."

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: As the program leader for this effort, I can say that it is likely that the technology stack will change over time, and thus the proposed text revision will strike the reference to specific propriety systems and products.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Page 192, section 3.8: Is the intent of this section that 2-foot freeboard should be measured above the 1% flood elevation, and if so, should it read "At least 2 feet above the 1% flood elevation"? The same issue is also present in the last sentence of the same paragraph.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Page 203, item 4.4.1.5, ix: This sentence construction could be open to several interpretations, for example, direct cash transfers to third-party HMGP efforts, which I don't believe is the intent with this item. Additionally, and to the outcome that I believe the agency intends, is that funds expended towards eligible activities can additionally count towards cost share for local HMGP efforts. If so, the item is a better fit as a general program guideline.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Sections 4.4.1.4 and 4.4.1.5: Several of the listed items are sometimes performed by drainage districts, school districts, and other entities not listed as a unit of local government (cities and counties). Are unlisted performing entities expected to be a sub-award or sub-contract within the eligible applicant's proposal, or are they precluded from receiving program funds? Please clarify in guidance.

Staff Response: Special purpose districts are not eligible applicants for the 2015 Floods State Mitigation Competition due to the limited funds available. These types of entities would need to be sponsored by an eligible applicant as noted in 4.4.1.4.

Comment Received: Page 205, section 4.4.1.7, ii (and where item is repeated in other program areas): Item is ambiguous about kinds of risks for eligible activities, considering that the plan has dedicated section 2 to describing risks. Possible solution to clarify ambiguity is to reference a table of hazards provided as general guidance, section 3. Also, is it the agency's intent to limit program activities to the three listed hazards as currently drafted in this specific section, or to all hazards listed in plan section 2? As currently written, blizzards, drought and hail do not appear to be eligible hazards.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Page 207, Table 402: Is it the intent of the agency that an out of compliance contract negates any eligible points from other criteria in this section? If so, that is different than "zero" points as marked in the table. Also, does this refer to contracts only funded through this opportunity? Any CDBG opportunity from prior disasters, i.e., Ike? Or, any contract funded through any program within the agency, i.e., CMP? It would be helpful to clarify the agency's intent.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Page 219, item 4.4.3.7 iii: "Funds may not be used to assist a privately owned utility…" The word "Assist" is potentially expansive, and GLO's intent should be clarified further. Would a city be able to contract with a private utility on local infrastructure improvements, i.e, the co-location of municipally and privately owned utilities? Does assist mean to include sub-contracting or procurement for services from private utilities to perform project work for the city?

Staff Response: The limitation on funding privately owned utilities is directly from HUD. Any improvement that benefits such an entity is not an eligible use regardless of who the applicant is.

Comment Received: Page 220, 4.4.3.7: The second clause may not be necessary, as the TX constitution states as much. Seems like the possible intent here, as I read this, is that eminent domain acquisitions via this program shall be limited "solely" to public uses and not benefit to any particular private party. Also, anticipate that a community may wish to supplement an ED acquisition with third-party funds (say, another federal or state program), perhaps in a phased ED approach. Will the agency require the eligible entity, if it is proposing such an approach, to clearly distinguish CDBG-MIT program funding apart from supplemental, third-party funding for purposes of enforcing the public use criteria?

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Page 232, item 4.4.5.2, Covered Projects: Is not this definition provided by federal statute? Why not include the statute and citation?

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Page 235, item 4.4.5.8, iii: Clarification needed here. "Meets the definition of mitigation activities" … per what?

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Page 235, 4.4.5.8, vii: ". . . plan for long-term. . ." The word "Plan" is used several different ways in the overall document. Does agency intend to state, "Include costs for long-term O&M"?

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Page 258, item 4.4.10.7, ii: Flood Damage Prevention Ordinance: Criteria a: flood elevation at what risk level? 1%? 0.2% Agency should clarify intent and criteria here.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Page 258 and elsewhere regarding timeframes for adoption of local plans and ordinances: The adoption of the plan (perhaps via general guidance in the CDBG-MIT plan) should include a process for a waiver for limited extensions (3 months, 6 months) based on (1) an 'as of right' extension such that project progress has been made in good faith (i.e., a missed quorum of governing body), and (2) extenuating circumstances (i.e., another disaster).

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Page 258-259. Items iii, iv, and v: Should include lengthier performance periods for project completion and adoption. Local procurement procedures, the creating of local advisory or steering committees, time to revise through public comment, and final adoption usually require approval by a governing body, and which require certain regulatory clocks for public notice, sometimes up to 45 days. 18-month period of performance would be realistic for item iii and 24 months for item iv; If item v comprehensive planning effort also includes zoning and CIP plan, expect the process to go beyond 24 months, although three years is probably excessive. In any case, a process for granting waivers might be a good safety valve for administering this program. Likewise, performance period guidelines for a sequences approach might be advisable here. Require that applications factor in the calendar time for the approvals of its governing body.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Page 258-259: Communities can prepare CIP plans and Housing studies apart from comp plans and zoning, and thus these activities should be included as standalone eligible activities. This will provide flexibility and account for a range of local regulatory and planning frameworks. The agency should consider language and performance periods for allowing communities to sequence a menu of activities, for example, a housing study, comprehensive plan, and then zoning.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Page 259, 4.4.10.7: eligibility and selection criteria: Communities should demonstrate local capacity for or commitment to develop code enforcement capacity.

Staff Response: The Texas General Land Office recognizes this comment and appreciates the feedback regarding communities and their ability to demonstrate local capacity for code enforcement.

Comment Received: Page 259, 4.4.10.7: eligibility and selection criteria: Guidance should provide language that costs for proposals will be reviewed by the agency. The maximum award of $300,000 is far more than is needed for a flood protection ordinance. Likewise, the cost for a comprehensive plan for a 10,000 person municipality will differ from a plan for a 120,000 person community.

Staff Response: The Texas General Land Office, in response to the public comment process, is considering altering project minimums as addressed in this comment. For final minimum award amounts, see the Action Plan.

Comment Received: Program guidance should include language that award costs will be reviewed to be consistent and reasonable with market costs by the itemized activities. Furthermore, the agency may wish to break out maximums and minimums by population size to expedite the review and provide benchmarks for applicant communities.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: If the agency elects to base costs on population size, request that community submit objective criteria (i.e., US Census data), however an option to demonstrate through other objective measures (i.e., new housing permits) their population for purposes of justifying project costs. Comment 18, pages 4.4.10.3: maximum award amount: Can eligible applicants submit proposal for a suite of planning activities, and if so, what does the maximum award refer to: per activity (as defined in 4.4.10.5 eligible activities) or per application?

Staff Response: The maximum award is by applicant. An application may include a single or all eligible activity under the Resilient Communities Program. More information will be available in the application guide.

Comment Received: Are there limits on how many times a community can apply and limits to how many awards they can receive over a 6-year period? Agency should clarify their intent and anticipate that communities may wish to pursue multiple activities and be provided the flexibility to do so.

Staff Response: For Resilient Communities Program more information will be available in the application guide.

Comment Received: If activities are to be performed in sequence via separate applications, will the applicant be able to apply before closing out the prior contract?

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Section 4.4.10.5, iii: Should include to read, "… zoning ordinance based up on or developed concurrently with a land use plan or comprehensive plan." So as to be consistent per the criteria in 4.4.10.7, v.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Section 4.4.10.5, vi: Public Service activities: With what guidance will the agency follow to review and approve public service activities? For example, do activities include installation of water saving devices? Personal or household disaster preparedness campaigns? Educating grade school youth about risk? Home structural retrofits? Business continuity of operations plans? Promoting the purchasing of insurance via the NFIP, TDI, or the private market? Such a list in lieu of guidance is probably impractical, but the agency should clarify further its intent by way of criteria for hazards, activities, and outcomes.

Staff Response: Public services that have a mitigation purpose and meet HUD's definition of public service will be considered against the various competition scoring criteria.

Comment Received: Section 4.4.10 Resilient Communities Program: If an application is rejected, will the applicant be provided with reasons for the rejection? Will the guidance include an option to petition the agency for reconsideration? An option to reapply after a fixed time after initial rejection? Can they reformulate the proposal and resubmit immediately?

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Section 4.4.1.8 and where repeated elsewhere in plan: If I understand correctly, a city is a "subrecipient" within the overall CDBG-MIT program, and a city is an "eligible applicant" within specific funding programs. In both cases, the entity is the same. This is confusing. When referring to cities (and other local and regional applicants) can the term "eligible applicant" be used?

Staff Response: In some programs, eligible applicants vary beyond just cities.

Comment Received: The 'all or nothing' LMI points is fundamentally flawed element of the scoring matrix as it ignores the challenges of the working moderate-and-fixed income communities. Communities like Ingleside on the Bay are most vulnerable, but do not score high on the 'Vulnerability Index.' This should be remedied. I believe the ICC Energy Conservation Code would be a better standard to apply to mitigation projects over Energy Star, LEED, and ICC Green Building Standards. Contractor requirements should not disqualify smaller local contractors for large national building corporations that will not add to the strength of local businesses.

Staff Response: HUD establishes the way LMI project beneficiaries and the state is being held to a 50% LMI total aggregate requirement; to ensure this is met, the GLO set the competition criteria reflected in this requirement. The building standards are also set by HUD in the Federal Register notice. The Texas General Land Office is committed to meeting all federal and state procurement requirements including its HUB goals.

Comment Received: Healthcare entities should be provided access to funds. The application periods for planning and infrastructure should be staggered to allow potential applicants the ability to meet the HUD objectives. Healthcare entities should be allowed to apply directly to the GLO for CDBG-MIT funds. The Texas General Land Office should clarify which types of healthcare entities may be eligible for CDBG-MIT funds.

Staff Response: Healthcare entities may be sponsored by eligible applicants for projects. The Texas General Land Office is working to ensure mitigation projects may begin as quickly as possible while prioritization is considered.

Comment Received: We request that the comment period for the CDBG-MIT Action Plan be extended at least 60 days in view of the significant information set forth for public analysis and comment.

Staff Response: The Texas General Land Office remains committed to administer CDBG-MIT funds in compliance with all applicable law. As such, the GLO has conducted the required 45-day public comment period required by HUD and, after multiple requests from stakeholders, extended that public comment period to allow for additional feedback.

Comment Received: We request consideration of the following comments to the CDBG-MIT Action Plan: We strongly encourage funding for flood mitigation planning, infrastructure construction, and all relevant floodplain management training to promote a flood resilient Texas. We encourage the GLO to coordinate with the Texas Water Development Board, as well as other state and federal agencies and authorities, to leverage resources and minimize duplication of efforts. We encourage the GLO to share existing and new data developed through the GLO's efforts to ultimately compliment the Texas Water Development's planning efforts.

Staff Response: The Texas General Land Office appreciates the feedback provided in the above-listed comment and will give each point consideration as CDBG-MIT programs and policies progress.

Comment Received: Applications should be selected based on need and management capacity; joint applications should be treated as applications from new entities to encourage regional cooperation.

Staff Response: The Texas General Land Office appreciates the feedback provided in the above-listed comment and will give each point adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: A time to disburse secondary and tertiary rounds of funds should be set; applications for Hurricane Harvey Competition Funds should automatically be considered for other State Action Plan Categories.

Staff Response: The Texas General Land Office appreciates the feedback provided in the above-listed comment and will give each point adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The Texas General Land Office should work with the Texas Water Development Board to leverage SB7 applicants.

Staff Response: The Texas General Land Office appreciates the feedback provided in the above-listed comment and will give each point adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: We would like to commend the GLO for the CDBG-MIT Action Plan's emphasis on the importance of the adoption, implementation, and enforcement of modern building codes.

Staff Response: The Texas General Land Office appreciates the positive feedback provided in this comment.

Comment Received: The CDBG-MIT Action Plan should allocate additional resources to counties identified as MID areas in the 2015 floods. The state should revise the CDBG-MIT Action Plan to make these funds available to all COGs covering MID Counties.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: The Texas General Land Office should reconsider its funding methodology to ensure Cameron County and other low-income, vulnerable areas in South

Texas be allowed equitable access to CDBG-MIT funds in order to protect the health and safety of its residents and become more resilient to future events.

Staff Response: The Texas General Land Office appreciates the feedback provided in the above-listed comment and will give each point adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The Harvey State Mitigation Competition has scoring factors that are problematic. Due to the concerns with the State Competition Program and the benefits of the Regional Mitigation Program, we recommend providing at least $2.1 billion to the Regional Mitigation Program and reducing the State Competition to $500 million.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: LMI does not accurately reflect our populations, especially along the coast. We suggest the scope of the project impact area be expanded to include all communities that may benefit. Counties can collect data to better identify LMI communities, but this would place a large burden on counties -there are other methods to use instead of LMI.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We recommend including a requirement or suggestion for stronger building standards rather than green building codes.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Most counties are ineligible for the Resilient Communities Program as the plan is currently written.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Please provide clarification on the threshold for the LMI goal, what the "project impact area" means, and what Coastal Master Plan projects will be chosen.

Staff Response: The project impact area is the area to be identified by the project in the proposed application. The Coastal Master Plan projects have not yet been identified.

Comment Received: The term "Covered" projects is confusing. We suggest using "Major" projects.

Staff Response: Covered projects is a term defined by HUD in the CDBG-MIT federal register notice.

Comment Received: It is our understanding that fire stations and like-type services would be considered an allowable activity as long as it is not a part of an emergency operations center. Please clarify.

Staff Response: CDBG–MIT funds may be used for mitigation activities to enhance the resilience of facilities.

Comment Received: It is disappointing to see that Emergency Operations Centers are not considered eligible for funding under the CDBG-MIT Action Plan.

Staff Response: All eligible activities are listed in the Action Plan. The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We would like to encourage the GLO to advocate on our behalf before HUD so that, in the future, the LMI requirement does not adversely affect the communities recovering from disasters.

Staff Response: The Texas General Land Office recognizes this comment and remains dedicated to administering CDBG-MIT funding in full compliance with the law. Absent a waiver from HUD, the LMI requirement presented under the correlating Federal Register notice must be followed.

Comment Received: The current Action Plan restricts funds from being used to enlarge a dam or levee beyond its original footprint and this limits flood mitigation measures that could be implemented. Please provide clarification or expand upon the definition of 'communications infrastructure.' The maximum award amounts listed are not inadequate.

Staff Response: The Texas General Land Office recognizes the comments above and presents the following responses:

This statement is accurate. HUD did not waive the restriction on the general conduct of government and so EOCs remain ineligible. The Texas General Land Office has worked with HUD to ensure the allocation of funds consider the Disaster and Mitigation connotation for which they were provided throughout the history of the program. Expansion of dams and levees is specifically restricted in the Federal Register notice. More detail related to program competitions will be provided in future application guides. Competition maximums were set due to the limited funds provided to Texas for mitigation statewide.

Comment Received: We ask that the State Action Plan acknowledge our changing climate by ensuring that mitigation effort promote resilient nature-based solutions and strongly urge projects are selected considering equity and inclusion.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We request that incentive points be added to the scoring criteria to prioritize the implementation of green infrastructure projects that provide multiple benefits to a community while reducing hazard risk.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop. It should be noted that the scoring criteria for eligible applicants can be found in the Action Plan.

Comment Received: We request the GLO see the Green Infrastructure Co-Benefits Valuation Tool and the EPA's forthcoming Community enabled Lifecycle Analysis of Storm Water Infrastructure Costs for guidance on how to value and consider the multi-benefits of green infrastructure.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: There is a lack of definition in the Action Plan for an "impact" and how impact will be scored in the Action Plan. We are concerned that there is a potential to disfavor rural and or smaller jurisdictions in favor of larger jurisdictions due to the lack of definition of project impact. We request a clarification on how the term "Project Impact" will be applied and how this scoring criterion will protect rural or less densely populated areas of the state.

Staff Response: Additional language is being added to the Action Plan to further define Project Impact scoring criteria, and additional information will be available in the application guide.

Comment Received: We agree with Public Citizen and others that wind, solar, and storage power, and gaps in air monitoring should be evaluated. The Texas General Land Office should evaluate solar plus storage as an alternative form of backup power and consider factors including cost lack of fuel requirements, and the benefits of clean energy generation. The Action Plan should note the systemic failure of floating roof tanks during Hurricane Harvey.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We request that the GLO count individual and joint applications under the state mitigation competitions separately, so that joint applications do not count against entities and minimum funding amounts should be removed from the plan.

Staff Response: The Texas General Land Office, in response to the public comment process, is considering altering the cap on the number of applications an entity may submit, either individually or jointly, for CDBG-MIT programs. For final the final cap on number of applications, see the Action Plan.

Comment Received: Entities should be allowed to submit more than one application at a time. FEMA's BCA contains inherent inequalities; the GLO should reserve funds to provide technical assistance to communities which lack the resources or knowledge to apply for CDBG funds.

Staff Response: The Texas General Land Office, in response to the public comment process, is considering altering the application cap for CDBG-MIT programs. For final application caps, see the Action Plan.

Comment Received: When considering buyouts, the state should target the most vulnerable neighborhoods and severe repetitive loss structures. Buyouts should provide homeowners with enough money to relocated to safer areas, coordinate with increased access to affordable housing and relocation strategies.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We are supportive of the GLO to develop an Enhanced State Hazard Mitigation Plan (the Plan). The Plan needs to acknowledge climate change. We are supportive of choosing Tier 1 projects in the Coastal Master Plan.

Staff Response: The Texas General Land Office recognizes this comment and appreciates the positive feedback.

Comment Received: We would encourage the GLO to give preference to living shorelines for shoreline stabilization and wet land enhancement, land acquisitions, and habitat creation and restoration.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: While we are generally supportive of the Resilient Communities Program, we think that the minimum standards discussed are too modest. See the Texas Health and Safety Code, Chapter 388 and the 2015 IRC for increased standards.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: There was confusion in the past about what constituted a complete application for the past Hurricane Harvey homeowners' programs. The Texas General Land Office should allow for an appeal process for homeowners who were unaware of how to get on to the past waitlist or what counted as a complete application. The Texas General Land Office should review contractor performance to ensure that applicants were not terminated from the program through no fault of their own.

Staff Response: The Texas General Land Office remains committed to ensuring all program applications are given adequate consideration and, in the event of a denial for assistance, documented reasoning behind that denial. Internal processes and procedures will be in place to ensure that any denied applicants will be given ample opportunity to address any identified issues.

Comment Received: The mitigation home programs should include Harris County and Houston homeowners.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We ask that GLO provide incentives for plans to include green infrastructure and advanced electrical systems such as battery storage back up power and microgrids.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We are supportive of CEER and the HOME coalition that emphasize the need to assure that residential buyout programs must be equitable, avoid displacement and gentrification and also emphasize communities facing threats from flooding and toxic pollution.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: The state must provide legal assistance to homeowners to help show clear titles, mobility counseling, and real estate assistance. We agree with the National Wildlife Federation that the Action Plan needs to explain further how the GLO will establish and engage with the Citizen Advisory Committees.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: It is extremely important that the citizen advisory committees include representatives from underserved and underrepresented communities to make sure that all Texans are heard.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: The incorporation of nature-based solutions and blue-green measures into the planning process is vital to creating an effective and durable statewide system that protects and bolsters disaster-prone areas.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Prioritization should be given to the restoration of natural channels and waterways.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Emphasis should be placed on conservation and restoration within the watershed.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Green and natural infrastructure should be explicitly defined to include to preservation of floodplains, the protection of bayou and riverine corridors, as well as landscape level land protection efforts.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: A definition and expansion of green infrastructure incentives for land use and comprehensive plans should be presented.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Minimum project amounts should be eliminated.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: More clarity is needed on the 'Project Impact" scoring criteria.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: There should be a meaningful prioritization and incentivization for green infrastructure and nature-based solutions.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: We recommend that the 2015 and 2016 Floods State Mitigation Competitions and the Hurricane Harvey State Mitigation Competition be modified to add incentive points to the scoring criteria to prioritize the implementation of green infrastructure projects.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Nature-based coastal resilience should be defined.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The Texas General Land Office's current methodology framework fails to consider issues of community vulnerability and equity used to create the selection criteria for CDBG-MIT programs.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Why was the South Carolina version of the SVI selected?

Staff Response: The State of Texas previously utilized the South Carolina version of SoVI for its 2015 Floods, 2016 Floods, and Hurricane Harvey Action Plan. The South Caroline SoVI is also used by FEMA in its National Risk Index tool to identify areas of high risk.

Comment Received: Which variables are used in this version of the South Carolina Hazard Vulnerability Institute's SVI?

Staff Response: The list of SoVI variables are located in Appendix F.

Comment Received: Is proximity to environmental hazards considered as part of the SVI analysis?

Staff Response: No, social vulnerability is determined solely through socioeconomic and demographic data.

Comment Received: On page 155 of the Action Plan, it is not clear whether the state has mapped the SVI scores or z-scores for each county on the provided map. Please clarify.

Staff Response: The SoVI score is created by summing all the component scores resulting from the PCA. The SoVI score is a relative score, not an absolute score – meaning that a place with a SoVI score of 10 is not 2X more vulnerable than a place with a SoVI score of 5.

Comment Received: Why is the state using the county as the unit of analysis for SVI? If the end goal is to ensure that CDBG-MIT funds mitigate risk in the most affected areas, determining SVI score at the county level rather than at a lower geographic level means that areas with greater economic inequality will have lower SVI scores, even if there are areas within those counties with very high levels of social vulnerability. This may steer funds away from the hardest-hit areas that are most affected by pre-existing inequities and where mitigation funds would be most effective.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: While lack of vehicle access is one of the 15 SVI indicators, very little of the CDBG-MIT Action Plan pertains to the transportation/mobility vulnerability of families. Generally, the Action Plan does not address the affordable transportation needs of individuals and families, including persons with disabilities and other high-risk populations, in light of disaster recovery and longer-term affordable housing. How will the plan take into account short term and longer-term transportation needs of families?

Staff Response: The CDBG-MIT Action Plan provides for the submittal of infrastructure mitigation projects. All applications are subject to the scoring and eligibility criterion of their applicable program.

Comment Received: We recommend that the GLO remove the requirement that no applicant will be awarded their subsequent application until all successful eligible applicants have been awarded funding at least once.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress

Comment Received: We recommend that the cap on application submissions should be removed by eliminating the credit against entities for regional applications.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress

Comment Received: We encourage the GLO to use other criteria in making BCA assessments.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress

Comment Received: We recommend the GLO specifically state how it intends to fulfill public participation requirements, including website requirements.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress

Comment Received: Any evaluations used for deploying CDBG-MIT funds should include the duration of electricity interruption like FEMA's BCA approach, e.g., size of the population served and the power interruption duration at that location. Replace the term backup generator in draft (CDBG-MIT) with microgrid. Microgrids are fuel-flexible, resilient, and with energy control centers attached can manage onsite energy sources most efficiently even during an active main grid. Texas should focus on hardening town squares or creating resiliency zones where multiple facilities can be configured into a microgrid that keeps critical infrastructure, fire, police, hospitals and other first responders with vulnerable populations like affordable housing, senior centers, and assisted-living facilities in service. Allow use of CDBG-MIT funds for design of microgrids and allow Energy as a Service (EaaS) contracts for microgrids. The pathway to resiliency and reliability for all hazards is Texas moving forward aggressively with deployment of Microgrids.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: For the three State Mitigation Competitions (2015 Floods, 2016 Floods, Harvey), the first four criteria account for 50 possible points out of a total 100 possible points (except for Harvey, where an additional 5 points may be gained for "Mitigation / Resiliency Measures" – clarification on what this is and why it was specifically added here would be helpful). It is our analysis that without ranking highly in these four areas, it will be difficult for some applicants to succeed in advancing high-impact projects. Yet, for some (if not many, in the Coastal Bend) applicants, it will be impossible to rank highly. CDI, SoVI, per capita market value, and LMI need to be altered in regard to the scoring criteria.

Staff Response: Additional information will be available in the application guide to further define mitigation/resiliency measures.

Comment Received: More funds need to be allocated to the overall program funds of the Regional Mitigation Program. Further, we are encouraged to see GLO list academia as key partners in building resilience and mitigating risk (pg. 185). We note that along the entire Texas coast but especially in the Coastal Bend, HRI and TAMUCC also add capacity for our communities. In particular, HRI/TAMUCC and the Coastal Bend COG have recently signed an MOU to formalize this alignment through establishing the Regional Resilience Partnership (RRP).

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: What is required of an organization or political subdivision to receive a direct allocation? Is this something that the San Jacinto River Authority (SJRA) would be eligible to receive?

Staff Response: All CDBG-MIT funding must be properly applied for under a requisite program presented under the Action Plan. To determine which program which best suit the needs of this entity, see the Action Plan.

Comment Received: River Authorities are only eligible for the Hurricane Harvey State Mitigation Competition. With the SJRA being within the state MIDS and the HUD MIDS is there a specific reason we are not eligible applicants for the other funds? Could river authorities become eligible applicants for the other funds within the action plan, e.g., the 2016 Floods State Mitigation Competition?

Staff Response: River Authorities are not eligible applicants for the 2016 Floods State Mitigation Competition due to the limited funds available. These types of entities would need to be sponsored by an an eligible applicant.

Comment Received: The Texas General Land Office and the "Action Plan seems to be supportive and encouraging of more regional projects, however the limitation on how many applications an organization can submit limits regional projects that would do best utilizing partnerships. This will be a deterrent and also will disincentives organizations wanting to submit joint applications.

Staff Response: The Texas General Land Office, in response to the public comment process, may alter the application cap required for one or all of the state mitigation competitions. For final application caps, see the Action Plan.

Comment Received: As an elected official representing portions of Harris, Fort Bend, and Brazoria counties, flood mitigation is of utmost importance to me and my constituents of

Senate District 17. I appreciate the GLO's willingness to work with federal, state, and local officials to coordinate cooperation efforts that are as efficient as possible.

Staff Response: The Texas General Land Office appreciates this feedback.

Comment Received: We encourage the GLO to set a base building code year that all jurisdiction must comply with to be eligible for funds. We recommend that the GLO further articulate that it is willing to support and fund adoption of code-plus amendments in communities seeking to address local hazards. We recommend that the GLO require a FORTIFIED Sealed Roof Deck for any homes assisted with CDBG-MIT assistance.

Staff Response: The Texas General Land Office recognizes and appreciates the content of this comment and remains dedicated to ensuring that any and all means of fostering successful disaster mitigation practices under the CBBG-MIT allocation are given adequate consideration.

Comment Received: DeWitt County Drainage District No. 1 would like to heavily emphasize that entities like ours should be eligible subrecipients for funding. Programs, eligibility, deadlines, and applications should be easy to understand and not require a profession grant-writer response.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We urge the GLO to provide assistance to smaller entities as they compile applications for CDBG-MIT funds. Please provide a specific program, that the district would be eligible for, that addresses buyouts in flood prone areas.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop. It should be noted that the GLO remains committed to ensuring eligible applicants are given necessary technical guidance and assistance from the application process through project closeout.

Comment Received: Our community has an enormous need for floodplain mapping and we encourage the GLO to fund a study that would map the floodplains within the entire state. The 'Repetitive Loss (NFIP) from Flooding' metric is skewed in our area as only one property is classified as such. Consideration should be given to this fact.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We urge the reclassification of DeWitt County under the 'Social Vulnerability Index.'

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: The "per capita market value by County' metric is skewed in our area and special consideration should be given.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: As a tool to contractors, the GLO should creating a list on its website that shows all of the regulating authorities within a certain area. The district requests the GLO define 'local government' as the legislature does to include entities like the district.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We ask that another metric be considered instead of the 'Hazard Mitigation Grant Program (HMGP): Supplemental."

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: We recommend the GLO provide incentive points for green infrastructure projects.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We recommend that projects that provide multiple co-benefits to a community while reducing hazard risk should receive more priority points than projects that provide fewer co-benefits.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We request the GLO incorporate an incentive for the use of green infrastructure as part of the Land Use and Comprehensive Plans in the Eligibility/Selection Criteria of Section 4.4.10.8.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We request clarification on how the term "Project Impact" will be applied and how this scoring criterion will protect rural or less densely populated areas of the state.

Staff Response: Additional language is being added to the Action Plan to further define Project Impact scoring criteria, and additional information will be available in the application guide.

Comment Received: We strongly believe that need-based considerations should outweigh a desire to spread resources around equally.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We urge to GLO to remove the application cap and to count individual and joint applications separately, so that a joint application does not count against individual applications. We urge the GLO to remove the ban on awarding an entity a second project until all successful eligible applicants have been awarded at least once.

Staff Response: The Texas General Land Office, in response to the public comment process, may alter the minimum award amounts and the application cap required for one or all of the state mitigation competitions. For final minimum award amounts and application caps, see the Action Plan.

Comment Received: We request that the minimum award amounts be removed altogether for all three state mitigation competitions.

Staff Response: The Texas General Land Office, in response to the public comment process, may alter the minimum award amounts required for one or all of the state mitigation competitions. For final minimum award amounts, see the Action Plan.

Comment Received: We suggest giving greater weight to the low and moderate income national objective selection criteria, rather than the BCA. We request that the SoVI score of the area to be served by a project be added to the selection criteria under Section 4.4.5.10 so that all SoVI scores will be calculated at the census tract level.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We request the GLO make technical assistance readily available to communities unfamiliar with the process for applying for CDBG funds.

Staff Response: The Texas General Land Office, as the primary administrator of CDBG-MIT funds, remains committed to ensuring all eligible applicants are given the necessary technical

guidance and assistance to successfully accomplish program goals. Technical assistance will be available to from the application intake process through project closeout.

Comment Received: We recommend that the GLO and TDEM work together to ensure that the Enhanced SHMP incorporates climate change projections and considerations. We urge the GLO to significantly increase the amount of funding allocated to Coastal Resiliency Program to ensure sufficient funding for multiple projects.

Staff Response: The Texas General Land Office remains committed to coordinating with local, state, and federal entities to ensure CDBG-MIT funds are administered in the most effective and efficient manner possible. All final funding amounts for CDBG-MIT programs can be found in the Action Plan.

Comment Received: We encourage the GLO to give preference to the following types of projects: living shorelines, land acquisitions, and habitat creation and restoration. The HUD and state-designated 'most impacted and distressed areas' need to be well-represented in the Citizen Advisory Committees.

Staff Response: The Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The Texas Floodplain Management Association fully supports the comments submitted by the DeWitt County Drainage District No. 1.

Staff Response: The Texas General Land Office recognizes the Texas Floodplain Management Association's support of the DeWitt County Drainage District No. 1 comments.

Comment Received: We recognize and stand behind the following initiatives: pre- and post-disaster flood protection actions, community outreach on floodproofing options, grant funding and a revolving loan program, flood insurance discounts for all flood mitigation efforts, encouraging communities to inventory high-risk buildings below the BFE, outreach and education, stronger floodplain regulations, stronger flood design standards and codes and enhancements in the engineering practice, support a national standard for flood-resistant construction, and home elevation contractor certifications. We also endorse the following proposals of more funding should be allocated towards residential home elevation and community adoption of ASCE 24 Building Codes and ordinances the require building above the 500-year flood plain.

Staff Response: The Texas General Land Office recognizes and appreciates the positive feedback provided within the contents of this comment.

Comment Received: We support funding for hazard mitigation planning, projects, and training related to FEMA lifelines.

Staff Response: The Texas General Land Office recognizes and appreciates the supportive feedback provided in this comment and will give the other listed recommendations adequate consideration as CDBG-MIT policies and procedures progress.

Comment Received: We encourage the GLO to coordinate with other state and federal entities to avoid duplication of efforts and provide transparency in the development of data sharing. We encourage the GLO to coordinate with regional regulatory entities to ensure mitigation techniques are supported by the region.

Staff Response: The Texas General Land Office recognizes and appreciates the supportive feedback provided in this comment and will give the other listed recommendations adequate consideration as CDBG-MIT policies and procedures progress.

Comment Received: The Texas General Land Office should consider that there is value in encouraging local government plans that incorporate risk reduction with projects other than zoning, such as updated ordinances or CIPs.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: Please provide additional information about the 'Mitigation/Resiliency Measure' scoring factor. The 'Leverage' factor should either be removed entirely or waived for small jurisdictions with a population of 5,000 or less.

Staff Response: The Texas General Land Office recognizes the comments presented and will give each individual point adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: City applicants should be allowed to use to adjusted scores for the SoVI and per capita market value based on the jurisdiction's data.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We support the recommendation provided by H-GAC to provide $2.145 million to the Regional Mitigation Program and $500 million to the Harvey State Mitigation Competition Program.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comments Received: The Texas General Land Office should consider a higher, flexible award maximum for the Local Hazard Mitigation Action Plans.

Staff Response: The Texas General Land Office recognizes the comments presented above and will give each individual point adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: We request incentive points be added to the scoring criteria to prioritize the implementation of green infrastructure projects that provide multiple benefits to a community while reducing hazard risk.

Staff Response: All scoring criteria will be presented in final form in the HUD accepted and published Action Plan document.

Comment Received: We request clarification on the term 'Project Impact' and how it will be applied.

Staff Response: 'Project Impact' will be further defined in forthcoming application guides.

Comment Received: We ask the GLO consider the following changes: (1) elimination of the $100 million limit and/or raise the number of applications to 5; (2) treat regional applications from regional entities as applications from new entities and omit maintenance partners as co-applicants; (3) set a time to disburse secondary and tertiary rounds of funds; (4) allow applications for Hurricane Harvey Competition Funds to automatically be considered for other State Action Plan categories; and (5) work with the Texas Water Development Board to leverage SB7 applications.

Staff Response: The Texas General Land Office recognizes the five recommended changes listed in this comment and will give each adequate consideration.

Comment Received: We request the GLO make technical assistance available to communities unfamiliar with the CDBG funding process. We recommend the GLO and TDEM work together to ensure that the Enhanced SHMP incorporates climate change projections and considerations.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in the most effective manner possible. This includes the provision of technical assistance, when warranted, to communities needing assistance throughout the life of the grant.

Comment Received: We encourage the GLO to give preference to living shorelines, land acquisitions, and habitat creation and restoration. We believe that the most impacted and distressed areas need to be well represented in the Citizen Advisory Committees.

Staff Response: The Texas General Land Office remains dedicated to working with state and federal entities to coordinate the most effective administration of the CDBG-MIT funding. The

Texas General Land Office appreciates this feedback and will give it adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The city of Houston and Harris County have submitted technical changes to the CDBG-MIT Action Plan in an effort to reduce risk and make the region more resilient to future events. I encourage the GLO to amend the Action Plan accordingly.

Staff Response: The Texas General Land Office recognizes the comments provided by the city of Houston and Harris County and will give each of those comments adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The current CDBG-MIT Action Plan will likely result in funding activities in violation of the GLO's responsibility to affirmatively further fair housing and its requirements under Title VI of the Civil Rights Act of 1964.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: The Texas General Land Office must set aside mitigation funding specifically for the low-income communities of color that have historically been the most negatively impacted by natural disasters.

Staff Response: The Texas General Land Office remains committed to ensuring CDBG-MIT funds are administered in compliance with federal law, including the LMI benefit requirement.

Comment Received: We request the GLO prioritize and provide funding for mitigation projects in the following communities: (1) the north side of Galveston Island; (2) the Black community in the city of Wharton; (3) the low-income and Latino subdivisions in Liberty and Montgomery Counties; (4) those principally Black and Latino neighborhoods in northeast Harris County; (5) the principally Black communities of West Port Arthur and northern Beaumont; and (6) the Greenpoint neighborhood in the northern part of Houston.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: The Texas General Land Office should make funds available specifically to address the needs of tenants in HUD-subsidized, privately owned apartment developments that are located in the 100-yer floodplain and/or floodways.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We request the GLO establish a pilot program that would permit the transfer of subsidies from obsolete, dangerous, poorly managed, and undesirable apartments to more desirable apartments.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: The Texas General Land Office's website should contain sufficient demographic information about each funded activity so that the general public can better understand who is being served by the projects and studies.

Staff Response: The Texas General Land Office remains committed to ensuring all public transparency requirements established under federal law are followed. This includes all website requirements detailed in the applicable correlating Federal Register notice.

Comment Received: The Texas General Land Office should consider inclusion of maps of funded activities with links to applications and demographic information on its website in order to help facilitate public access.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: All waivers and alternative requirements should be made publicly available on the GLO's website.

Staff Response: The Texas General Land Office remains committed to ensuring all public transparency requirements established under federal law are followed. This includes all website requirements detailed in the applicable correlating Federal Register notice.

Comment Received: The Texas General Land Office should consult with community groups, tenants, and neighborhood organizations as projects are selected for funding.

Staff Response: The Texas General Land Office remains committed to conducting CDBG-MIT programs in a manner that fosters a robust public participation process to ensure all impacted citizens are included.

Comment Received: The Social Vulnerability Index and Financial Capacity criterion should be assessed on a Census tract level.

Staff Response: For programs in which SoVI and Financial Capacity are considered as scoring criteria, both factors will be assessed at the applicant level if data is available. County and city-level data will be made available to applicants.

Comment Received: What are the break points for each category: high, medium high, medium, medium low, and low and how were those break points determined? How will the SVI score and Financial Capacity score be used in the application process? What are the weights of each metric? What types of property (residential, commercial, industrial, etc.) are considered for the financial capacity score? Program income should be reinvested into LMI communities.

Staff Response: The SoVI score is created by summing all the component scores resulting from the PCA. The SoVI score is a relative score, not an absolute score – meaning that a place with a SoVI score of 10 is not 2X more vulnerable than a place with a SoVI score of 5.

The SoVI score is based on the following classification using Standard Deviations.

For 5 classes

i. <-1 Std. deviations around mean = Low
ii. -1 - .5 Std. deviations around mean = Medium Low
iii. -.5 - .5 Std. deviations around mean = Medium
iv. .5 – 1 Std. deviations around mean = Medium High
v. > 1 Std. deviations around mean = High

Comment Received: The CDBG-MIT Action Plan must ensure that the following information about each MOD be publicly available on the GLO's website: (1) description of the project; (2) amount funded; (3) demographics of residents being served; (4) breakdown of how many homeowners and renters the project is benefiting; (5) neighborhood; and (6) that the project will serve by block group.

Staff Response: The Texas General Land Office remains committed to ensuring all public transparency requirements established under federal law are followed. This includes all website requirements detailed in the applicable correlating Federal Register notice.

Comment Received: As it relates to the HMGP Supplemental: The Texas General Land Office must ensure that affirmative steps are taken to ensure there are no discriminatory effects on vulnerable populations through the administration of this program.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: As it relates to the Coastal Resiliency Program: For projects identifying themselves as LMI-benefitting, subrecipients should also meet additional criteria.

Staff Response: All applications submitted for funding consideration under a CDBG-MIT program will be prioritized pursuant to the applicable eligibly requirements for that program. For more information on eligibly requirements, see the Action Plan.

Comment Received: The 50% set aside for LMI residents should prioritize projects that help communities harden themselves against the impact of industrial emissions, spills, and explosions that may result from natural disasters.

Staff Response: All applications submitted for funding consideration under a CDBG-MIT program will be prioritized pursuant to the applicable scoring criteria for that particular program. For more information on applicable scoring criterion, see the Action Plan.

Comment Received: A pilot program should be established to implement Rapido housing and test the process.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: All Hazard Mitigation Plans must acknowledge racism, segregation, and underinvestment in low-income neighborhoods. Any land use or zoning plan funded through the Resilient Communities Program must include efforts to mitigate any discriminatory land use decisions.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: We strongly recommend that any study of, or database of, 'natural hazard risks' should include risks associated with living near an industrial facility. We disagree with HUD's assessment that the elimination of blight and slum as a national objective is generally inconsistent with mitigation activities.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We support the decision to create a citizen advisory committee but suggest the GLO reserve at least two positions for community group leaders for low-income communities of color that have been impacted by natural disasters and whose group works to assist community members with disaster recovery.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as citizen advisory committees for CDBG-MIT programs and policies develop.

Comment Received: We requests the following modifications to the CDBG-MIT Action Plan: (1) we request section 2.3 be modified to expressly include the preservation of floodplains, the protection of bayou and riverine corridors, as well as large landscape level land protection efforts; and (2) we request section 2.6.25.2 be modified to delete 'channeling creeks' as a mitigation effort and replaced with 'restoring the natural channels of creeks and waterways, thereby slowing the flow, decreasing incision, and reconnection such channels with the floodplains.'

Staff Response: The Texas General Land Office recognizes this comment and will give the requested modifications adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We suggest adding the following to the definition of natural or green infrastructure: 'including the conservation and restoration of floodplains, the conservation and restoration of creeks and bayous, as well as large landscape level protection efforts.'

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We request that the 2015 and 2016 Floods State Mitigation Competition be modified to add incentive points to the scoring criteria to prioritize implementation of green infrastructure. We request that programs be revised to ensure that distribution is proportional to the impact of Hurricane Harvey and the previous storms for areas that are highest risk.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as CDBG-MIT programs and policies develop.

Comment Received: We urge the GLO to remove the application number cap and replace it with a cap related to the amount proportional to the statutory citation and documented risk. The application cap should be removed to avoid penalizing regional projects.

Staff Response: The Texas General Land Office, in response to public comments, has decided to alter the application cap as it relates to some or all of the state mitigation competitions. Final application caps will be contained within the Action Plan.

Comment Received: We urge the GLO to remove the ban on awarding second projects until all successful eligible applicants have been awarded funding at least once. We request that the minimum award amounts be removed altogether for all three state mitigation competitions. We request the equity concerns be addressed by adjusting the weight of some scoring criteria. Green Infrastructure should be defined and expanded as an incentive for Land Use and Comprehensive Plans.

Staff Response: The Texas General Land Office recognizes this comment and will give each point it contains adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: We encourage the GLO to provide incentive points for green infrastructure projects. We request the GLO incorporate an incentive for the use of green infrastructure as a part of the Land Use and Comprehensive Plans in the descriptions within Section 4.4.10.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as policies for the Land Use and Comprehensive Plans under the CDBG-MIT programs develop.

Comment Received: We believe that a needs-based consideration should outweigh a desire to spread resources around equally.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: We suggest giving greater weight to the low- and moderate-income national objective scoring criteria. We request that the SoVI score of the area to be served by a project be added to selection criteria under Section 4.4.5.10.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: We recommend the GLO and TDEM work together to ensure that the Enhanced SHMP incorporates climate-change projections and considerations.

Staff Response: The Texas General Land Office remains dedicated to coordinating with local, state, and federal entities to ensure CDBG-MIT funds are administered in the most effective and efficient manner possible.

Comment Received: We urge the GLO to significantly increase the amount of funding allocated to Coastal Resiliency Program to ensure sufficient funding for multiple projects.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: We encourage the GLO to give preference to the following types of projects: living shorelines, land acquisitions, and habitat creation and restoration. The HUD and state-designated 'most impacted and distressed areas' need to be well-represented in the citizen advisory committees.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: The limitation on number of applications discourages collaboration and should be removed. The $100 million project cap is insufficient to enable adequate mitigation work in the communities that need it the most. The Texas General Land Office should eliminate the project timeframe that places a limit on the number of project applications for each entity that may submitted/funded at a time.

Staff Response: The Texas General Land Office is updating the eligibility requirements of the Hurricane Harvey State Mitigation Competition in response to this comment and others.

Comment Received: Multiple Harris County entities have submitted technical changes that should be included in the final version of the CDBG-MIT Action Plan. The changes sought would reduce the risk in areas like my district and make the area more resilient to future floods. I hope the CDBG-MIT allocation will provide a chance for the GLO to address issues with residents who were excluded from programs because of the benefits they received under an SBA loan. We appreciate the work the GLO does for Texas as well as the leadership of Commissioner Bush

Staff Response: The Texas General Land Office appreciates this feedback and support for the CDBG-MIT Action Plan.

Comment Received: An equitable and effective mitigation strategy must include the following: (1) the prioritization of equity in all programs; (2) the prohibition against using disaster recovery and mitigation processes to permanently displace low-income communities and communities or of color, or to facilitate displacement by gentrification; (3) input from affected communities that recognizes communities that are least able to participate in conventional processes; (4) the provision of resources under buyout and relocation programs that present low income families with a meaningful choice to move; (5) and the mitigation of industrial and hazardous uses on communities.

Staff Response: The Texas General Land Office recognizes the content of this comment and will give each point presented adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Eligibility analysis that utilizes property values fail to prioritize LMI families and communities.

Staff Response: Eligibility analysis does not utilize property value. The Regional Mitigation Program and the 2015, 2016, and Hurricane Harvey scoring criteria utilize per capita market value as a factor, with those areas with a lower per capita market value receiving higher scores. LMI is an additional scoring criteriom in those three competitions.

Comment Received: Why does the Composite Disaster Index methodology include disasters for which CDBG-MIT funds are not available, including wildfires, drought, and hail? The Composite Disaster Index does not account for future risk.

Staff Response: The Composite Disaster Index shown in the Risk and Hazards Assessment is illustrative of the hazards faced by the state and seeks to show the severity of all hazards in order to determine where limited funds should be directed. Predictive modelling of future risk uses past occurrences to determine patterns and predict future occurrences. This is the method used by the CDI.

Comment Received: Why does the calculation for the Composite Disaster Index include all 254 counties in Texas, and not solely the 140 counties eligible for CDBG-MIT funds?

Staff Response: The 254 county CDI map series contained within the Risk and Hazards Assessment is used to illustrate the distribution of hazard risk throughout the state. For purposes of allocating funds within the Regional Mitigation Program and as scoring criteria in the 2015, 2016, and Hurricane Harvey Competitions, the CDI utilizes only the 140 eligible counties.

Comment Received: Why does the state use the same Composite Disaster Index for all three competitive grant programs when the 2015 and 2016 programs include tornadoes as an eligible hazard and the Hurricane Harvey program does not?

Staff Response: The CDI is one component of the scoring criteria for these competitions, worth 10 points. The purpose of the CDI is to illustrate all hazard risks within the eligible communities.

Comment Received: The Texas General Land Office should create a separate Composite Disaster Index for each competition that connects directly to the correlating hazards and applies only to the counties eligible for each program's funds.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: How was the grouping of variables for the Principle Component Analysis done and how did the state determine which variable went into Principal Components?

Staff Response: The research conducted by Cutter et al. (2003), "Social Vulnerability to Environmental Hazards," forms the basis for variable selection. This work identified vulnerable population groups impacted by disasters and then identified appropriate representative variables for each population. This large set of data was reduced by removing variables that were colinear (measuring the same things) so that double counting could be minimized. The resulting set of variables became the standard list of inputs with only subtle additions as better data has become

available that address specific vulnerability indicators with no former variables (in the census) that were appropriate representations of the concept

SoVI is an output of a Varimax Rotation Principle Components Analysis. Grouping of variables is a result of the PCA; specifically, the cutoff eigenvalue is determined by the Kaiser Criterion—a commonly used criterion for the number of factors to rotate is the eigenvalues-greater-than-one rule proposed by Kaiser (1960). It states that there are as many reliable factors as there are eigenvalues greater than one. The reasoning is that an eigenvalue less than one implies that the scores on the component would have negative reliability. The number of "groups" is not pre-determined, only the cutoff value for inclusion into groups. This method produces a different number of "components" for each SoVI run.

Comment Received: In the map on page 155, is it not clear whether the state has mapped the SoVI scores or z-scores for each county. Please clarify this. What are the breakpoints for each category: high, medium high, medium, medium low, and low and how are those breakpoints determined?

Staff Response: The SoVI score is created by summing all the component scores resulting from the PCA. The SoVI score is a relative score, not an absolute score – meaning that a place with a SoVI score of 10 is not 2X more vulnerable than a place with a SoVI score of 5.

The SoVI score is based on the following classification using Standard Deviations.

For 5 classes

vi. <-1.5 Std. deviations around mean = Low
vii. -1.5 - .5 Std. deviations around mean = Medium Low
viii. -.5 - .5 Std. deviations around mean = Medium
ix. .5 – 1.5 Std. deviations around mean = Medium High
x. > 1.5 Std. deviations around mean = High

Comment Received: Why is the state using the county as the unit of analysis for the SoVI? How will the Action Plan take into account short term and longer term transportation needs of at-risk families?

Staff Response: For the risk assessment the county geography was used to illustrate the general distribution of social vulnerability across the state. Smaller geographies are not visible at the scale used. For the Regional Mitigation Program allocation, the county geography was chosen to align with the other allocation factors which are represented at the county geography and are easily aggregated at the COG level to determine total funding for the COGs to distribute. For the scoring criteria used in the three competitions described in the Action Plan, applicants will be able to utilize SoVI at the census tract or municipal level.

Comment Received: In response to the per capita market value ("PCMV"): We appreciate that the PCMV was calculated for the universe of eligible counties only. Please explain how the categories were determined and how the breaks were decided.

Staff Response: The categories shown on the PCMV map represent modified Natural Jenks breaks.

Comment Received: We appreciate that the goal of PCMV as a criterion is to ensure that funds target areas with less capacity to conduct mitigation programs. We urge the GLO to determine the possibility that a program will fuel gentrification and channel resources away from the most vulnerable populations these mitigation funds are intended to serve and to require serious strategies to mitigate that displacement.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: In response to the Project in the Local Plan: The Texas General Land Office should allow an entity to be a part of multiple joint applications (as lead or as a partner) to foster collaboration while giving entities access to funding. We recommend that the GLO cap on application submissions be removed by eliminating the credit against entities for regional applications.

Staff Response: The Texas General Land Office, as a result of the public comment process, has decided to alter the application limit to address any concerns associated with discouraging collaboration and/or steering funds away from the most impacted areas. For the final application limit, see the Action Plan.

Comment Received: In response to Management Capacity: The Action Plan must include a detailed description of how these scoring criteria are defined and how they relate to ensuring capacity.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: Regarding Project Impact: How will "cost per persons benefiting" and "percentage of persons benefitting within the jurisdiction" be determined? How will the number of persons benefiting from a particular project be determined?

Staff Response: "Project Impact" will be further defined in forthcoming application guides.

Comment Received: Will this be a standard formula, or can each applicant determine this for themselves? Will there be a clear set of criteria and data by which costs and benefits must

be determined by each applicant? The ranking itself is not clear. Is there a certain threshold that must be met and how will this help rank applications over a certain threshold?

Staff Response: "Project Impact" will be further defined in forthcoming application guides.

Comment Received: In response to leveraging funds: We believe that the requirement to leverage CDBG-MIT funds with other funding sources may disadvantage larger regional projects with larger requests for CDBG-MIT funds.

Staff Response: The Texas General Land Office recognizes the content of this comment will give each point presented adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: In response to the Mitigation and Resiliency Measures: It is unclear how this criterion is defined. Are these measures taken by the applicant before submitting the application? Are the measures included in the application? Does this disadvantage less-wealthy jurisdictions that have not had the resources to take these measures?

Staff Response: "Resiliency Measures" will be further defined in forthcoming application guides.

Comment Received: Other scoring related issues: The Action Plan's use of a county scale analysis will not accurately identify the most impacted and distressed areas, where LMI populations live, or where social vulnerability is the most prevalent. Giving Repetitive Loss properties the strongest weight allocation broadly discriminates against most low-income families, who tend to not have flood insurance.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: The Action Plan fails to include sufficient information so that all interested parties will be able to understand and comment. Needs-based considerations most be included in assessing awards with a prioritization on high-risk areas with the most vulnerable populations.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: As it relates to Public Participation: The comment period and the state's time to respond to comments are insufficient and the comment period are insufficient, and the state should request an extension to the deadline to submit the Action Plan to HUD.

Staff Response: The Texas General Land Office has, in compliance with all applicable federal law, published the draft CDBG-MIT Action Plan for the required and conducted the required public hearings. In going beyond these requirements, the GLO extended the public comment

period beyond the 45-day mandate and held an additional public hearing to ensure the most robust public participation process possible.

Comment Received: The Citizen Advisory Committee must include members from the most affected communities and historically disinvested areas, and members of protected classes. There must be increased transparency and public access to information about CDBG-MIT and CDBG-DR funds and programs on an ongoing basis.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as the citizen advisory committee under CDBG-MIT programs develop.

Comment Received: As it relates to Use of Funds: We want to emphasize that while we endorse the use of these funds for larger, high-impact projects, those projects may need to include targeted local infrastructure investments to ensure that they provide mitigation for everyone in the project area.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: For the 2015 Floods State Mitigation Competition and the 2016 Floods State Mitigation Competition: Limiting each applicant to 2 applications, including both individual and joint applications, discourages collaboration and may steer funds away from the most impacted areas.

Staff Response: The Texas General Land Office, as a result of the public comment process, has decided to alter the application limit to address any concerns associated with discouraging collaboration and/or steering funds away from the most impacted areas. For the final application limit, see the Action Plan.

Comment Received: For the Hurricane Harvey State Mitigation Competition: Projects must prioritize people over property value.

Staff Response: Eligible applications submitted for consideration under the Hurricane Harvey State Mitigation Competition will be scored and prioritized according to the scoring criterion presented in the Action Plan.

Comment Received: The category of eligible applicants is much broader than historically eligible entities and, as such, that state must ensure that all of these entities are trained on their obligations under federal law.

Staff Response: The Texas General Land Office, as the primary administrator of CDBG-MIT funds, remains dedicated to providing necessary technical guidance and assistance to eligible

entities who may require it. This technical guidance and assistance includes the provision of training on the obligations placed on a subrecipient under federal law.

Comment Received: For the Regional Mitigation Program: The Action Plan contains no information on the required methodology for MODs beyond that fact that it 'allows the opportunity for local quantifiable factors.'

Staff Response: General Land Office appreciates the feedback contained within this comment and will give adequate consideration as CDBG-MIT programs and policies progress. It should be noted that all MODs must undergo processing at the local level and be submitted for approval to the GLO.

Comment Received: As it relates to the Hazard Mitigation Grant Program Supplemental: The state must evaluate whether the FEMA HMGP criteria and planning process have a discriminatory effect and/or steer funding away from lower-income communities and communities of color.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: As it relates to the Coastal Resiliency Program: Please explain why this program can fund risks related to coastal erosion and includes protection of FEMA lifelines as a priority.

Staff Response: Coastal mitigation considers all efforts to arrest impacts of future to include natural solutions.

Comment Received: As it relates to the Housing Oversubscription Supplemental: We applaud the inclusion of this program; however, residents of Houston and Harris County should be eligible.

Staff Response: The Texas General Land Office appreciates the positive feedback contained within this comment and will give adequate consideration to expanding the pool of eligible applicants for the Housing Oversubscription Supplemental Program.

Comment Received: As it relates to the Resilient Home Program: We applaud this program but have two primary concerns: Beneficiaries will be selected from existing waitlists, but there was a great deal of confusion regarding application processing initially.

Staff Response: The Texas General Land Office appreciates the positive feedback contained within this comment and will give adequate consideration regarding the potential confusion resulting from application processing procedures. The Texas General Land Office remains

dedicated to streamlining these types of processes to ensure our impacted Texans have access to recovery funding in the most efficient manner possible.

Comment Received: The Texas General Land Office should ensure that any applicant terminated from the waitlist was not dropped due to no fault of their own. This program excludes homeowners in Houston and Harris County.

Staff Response: The Texas General Land Office remains committed to administering CDBG-MIT funds in the most effective and efficient manner possible. These processes and procedures include eligibility processing that, in some instances, requires a great deal of guidance from the GLO. The Texas General Land Office recognizes this comment and will give it adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: As it relates to the Hazard Mitigation Plan: The Hazard Mitigation Plan must include social vulnerability, at the most local level, in its risk assessment and take into account the impact of past discrimination and disinvestment.

Staff Response: The Texas General Land Office remains committed to utilizing the Social Vulnerability Index as a data source for analysis in risk assessments and other program processes. The content of this comment will be given adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: As it relates to the Resilient Communities Program: We support the inclusion of the development, adoption, and implementation of modern and resilient building codes. The state should reconsider the 'first come first served' prioritization scheme.

Staff Response: The Texas General Land Office recognizes this comment and appreciates the positive feedback. The Texas General Land Office will give the current prioritizations scheme renewed consideration as programs under the CDBG-MIT programs develop.

Comment Received: As it relates to Regional and State Planning: We endorse the state's goal of ensuring that studies in different regions can be consolidated and analyzed. The Action Plan needs to include more information about the state's plan to work with federal agencies to develop mapping and modeling techniques sufficient to conduct a detailed cost-benefit analysis.

Staff Response: The Texas General Land Office recognizes this comment and appreciates the positive feedback. All content of this comment will be given adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: Residential Buyout Programs must be equitable and ensure that LMI families have sufficient resources to move to safer areas. Residential Buyout Programs should focus on community planning and methods to prevent gentrification and

displacement. Residential Buyout Programs should prioritize communities with exposure to environmental and industrial hazards that make the more vulnerable to the consequences of hurricanes and flooding.

Staff Response: The Texas General Land Office is dedicated to ensuring that Residential Buyout Programs utilizing CDBG-MIT funding are conducted in full compliance with applicable law.

Comment Received: The Action Plan should include a presentation of elevation program details and calculations for a variety of areas and conditions to demonstrate that the cap is adequate to elevate homes.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: Steps to minimize the direct and indirect displacement of persons from their homes must be included in the application for a program or project and evaluated as part of the scoring criteria.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: We encourage the GLO to incorporate the following recommendations as they relate to a commitment to using nature-based systems: The 2015 and 2016 Floods State Mitigation Competitions and the Hurricane Harvey State Mitigation Competition should be modified to add incentive points to the scoring criteria to prioritize the implementation of green infrastructure projects that provide multiple benefits to community in addition to the hazard reduction risk.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: All terms should be expanded upon and defined further. The restoration of natural channels of waterways should be prioritized. Emphasis should be placed on the conservation and restoration of the watershed.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: The Texas General Land Office should define and expand Green Infrastructure Incentive for Land Use and Comprehensive Plans. Minimum project amounts should be eliminated. The term 'Project Impact' as scoring criterion needs to be clarified.

Staff Response: The Texas General Land Office, in response to the public comment process, is considering altering the project threshold amount for specific programs. For final threshold amounts, see the Action Plan. All other points presented in this comment will be given adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: As it related to Economic Resilience and Mitigation: CDBG-MIT funds should generate sustainable jobs to be filled with local workers in storm-affected areas. This entails compliance with Section 3 of the Housing and Urban Development Act.

Staff Response: The Texas General Land Office recognizes the content of this comment and will give each point presented adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: The Action Plan must acknowledge the role of climate change in the frequency and severity of natural disasters. Clean energy and energy storage can increase resiliency and improve disaster recovery. Fossil fuel generators are dangerous and vulnerable to fuel shortages, as are internal combustion engine vehicles. Solar panels and electric vehicles are not. Clean energy sources can mitigate water shortages. Air pollution and air quality monitoring should be given consideration under the Action Plan.

Staff Response: GLO, as the primary administrator of CDBG-MIT funds, recognizes the pressing need to ensure communities are recovering, building in resiliency, and working to activity mitigate the risk of impact for future disaster events. Innovative solutions that work to achieve these goals are encouraged and will be given adequate consideration during the application process.

Comment Received: A comprehensive disaster response plan must use social media effectively combating misinformation with timely, accurate, and available information.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: The 'Impacts' section foes not discuss the systematic failure of floating roof tanks during Hurricane Harvey. The Texas General Land Office should determine whether the state's frustration of purpose of EPCRA increases the risk of exposure to hazardous materials after a disaster.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: The Action Plan fails to properly value solar energy and only mentions solar panels as being vulnerable to hail storms.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop.

Comment Received: The Texas General Land Office should consider adding another application requirement for proposals to state how projects will contribute to HUD's LMI goals. The Texas General Land Office should consider funding an effort to update statewide floodplain maps.

Staff Response: The Texas General Land Office recognizes these comments and will give each of the eleven points presented adequate consideration as CDBG-MIT programs and policies progress.

Comment Received: Our subdivision needs an emergency exit as all current exits flood during heavy rains and block residents from leaving. We request the state invest money to pave our roads and maintain and improve our ditches.

Staff Response: The Texas General Land Office recognizes this comment and will give its content adequate consideration as programs under the CDBG-MIT programs develop. The commenter is encouraged to remain locally active as this type of project may be eligible for funding under a CDBG-MIT program.

Comment Received: Our residents pay taxes to Montgomery County, but do not receive the benefit of those tax dollars. The county should adopt King's Colony's roads and ditches. A stormwater detention park is needed to help prevent flooding and provide open recreation space. We request CDBG-MIT funds be used to construct an emergency shelter in our community. We encourage a strong public participation process with Spanish translation provided.

Staff Response: The Texas General Land Office recognizes the content of this comment will give each point presented adequate consideration as CDBG-MIT programs and policies progress.