



## **ANNUAL PROGRESS REPORT GALVESTON COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN**

The Federal Disaster Mitigation Act of 2000 requires all municipalities eligible to receive FEMA grant funding for hazard mitigation projects to adopt a local multi-hazard mitigation plan and update the plan in five year intervals. 44 CFR §201.6 details the criteria which must be addressed in mitigation plans.

Hazard mitigation, a cornerstone of emergency management, is defined as taking sustained actions to reduce or eliminate the long-term risks to people and property from hazards. By taking steps to lower our risk across generations, we can ensure that our community recovers more quickly from natural disasters when they occur. The Galveston County Multi-Jurisdictional Hazard Mitigation Plan as well as the current City of Friendswood Hazard Mitigation Plan identify hazards based on the history of disasters and localized events within the city and lists goals, objectives, strategies and actions for reducing future losses. Hazard mitigation focuses attention and resources on community policies and actions that will produce successive benefits over time. Hazard mitigation also aims to make human development and the natural environment safer and more resilient.

Resolution 2017-11, April 3, 2017, adopted the Galveston County Multi-Jurisdictional Hazard Mitigation Plan (dated February 2017). Resolution 2015-20, September 14, 2015, adopted the City of Friendswood's Hazard Mitigation Plan (2015-2020).

### **2018 PROGRESS REPORT FOR FRIENDSWOOD SPECIFIC ACTION ITEMS**

#### **ACTION ITEM #1**

- **F 2009-2: MITIGATE (ELEVATE, RECONSTRUCT, ACQUISITION, DEMOLITION) REPETITIVE FLOOD CLAIM/SEVERE REPETITIVE LOSS (RFC/SRL) PROPERTIES**
  - This Action Item was carried over from the COF 2003 & 2009 LMP
  - 112 properties participated in the buyout program following TS Allison (2001) and 14 properties participated in the 2013 HMA Grant Assistance Program for elevation with Galveston County.
  - As of the November 2014 RL/SRL listing from TWB, 181 properties remain on the list.
- **STATUS**
  - Following Hurricane Harvey, an application was submitted to the State for mitigation funding to conduct residential buyouts and elevations.

#### **ACTION ITEM #2**

- **F 2009-3: MAINTAIN PUBLIC NOTIFICATION AND WARNING PROGRAMS/SYSTEMS**
  - This Action Item was carried over from the COF 2003 & 2009 LMP
  - The COF disseminates alert warnings as needed through the various media outlets utilized by the city.
  - This item is continually ongoing with programs being maintained.

#### **ACTION ITEM #3**

- **F-2009-4: CONSTRUCT AND EXPAND EVACUATION ROUTES**
  - This Action Item includes the expansion of Friendswood Lakes Blvd. to League City Parkway.
  - Blackhawk Blvd. to FM 2351 and Beamer Road has been pulled out of the Master Thoroughfare Plan in the Spring of 2018.
  - Funding has been established to expand Friendswood Lakes Blvd. between FM 528 and the City of League City limits.

#### **ACTION ITEM #4**

- **F-2009-5: MONITOR WATER SUPPLY AND ESTABLISH CONSERVATION REGULATIONS**
  - Develop regular schedule to monitor drought conditions, report conditions to PW Department and Department Heads
  - Implement the city's Drought Contingency Plan in coordination with Decision Makers & Department Heads
  - This Action Item was carried over from the COF 2009 LMP
  - "Water Wise", a water conservation program promoting conservation in Elementary Schools.
  - Information available on the City's website regarding water conservation.
  - The city continues to monitor the water supply and will update regulations as the need arises.

#### **ACTION ITEM #5**

- **F-2016-1: PURCHASE AND INSTALL WARNING EQUIPMENT WITHIN THE NINE CITY PARKS TO PROVIDE EARLY WARNING OF APPROACHING STORMS (TO INCLUDE TORNADO, WIND STORMS, HAIL STORMS AND LIGHTNING)**
  - This project was designed to provide early warning in all of the 241 acres of city parks.
  - Three parks are located within a floodplain or the floodway.
  - Project was selected as an alternate project by FEMA with funding available.
  - Presented to City Council for approval to proceed and Council denied to pursue the project.

#### **ACTION ITEM #6**

- **F-2016-2: PURCHASE TIGER DAM SYSTEMS**
  - This Action Item was developed to provide an alternate form of protection for the PW facility and equipment.
  - The PW facility is located in the floodway, and elevation of the current office, lunchroom, equipment, fueling station and other outbuildings is not feasible as access to the entire complex is blocked during flood events.
  - These are elongated flexible tubes which are filled with water, can be staked and joined end to end; they can be stacked up to 32" high and linked together seamlessly.
  - These tubes are reusable, so there is a one-time purchase.
  - Water can be drained back into Clear Creek when the flood waters have subsided.
  - Not funded.

#### **ACTION ITEM #7**

- **F-2016-3: RETROFIT PUBLIC WORKS BUILDING AND COMMUNITY SERVICES/PARKS FACILITY TO CURRENT CODES**
  - This Action Item includes properties at 1306 and 1322 Deepwood.
  - Current facility was built in 1978 the building needs to be improved to adhere to current codes.
  - Following Hurricane Harvey, the city is seeking to relocate Public Works operations to a new facility and abandon the Deepwood complex.

#### **ACTION ITEM #8**

- **F-2016-4: PURCHASE AND INSTALLATION OF A BACK-UP NATURAL GAS GENERATOR AT THE ACTIVITY CENTER**
  - The current facility is being utilized as the city's activity for the senior population.
  - The facility currently as a diesel generator and would like to switch to natural gas due to current fuel issues.
  - The Activity Center has been identified as a feeding station for city staff members assigned as essential emergency staff prior to, during and following a severe emergency event.
  - The Activity Center is also capable of providing a source for shelter arrangements for essential emergency staff members.
  - Mitigation application submitted to State, but not selected for funding.

#### **ACTION ITEM #9**

- **F-2016-5: PURCHASE AND INSTALLATION OF BACK-UP NATURAL GAS GENERATOR FOR FRIENDSWOOD ANIMAL CONTROL FACILITY AND FRIENDSWOOD PUBLIC LIBRARY EXPANSION**
  - Expansion of the Library in November 2013 added 21,000 square feet to the existing footprint.
  - Existing generator is not adequate to accommodate the entire expanded facility.
  - Mitigation application submitted to State, but not selected for funding.

#### **ACTION ITEM #10**

- **F-2016-6: INSTALLATION OF A FUEL STATION FOR CITY VEHICLES**
  - Design and install a compartmentalized fuel tank at the PSB at 1600 Whitaker Drive.
  - The tank would contain both diesel and gasoline.
  - Above ground storage tank.
  - Not funded.

#### **ACTION ITEM #11**

- **F-2016-7: PURCHASE A PORTABLE READER BOARD**
  - Portable reader board mounted on a trailer that can be deployed during emergencies and other events within the city.
  - The reader board would convey public information to the public during evacuations & other emergencies.
  - Not funded

#### **ACTION ITEM #12**

- **F-2016-8: ACQUIRE PORTABLE LIGHTING DEVICES TO BE USED AT MAJOR INTERSECTIONS DURING POWER OUTAGES**
  - The project is to purchase 4 portable light towers on trailers to be utilized at the 4 major intersections during extended power outages to protect residents while driving into and/or outside the city.
  - Not funded

#### **ACTION ITEM #13**

- **F-2016-9: UPGRADE DRAINAGE SYSTEMS AND CULVERTS TO ACCOMMODATE INCREASED FLOW**
  - FM 518 Drainage Improvements – Phase 2
  - Annalea/Whitehall/Kings Park Drainage – Drainage Improvements Phase 2
  - Shadowbend Drainage Improvements - Phase 2
  - Sunmeadow Drainage Improvements – Phase 2
  - Tributary 2 Drainage/Outfall Improvements
  - General maintenance continues.
  - No specific projects funded.

#### **ACTION ITEM #14**

- **F-2016-10: MAINTAIN DRAINAGE SYSTEMS AND CULVERTS**
  - Ongoing maintenance continues.

#### **ACTION ITEM #15**

- **F-2016-11: MARY'S CREEK BRIDGE ELEVATION ("DEVILS DIP")**
  - Replace current pedestrian bridge across Mary's Creek connecting 1776 Park to Imperial Estates Section 2.
  - Construct an elevated bridge that will not impede the flow of water and act as a "dam" when debris flows down Mary's Creek.
  - Alleviate and/or eliminate potential flooding of residential properties in Imperial Estates Section 2.
  - An Interlocal program between Galveston County Consolidated Drainage District and the City has been established to construct a low water crossing with box culverts that will include a walking trail.
  - Projected completion is 2021.

#### **ACTION ITEM #16**

- **F-2016-12: BURY POWER LINES**
  - Request that all future developments bury power lines to prevent disruption by protecting lines from wind and flying debris.
  - By requiring future developments to bury power lines, interruption of power can be minimized in more portions of the city.
  - No specific projects funded by city.
  - Currently service laterals are required to be buried for all residential and commercial buildings (from point of service to the building).

#### **ACTION ITEM #17**

- **F-2016-13: ADOPT HIGHER CODES AND UPDATE ORDINANCES AND REGULATIONS TO PROMOTE HAZARD MITIGATION STRATEGIES**
  - The city currently operates under the adopted 2012 IBC to include 3 ASCE-24-10 and the 2012 IFC.
  - 2015 & 2018 IBC and IFC codes area available for review and adoption.
  - Chapter 34 of the City's Ordinances, Chapter 34, Article II – Flood Damage Prevention, was amended September 10, 2018.
  - The 2018 preliminary FEMA flood maps for Galveston County and 2017 FEMA Flood maps for Harris County have been adopted by the city.

#### **ACTION ITEM #18**

- **F-2016-14: UPDATE CITY STORM SURGE MAPS TO REFLECT THE NWS PREDICTIONS**
  - Current maps on the city's GIS system are not updated to correspond with the NWS predictions.
  - The updated maps will display potential storm surge by water depth based upon the NWS predicted storm surge and projected track for landfall.
  - The new maps may more accurately display water depth in areas within the city.
  - Need to have an overlay of the storm surge zone.
  - Not funded

#### **ACTION ITEM #19**

- **F-2016-15: DEVELOP, INITIATE, AND ENHANCE PUBLIC INFORMATION CAMPAIGNS AND AWARENESS PROGRAMS FOR HAZARDS**
  - SEVERE THUNDERSTORM/HAIL/LIGHTNING
    - ✓ Develop public information materials and conduct outreach programs which include information regarding thunderstorms/hail/lightning to include how they develop, precautionary measures to take to protect property and lives, and developing a disaster plan.
  - SEVERE WEATHER EVENTS, HURRICANES, TORNADOES & WIND
    - ✓ Minimize and/or eliminate tree vegetation within local utility ROWs
    - ✓ Develop tornado awareness materials to educate the public as to how to protect themselves and property in the event a tornado would occur in the area.
  - DROUGHT-WATER CONSERVATION
    - ✓ Develop public informational materials to educate the public regarding water conservation measures during periods of drought conditions.
    - ✓ "Water Wise", a water conservation program promoting conservation in Elementary Schools.
    - ✓ Additional conservation strategies are available in the City's "Water Wise" program and is available on the City's website.
  - WINTER STORMS/SEVERE HEAT
    - ✓ Develop public information materials for the general public regarding the location of a warming station at the Public Library.
  - EXPANSIVE SOILS
    - ✓ Educate engineers, public works, and contractors on expansive soil construction techniques such as application of calcium soil stabilizers in high soil rating areas, and installation of property perimeter drainage systems
  - Public Information is distributed throughout the year on an ongoing basis.

#### **ACTION ITEM #20**

- **F-2016-16: PUBLIC INFORMATION AND WARNING MOBILE APPLICATION FOR ANDROID AND APPLE APPLICATIONS**
  - Research and develop a mobile application to be available for citizens to download for IOS and Android operating systems
  - If cost is too prohibitive, research and promote applications already developed to encourage emergency preparedness
  - Promote the use of emergency preparedness apps currently available at the Apple Store.
  - Not funded

#### **ACTION ITEM #21**

- **F-2016-17: DEVELOP A COMPREHENSIVE FLOOD MITIGATION PLAN**
  - Develop a Flood Mitigation Plan for the city and submit the plan to the Texas Water Development Board for guidance and review.
  - Strive to meet criteria necessary to achieve a lower CRS rating through this initiative.
  - Initiate and implement additional floodplain requirements that are above the minimum floodplain compliance.
  - Update the city's current floodplain map to coordinate with the currently proposed FEMA Flood Insurance Rate Map relative to all floodplains as proposed.
  - Chapter 34 of the City's Ordinances, Chapter 34, Article II – Flood Damage Prevention, was amended September 10, 2018.
  - Not funded

### **SUPPLEMENTAL ACTION ITEMS SUBMITTED TO GALVESTON COUNTY FOLLOWING HURRICANE HARVEY**

- **SUPPLEMENTAL ACTION ITEM #1**
- **RELOCATION OF THE PUBLIC WORKS AND PARKS DEPARTMENT COMPLEX**
  - The city is working with FEMA Public Assistance to relocate the Deepwood complex.
  - City is also seeking CDBG funding.
- **SUPPLEMENTAL ACTION ITEM #2**
- **REGIONAL DETENTION ALONG CLEAR CREEK ON THE FOREST BEND HOA PARK SITE**
  - The city is seeking CDBG funding for the installation of this detention pond.
- **SUPPLEMENTAL ACTION ITEM #3**
- **REGIONAL DETENTION AT THE CONFLUENCE OF CLEAR CREEK AND COWARDS CREEK AT THE FORMER SITE OF THE PUBLIC WORKS – PARKS AND RECREATION COMPLEX**
  - The city hired a consultant to evaluate a BCA.
  - The resulting BCA was not high enough to apply for state mitigation funding.
  - Project not funded.
- **SUPPLEMENTAL ACTION ITEM #4**
- **ELEVATION OF LIFT STATIONS**
  - The City is working with FEMA Public Assistance to secure 404 mitigation funds to elevate the essential components of the lift stations damaged by Hurricane Harvey.
- **SUPPLEMENTAL ACTION ITEM #5**
- **ELEVATION OF LIFT STATION #2 (“CRAZY HORSE”) LOCATED AT 1320 DEEPWOOD, IN THE FLOOD PLAIN**
  - The city is working with FEMA Public Assistance to secure 404 mitigation funds to elevate the essential components of the lift station.
- **SUPPLEMENTAL ACTION ITEM #6**
- **COMBINING LIFT STATIONS #1 & #17**
  - The city is seeking CDBG funds through the GLO to complete this project.

- **SUPPLEMENTAL ACTION ITEM #7**
- **MAJOR THOROUGHFARE IMPROVEMENTS AND ELEVATIONS TO ENHANCE EVACUATION ROUTES & MOBILITY**
  - The city will seek CDBG funds to expand evacuation routes.
- **SUPPLEMENTAL ACTION ITEM #8**
- **ELEVATION OF WHISPERING PINES BRIDGE OVER CLEAR CREEK**
  - A BCA for the elevation of the Whispering Pines Bridge is in progress.
  - City is seeking CDBG funding for the elevation.
- **SUPPLEMENTAL ACTION ITEM #9**
- **INSTALL CREEK GAUGES AND FLOOD WARNING SYSTEM**
  - Not funded.
- **SUPPLEMENTAL ACTION ITEM #10**
- **INCREASE SHELTER CAPACITY WITHIN A CITY FACILITY**
  - The city seeks to purchase the "Blackhawk Property" so that a shelter in a city facility will be available on the Harris County side of the city.
- **SUPPLEMENTAL ACTION ITEM #11**
- **ELEVATION & CONSTRUCTION OF A PEDESTRIAN BRIDGE OVER MARY'S CREEK ("DEVIL'S DIP") TO ALLEVIATE FLOODING BY ALLOWING WATER TO FLOW MORE FREELY WITHIN CLEAR CREEK**
  - An Interlocal program between Galveston County Consolidated Drainage District and the City has been established to construct a low water crossing with box culverts that will include a walking trail.
  - Projected completion is 2021.
- **SUPPLEMENTAL ACTION ITEM #12**
- **ELEVATING RESIDENTIAL PROPERTIES TO TWO (2) FEET ABOVE BFE**
  - Application for residential elevations has been submitted for State mitigation funding.
- **SUPPLEMENTAL ACTION ITEM #13**
- **PROPERTY ACQUISITION AND DEMOLITION**
  - Application for acquisitions and demolition has been submitted for mitigation funding.
- **SUPPLEMENTAL ACTION ITEM #14**
- **INSTALLATION OF NATURAL GAS GENERATORS ON PLATFORMS FOR TWO (2) LIFT STATIONS & ONE (1) WATER WELL**
  - Not funded.
  - City will seek mitigation funding.
- **SUPPLEMENTAL ACTION ITEM #15**
- **PROCUREMENT AND INSTALLATION OF BREAK-AWAY SIGN POSTS AND SIGNAGE TO INDICATE FLOOD WATER LEVELS ON STRATEGIC ROADWAYS WHERE FLOODING IS PREVALENT**
  - Not funded.
- **SUPPLEMENTAL ACTION ITEM #16**
- **STORM WATER MODELING**
  - Not funded.
- **SUPPLEMENTAL ACTION ITEM #17**
- **CONVERT WATER WELL #4 TO SURFACE WATER #3**
  - Not funded.

- **SUPPLEMENTAL ACTION ITEM #18**
- **DEMOLITION AND RECONSTRUCTION OF RESIDENTIAL RL/SRL PROPERTIES TO MITIGATE THE CONTINUAL EFFECTS OF FLOOD RELATED OCCURRENCES**
  - Not funded.
  
- **SUPPLEMENTAL ACTION ITEM #19**
- **CONSTRUCTION OF A BERM/LEVEE AROUND LIFT STATION #2 LOCATED AT 1320 DEEPWOOD**
- **CURRENT LIFT STATION IS LOCATED IN THE FLOOD PLAIN**
  - Not funded.
  
- **SUPPLEMENTAL ACTION ITEM #20**
- **BACKUP POWER GENERATOR FOR THE RELOCATED PUBLIC WORKS AND PARKS DEPARTMENT COMPLEX AT THE BLACKHAWK/FM 2351 FACILITY**
  - Not funded.
  
- **SUPPLEMENTAL ACTION ITEM #21**
- **STRUCTURAL DEVELOPMENT & HARDENING FOR A SHELTER OF LAST RESORT & MASS CARE FACILITY**
  - Not funded
  
- **SUPPLEMENTAL ACTION ITEM #22**
- **STRUCTURAL IMPROVEMENTS/RENOVATIONS**
  - Not funded
  
- **SUPPLEMENTAL ACTION ITEM #23**
- **PUBLIC ASSISTANCE FOR THE PURCHASE OF THE BLACKHAWK/FM 2351 FACILITY**
  - The City is working with FEMA PA to develop a project.
  
- **SUPPLEMENTAL ACTION ITEM #24**
- **DETENTION POND AT IMPERIAL ESTATES UTILIZING PREVIOUS BUYOUT PROPERTIES**
  - An Interlocal program between Galveston County Consolidated Drainage District and the City has been established to construct a detention pond.
  - Projected completion is 2021.
  
- **SUPPLEMENTAL ACTION ITEM #25**
- **DETENTION POND AT QUAKER'S LANDING**
  - Not funded.
  
- **SUPPLEMENTAL ACTION ITEM #26**
- **FLOOD PROTECTION FOR FIRE STATION #3**
  - Not funded