



**TX GLO CDBG-MIT PROGRAM  
HURRICANE HARVEY STATE MITIGATION COMPETITION  
51<sup>st</sup> STREET DRAINAGE PROJECT**

**Exiting Conditions:**

The City of Galveston, located on Galveston Island, is the largest community in the United States established on a barrier island. The Gulf of Mexico forms the southern boundary, and Galveston Bay serves as the northern boundary of the city. This geographic location places the city in the top 10% of Texas jurisdictions with a high level of vulnerability to natural hazards as reflected in the GLO Composite Disaster Index (CDI) which ranks the level of community risk from natural hazards. The high CDI index is reflective of the frequent hurricanes, tropical storms, and tidal flooding originating in the Gulf of Mexico. These frequent events often create intense rainfall accompanied by high tides that cause severe flooding of the lower elevations on the island. After the 1900 Hurricane, the eastern portions of the island were raised behind a seawall which was completed in various phases from 1904 to 1961 while areas west of the seawall continue to retain the natural barrier island characteristics.

In addition to storm water run-off, sand is another contributor to the drainage system on Galveston Island. Galveston sand is very fine and easily gets airborne due to the prevailing onshore breeze. This sand is deposited over the areas directly adjacent to the beach side of the island and eventually drains into and gets deposited into the storm sewer system. The sand creates an on-going maintenance concern for the existing drainage system which is described by the city's Drainage Master Plan as begin undersized due to current evaluation criteria requiring a clean and debris free storm sewer infrastructure. As the levels of sand and silt rise during natural events, the capacity of the current system often becomes over-burdened resulting in increased storm water runoff, ponding, and frequent flooding.

Reviews of original construction plans indicate that much of the system was constructed using monolithic box culverts and clay pipe inlet leads. Many of these inlet leads are smaller than 18-inches in diameter which are easily blocked by debris and silt that limit conveyance capacity. Bridge blocks, or small pipes that connect roadside gutters across intersections also contribute to inefficient storm water runoff in the urbanized areas of Galveston. These structures are sometimes square, or small concrete pipes (<15-inch) and generally serve areas where existing storm sewers do not exist.

Runoff in the in the city generally flows from south to north towards the Bay. Elevations in this area range from approximately 1 to 18-feet above sea level. As a result, the 51<sup>st</sup> Street improvement and service areas experience frequent flooding, inundation of storm sewers, and ponding in streets due to the flat topography, inadequate system capacity, and tidal backflow. This frequent flooding also impacts two primary evacuation routes for the island along Broadway and Harborside as well as access to critical community lifelines such as the University of Texas Medical Branch (the county's only Level 1 Trauma unit), Galveston National Laboratory (GNL), and Island Community Center which serves as a transportation HUB for the evacuation of residents during major disasters. In addition, the current capacity of the existing storm drain system is

inadequate to control flooding during minor storms with has resulted in the repetitive flooding of residential neighborhoods and loss of emergency vehicle access to these areas.

### **Proposed Scope:**

The existing storm sewer system will be replaced and upgraded using the City's updated storm drainage criteria that now require a 25-year storm drainage capacity. The storm drainage system and the pump station will be designed such that water from a 100-year storm will be retained on the City's right-of-way. Additionally, the design will provide for at least one lane of emergency vehicle access in the event of a 25-year storm.

The drainage system for this project will be designed to funnel into its own independent network comprising of inlets and large diameter drainage pipes that outflow directly flowing south to north into the bay. The drainage basin acts as a funnel by collecting all the water within the area covered by the basin (hydraulic wall) in underground storm sewer systems and channeling it to a single point.

This project includes the construction of new storm drain systems general vicinity of the area bounded by Stewart Avenue and Harborside Drive; and 59<sup>th</sup> Street and 41<sup>st</sup> Street. The project also includes storm drain connections to the side streets, leads and inlets at appropriate spacing, and restoration of pavement. The improved storm drainage system will be designed to have capacity for a 25-year storm based on Atlas 14, and retain the water from a 100-year storm within the City's right of way. The storm inverts will vary from a depth between 10 and 25 feet.

In addition, the project improvement area includes an outfall pump station on the Galveston Ship Channel end of the proposed storm drain system located at Harborside Dr. and 51st Street. Resiliency measures for the pump station include a finished floor elevation above the 500-year storm and SCADA controls for remote monitoring. The pump station will include an elevated control panel, a below- ground structure, pumps and equipment with sediment traps, a vortex chamber for removing solids, means to use gravity and pumping with weir controls and backflow valves, and a total capacity for the collection system area that reaches from Avenue O to Harborside Drive. The estimated flow for the proposed collection system and pump station is approximately 1,800 cubic feet per second (cfs). The proposed scope of work also includes incidental repairs to roadways as well as water and sanitary lines, which may be damaged during construction.

The design of the proposed systems will be completed in accordance with the City of Galveston smart sheet for capital projects of this nature. Upon completion of this project, the city will have the capacity to effectively control rainwater produced in a 100-year event within the city's right-of-way and eliminate ponding/flooding of private property within the boundaries of the project improvement area. In addition, this project will significantly reduce flooding in project services

area adjacent to the improvement area, prevent flooding on two main evacuation routes, provide critical access to community lifelines, and increase the City of Galveston's resiliency to flooding from future events.

### **Project Location:**

The project includes storm drainage improvements in the general vicinity of the area bounded by Stewart Avenue and Harborside Drive; and 59<sup>th</sup> Street and 41<sup>st</sup> Street. Project improvements also include a pump station at 51<sup>st</sup> Street and Harborside that will help reduce flooding in the project area and the surrounding areas. Improvements in this area will also benefit residents by improving egress during hurricanes and tidal flood events on the city's major evacuation routes along Harborside and Broadway.

Attachment 1: Depicts the area of drainage improvements and service area for the 51st Street Project.

### **Project Budget:**

If awarded, the estimated budget for this project is \$88,808,882.00 which will be funded by the GLO Hurricane Harvey State Mitigation Competition with grant dollars allocated by the U.S. Department of Housing and Urban Development for the CDBG-MIT Program. Of this amount, the city of Galveston will contribute \$1,500,000 in match toward the project.

### **Project Schedule:**

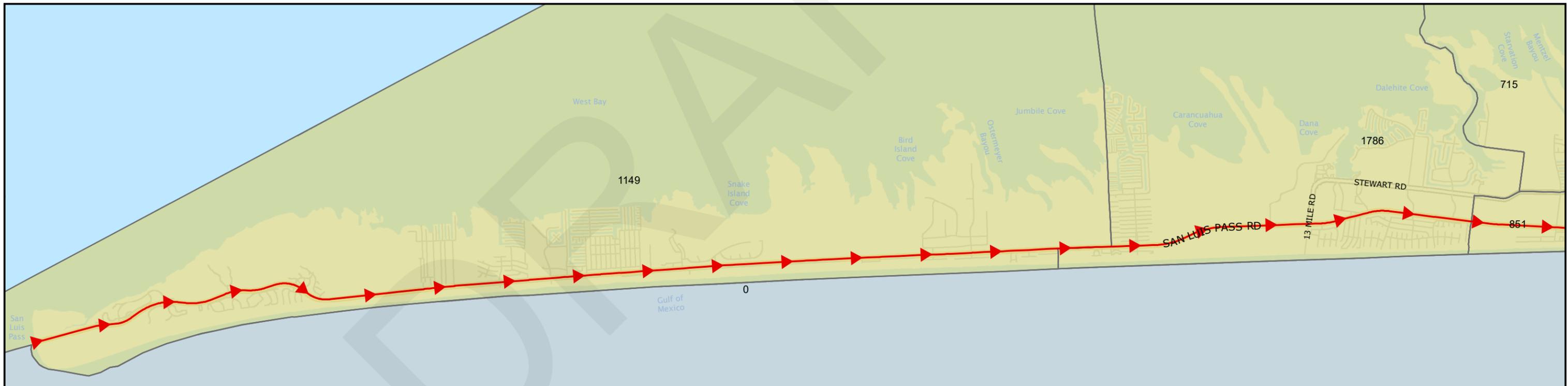
If the City is successful in obtaining the CDBG-MIT grant, the City anticipates starting the Engineering Design in the Spring of 2021. Construction is anticipated to start in early to mid-2022 and the timeline for construction is approximately 3 years.

IN ACCORDANCE WITH THE PROVISIONS OF THE AMERICANS WITH DISABILITIES ACT (ADA), PERSONS IN NEED OF A SPECIAL ACCOMMODATION TO PARTICIPATE IN THE PUBLIC COMMENT PROCESS SHOULD CONTACT THE CITY SECRETARY'S OFFICE, SUITE 201, 823 ROSENBERG, GALVESTON, TEXAS 77550 (409-797-3510).



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**ATTACHMENT 1**  
**51st Street Drainage Project**  
**Project Improvement and Service Area Map**



# CDBG-MIT 51st Street Drainage Project Service Area Map

**Printed on:** 09/29/2020  
**By:** City of Galveston  
 Information Technology Department

**Source Credits:**  
 City of Galveston, USGS, et al. - Basemap; Galveston Central Appraisal District (GCAD) - Street Centerlines; Census Bureau - 2010 Galveston County Block Groups (t\_2010\_48167\_bg\_10) and DECENNIALSF12010.P1\_data\_with\_overlays table; City of Galveston - Evacuation Routes, Community Lifelines; UTMB, GNL, Community Center (GCAD parcel-based), & Area of Drainage Improvements; Houston-Galveston Area Council - Airport

**Coordinate System:** NAD 1983 StatePlane  
 Texas South Central FIPS 4204 Feet  
**Units:** Foot US

1 in = 5,000 feet

0 5,000 Feet

- Legend**
- 51st Street Drainage Project Service Area: 47,669 Beneficiaries
  - 51st Street Drainage Project Service Area: Partial Block Group
  - 2010 Census Block Groups\*
  - Evacuation Routes
  - 51st Street Drainage Project: Area of Drainage Improvements
- \*Numbers in the 2010 Census Block Groups polygons represent P1 - Total Population for each Census Block Group (see Source Credits for Census file information)

- Community Lifelines**
- Galveston National Laboratory
  - University of Texas Medical Branch (UTMB) Facilities
  - Island Community Center
  - Scholes Airport

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