

# ALABAMA STATE EXPENDITURE PLAN (SEP)

## Project #15: Mobile Area Storm Water Mapping & Resiliency Planning

### Project Description/Summary

a) This planning project proposes to: 1) Complete a GPS digital inventory and GIS database and map of storm water infrastructure that flow through the City of Mobile into Mobile Bay; 2) Identify properties within the City of Mobile subject to repetitive flood loss and develop a strategy to address and effectively remedy prospective losses; and 3) Obtain information and data to assist with the update of the City of Mobile's outdated Flood Plain Management Plan, last revised in 1984. These efforts will allow the City to locate and map storm water infrastructure throughout the City of Mobile to develop an effective strategy to mitigate repetitive loss.

As a coastal community, the City of Mobile experiences periodic coastal and riverine flooding, including storm surges from hurricanes and flash floods. From 1973 to 2014, Mobile County was included in forty-six federal disaster declarations due to flooding. These severe weather events not only threaten lives and private property, but damage public infrastructure such as overstressed or poorly designed storm water systems.

Underperforming storm water drainage systems hamper the implementation of effective flood control measures that would reduce risk and improve the capacity to recover and adapt to severe coastal weather events. Mobile area storm water networks are also tidally-influenced due to numerous outflows to Mobile Bay; therefore, the City is particularly vulnerable to the effects of changing ocean conditions and storm surge.

Activities also include the comprehensive administration of this grant, including, but not limited to, project development and oversight, contracting, and sub-recipient monitoring.

- a. **Need:** There is a great deal that is unknown about the City's storm water network. Parts of the system are over 100 years old. It is not uncommon to find wood culverts and structures – still functioning – under the streets of downtown. The system components in the older sections of the City were constructed well before modern standards and, as a result, have needed numerous repairs over time. In some areas, this has resulted in an amalgamation of mismatched materials decreasing the system's efficacy over time.

Because accurate information about existing storm water infrastructure is currently either lacking or difficult to access, many City staff hours are spent in the field surveying and verifying the location and flow direction of storm water systems for development design reviews and permits. The City of Mobile estimates that as much as 20% of City Engineering Department staff time is spent on such field investigation activities. The City's Public Works and Planning Departments staff are similarly burdened. The costs of maintenance and construction contracts, as well as private-sector

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development planning, are also significantly increased due to a lack of reliable as-built drawings and accurate and complete digital map data.

**Purpose:** The project's purpose is to develop the information and tools necessary to successfully plan and cost-effectively manage communities and economies in the Mobile region that are resilient in the face of flooding, extreme weather events, climate hazards, and changing ocean conditions.

**Objective:** The primary objectives for this project include:

- Complete a GPS digital inventory and GIS database and map of storm water infrastructure that flow through the City of Mobile into Mobile Bay.
  - Identify properties within the City of Mobile subject to repetitive flood loss and develop a strategy to address and effectively remedy prospective losses.
  - Obtain information and data to assist with the update of the City of Mobile's outdated Flood Plain Management Plan, last revised in 1984.
- b. This activity is located in the Gulf Coast region and will be carried out in the City of Mobile in Mobile County, Alabama.
- c. This project is anticipated to begin on 7/1/19 and end on 6/30/22 (3 years).
- d. This project will be implemented by the City of Mobile.
- b) This project will positively impact communities throughout the City of Mobile. It will increase community resiliency by identifying areas most vulnerable to repeated flood events and executing an adaptation strategy for reducing the potentially catastrophic economic and social impacts of such events. Additionally, it will explore the possibility of entering into FEMA's National Flood Insurance Program (NFIP) Community Rating System (CRS) and reduce flood insurance premium rates by 5% to 45% in vulnerable communities.

### Eligibility and Statutory Requirements

This activity is located in the Gulf Coast Region and is eligible for Spill Impact Component funding under Category #8 – Planning Assistance (primary).

### Comprehensive Plan Goals and Objectives

This project is consistent with the following Comprehensive Plan goals:

- Goal 4: Enhance Community Resilience – Build upon and sustain communities with capacity to adapt to short- and long-term changes; and
- Goal 5: Restore and Revitalize the Gulf Economy – Enhance the sustainability and resiliency of the Gulf economy.

This project supports the following Comprehensive Plan objectives:

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- Objective 5: Promote Community Resilience – Build and sustain Gulf Coast communities’ capacity to adapt to short- and long-term natural and man-made hazards, particularly increased flood risks associated with sea-level rise and environmental stressors. Promote ecosystem restoration that enhances community resilience through the re-establishment of non-structural, natural buffers against storms and flooding.

### Major Milestones

- a) Milestone 1: Complete GIS mapping
- b) Milestone 2: Complete identification of flood loss properties
- c) Milestone 3: Complete final plan

### Success Criteria/Metrics/Outcomes

The anticipated outcome of the Mobile Area Storm Water Mapping and Resiliency Planning project will be:

- The development of a plan which delineates storm water infrastructure throughout the City and identifies repetitive flood loss properties

**Table 16. Proposed Projects Success Criteria/Metrics/Outcomes**

Activity	Anticipated Project Success Criteria/Metrics	Short-term outcome	Long-term outcome
Develop a plan which delineates storm water infrastructure throughout the City and identifies repetitive flood loss properties	Compete GIS mapping  Complete identification of repetitive flood loss properties  Complete one Storm Water Mapping Plan	More efficient inspections  More effective management and maintenance	Greater coastal resiliency

### Monitoring and Evaluation

- a) Submit results of bid process to ADCNR prior to awarding contracts
- b) Submission of completed Plan to ADCNR
- c) Submission of quarterly and final reports

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## Best Available Science

The Repetitive Flood Loss Strategy and updated Storm Water Management Guidance Manual will be modeled after modern, successful similar documents. The City, along with its consultants, will perform literature searches and coordinate with other government entities to determine best practices.

The inventory and database scope will be performed by a contractor. The anticipated procurement method for the consultant contract(s) is competitive proposals. The City will issue a Request for Qualifications. Interested consultants will be required to provide a general project methodology and describe experience with similar projects. Through independent technical review of the responses, a consultant will be selected, or a shortlist will be developed, and interviews will be conducted. Upon selection of the consultant, a scope of work that maximizes the quality, objectivity, and integrity of the information collected will be developed. The scope of work will be developed in tandem with the consultant and the City of Mobile's long-term planning, land use/zoning technicians, engineering and GIS departments.

It is anticipated the scope for the contract will consist of data collection and data processing (including quality control). Once the data has been accepted by the GIS department, data management will be performed by the City. Additional details for each scope item are provided below.

### Data Collection

The surveyor's inventory will include rim elevation, depth, invert elevation(s), material, pipe diameter(s) and condition with an approximate horizontal accuracy of + 0.1 feet and vertical accuracy of + 0.2 feet. A copy of the City of Mobile's existing storm water database will be provided to the surveyor in an ESRI ArcGIS 10.3 file geodatabase format. Field collected data will be uploaded into the provided file geodatabase by the surveyor in the appropriate layers with corresponding attributes and measurements. Layers will include complete and accurate metadata in the North American Profile of ISO 19115 Geographic information - Metadata format as an eXtensible Markup Language (XML) file. Deliverables will be delivered in the Alabama State Plane Coordinate System (West Zone), referenced to NAD83 2007, and expressed in U.S. Survey feet. Vertical control will be referenced to NAVD88 Geoid12A.

### Data Processing

The deliverable will be put through a quality assurance process by the City of Mobile's GIS staff for acceptance. Accuracy, feature attributes, and metadata will be validated in ESRI's ArcGIS 10.3 Desktop. Any features that fail the review process will be documented and tracked in the City's geodatabase using coded domains for pre-defined QA/QC data calls along with the reviewer's comments. The data calls will be sent to the surveyor in an ArcGIS 10.3 file geodatabase to be used in the correction and redelivery of the data. Revisions will be redelivered for a repeat of the quality assurance process.

Once accepted, the GIS staff will import the data into the City of Mobile's storm water database. Once imported, the new data will be GIS processed with the GIS staff

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connecting the new data to features in other storm water related layers (e.g., gravity mains, laterals, outfalls, ditches, streams, flood control structures). Pipes, ditches, and streams will be digitized in the direction that the water flows. A connectivity network will be developed with valid topology.

City of Mobile GIS Department staff will further utilize the updated storm water network along with the hydro-flattened bare-earth surface DEM based on the 2014 countywide QL2 LiDAR to delineate drainage areas for each outfall.

### Data Management

**Data Storage and Security:** Since 2000, all of the City's GIS data has been centrally located in a GIS database using ESRI's SDE and ArcGIS Server. The GIS Manager administers the City's storm water GIS database with ESRI's ArcGIS Server 10.1 in a Microsoft SQL Server 2012 database running on a VMware virtual machine on a VMware ESXi 5.0 on-site host server which is also administered by the GIS Manager. The VMware host server is connected to a SAN with 2TB of dedicated space that is in a separate City facility than the host server. The SAN is also mirrored to another City facility for fail over. The database server is cloned (copied) to the SAN weekly. In addition, the database is backed up to a removable tape every night with a tape archived weekly to an off-site location and quarterly to a safety deposit box in a bank vault. GIS database security is administered by the GIS Manager using Microsoft's SQL Server database security. At this time, only designated GIS staff members would have edit privileges in ArcGIS Desktop with all other users in the Engineering, Public Works, and Planning and Development Departments having read only.

**Data Maintenance:** The City of Mobile will maintain those portions of the storm water GIS database within its corporate limits beyond the three-year project period. The storm water data will become a significant part of the City's geodatabase and will be maintained as long as the City's GIS exists. City departments including the Engineering and Public Works Departments will require accurate digital as-built drawings of storm water features from new construction projects in the street right-of-ways or city facilities including all appropriate attributes and measurements required by the storm water database. In addition, the City will continue to fund and coordinate countywide basemap projects for high resolution color orthophotography and surface topography datasets that support mapping of natural and manmade hydrography features and outfall drainage delineation.

### Budget/Funding

- a) Estimated cost of the project and amount to be requested from Spill Impact Component Funds: \$3,090,000 (100% - Planning). While it is noted that funding available under a grant award cannot exceed the amount described in the SEP for this project, the percentages listed in this section are estimated and will be more clearly cultivated in the grant application.
- b) No other funding sources are anticipated at this time.

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Partnerships/Collaboration (if applicable) Not applicable at this time.

Leveraged Resources (if applicable) Not applicable at this time.

Funds Used As Non-Federal Match (if applicable) Not applicable at this time.

Other  
Not applicable at this time.



Figure 15. The Mobile Area Storm Water Mapping & Resiliency Planning project will be implemented in the City of Mobile, Alabama.