

# RESILIENT PASCO

## Vulnerability Assessment and Sustainability & Resiliency Plan

### Draft Scope of Work

#### INTRODUCTION

This proposed scope of work has two major phases that address community lifelines from a vulnerability, sustainability and resiliency perspective. Phase A is the Vulnerability Assessment. Phase B is the Sustainability & Resiliency Plan.

Community lifelines are fundamental services (aka assets) that are required for a stabilized society. Lifelines enable the continuous operation of critical government and business functions. They are essential to human health and safety or economic security. Pasco County has identified eight (8) community lifeline focus areas to be reviewed as part of this study. These include: safety and security, medical and health, food and shelter, transportation, water supply, wastewater, stormwater, and energy.

#### COMMUNITY LIFELINES

##### Safety & Security

- Law Enforcement
- Fire Services
- Government Services
- Community Safety

##### Stormwater

- Major outfalls and discharge structures

##### Food and Shelter

- Food
- Shelter
- Agriculture

##### Health and Medical

- Medical Care
- Public Health
- Patient Movement/Transport
- Medical Supply Chain
- Facility Management

##### Water Supply

- Primary water main line files
- The model grid resolutions are shown as ranges since because the model will make use of a non-uniform grid, not a uniform grid made up of equal sized cells.
- Wellhead points
- Water treatment plant building footprints
- Pump station building footprints
- Water tower points

##### Transportation

- Road centerlines
- Rail centerlines
- Road and rail bridge deck polygons
- Airport building footprints
- Airport runway polygons
- Bridges
- Traffic control boxes/cabinets/ITS systems
- Mass Transit
- Maritime (marinas, ferries, boat ramps)

##### Wastewater

- Transmission line files (all sizes)
- Treatment facility buildings and equipment
- Lift stations
- Pump stations
- Surface water discharge outfalls

##### Energy

###### *Natural gas*

- Trunk pipeline line files
- Compressor station building footprints
- Liquefied natural gas storage points
- City gate points

###### *Electricity*

- High voltage powerline line files
- Substation points
- Transformer points
- Power plant building footprints
- Solar fields

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

**Draft** Scope of Work

#### OVERALL PROPOSED PROGRAM BREAKDOWN

##### PHASE A – VULNERABILITY ASSESSMENT

PHASE A is development of a county-wide vulnerability assessment to identify at-risk and critical infrastructure subject to flooding, coastal storm surge, sea level rise and inundation threats, as well as identification of potential adaptive and mitigative strategies. Project benefits include:

- Data collection on vulnerable assets and community lifeline impacts, valuable for future phases and overall, long term planning.
- The restoration and protection of natural resources that provide important buffers to help protect coastal infrastructure, properties, and other community lifeline assets.
- The mitigation of damage to fish, wildlife and natural resources as a side benefit of adaptive or mitigative strategies. that enhance of natural resources to help protect coastal infrastructure.
- A more resilient community leads to less financial risk for companies to invest in the area and do business here. This supports investment in workforce development and job creation. In addition, some of the mitigation activities themselves will provide job creation.
- A more resilient transportation system which will benefit both the community and achieve a more sustainable tourist economy resulting in job creation and added benefits to the regional economy.

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##### PHASE B – Sustainability & Resiliency Plan

PHASE B is development of a county-wide resiliency plan, through a collaborative process, in unison with county staff and communities as a strategic action and guidance plan. Project objectives are:

- Position the County stakeholders to have a greater understanding of their sustainability and resiliency challenges and opportunities related to existing vulnerabilities and future conditions outlined in existing studies and best-available data;
- Examine the gaps and synergies between existing County programs, policies, and projects;
- Integrate practices, policies, and procedures into the overall operations and functioning of the County and its priorities (e.g., capital expenditures, performance measures, CIP project ranking, budgetary decision packages, procurement, internal appropriations, operations, and maintenance, etc.);
- Outline methodologies and/or develop tools to evaluate fiscal, economic, societal, and environmental impacts and return on investments;
- Support the County's Sustainability & Resiliency Project with guidance for implementing the Plan goals and measures; and,
- Provide the County with recommendations and strategies on how to best implement a holistic and comprehensive sustainability and resiliency plan that ensures successful internal action with external benefits.

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

## SCOPE OF WORK

### A. PHASE A: VULNERABILITY ASSESSMENT

The primary purpose of the project is to identify at-risk and critical infrastructure subject to flooding, coastal storm surge, and inundation threats, as well as potential adaptive and mitigative strategies.

The project will enhance community resilience and build and revitalize the Gulf economy. The project will enhance community resilience by identifying vulnerable coastal infrastructure assets to coastal flooding, storm surge and sea level rise and by formulating adaptation/mitigation strategies to better protect those assets. Importantly, a more resilient community leads to a more sustainable and robust local economy. A less resilient community adds economic risk that will make it more difficult to attract and retain target industries and the higher-wage employers essential to a healthy economy.

- It is anticipated that the adaptation/mitigation strategies derived from the project will consider utilization of the natural environment as a buffer to protect vulnerable infrastructure. That utilization will likely include restoration and conservation of habitat which leads to the restoration of water quality and the replenishment and protection of living coastal and marine resources, as all three of these environmental-related goals are intertwined. In addition, the enhanced resilience of coastal infrastructure will lead to more efficient stormwater systems that will help restore water quality and positively impact the other related environmental goals. The identification of stormwater improvements or retrofits may result from this project.
- This project is intended to identify at-risk assets as well as selected adaptation/mitigation strategies that should make those asset-types more resilient to a changing environments. Essential elements of the project include ongoing participation and collaboration in the regional climate science and planning initiatives underway, as well as strategic public engagement to inform citizens, business community, etc. of the project purpose and solicit targeted input along the way. A key goal of the project is to generate collaborative and ongoing momentum for countywide resiliency planning, including arriving at a common understanding and agreement on critical infrastructure vulnerabilities.
- The planned economic analysis of the project will facilitate long-term/sustainability and cost-benefit-driven decision-making and prioritization by local governments, including the opportunity to identify key projects that may be eligible for infrastructure sales tax funding. The project will broadly assess the economic impact of certain infrastructure losses and scenarios in order to better plan and prioritize resiliency, mitigation and adaptation investments. The project will also provide the means to better facilitate the allocation of finite capital over time to the key infrastructure needed to sustain (both economically and environmentally) the Pasco community, using a systems method of planning and analysis. The project will support better understanding of the connection between infrastructure resiliency and economic development, helping to facilitate policy development and the prioritization of certain public investments, including the identification of key resiliency projects that could be funded by a Penny for Pasco extension.

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

- A key goal of the project is to better facilitate decision-making and the allocation of finite capital to the key infrastructure needed to support a more climate resilient Pasco community, using a systems method of planning and analysis that can be applied to annual capital improvement planning and programming.

The project will implement components of the County's post-disaster redevelopment plan (PDRP). The PDRP both acknowledges and recognizes the need to plan for coastal resiliency and sea level rise. The PDRP includes a Vulnerability Analysis chapter that discusses the hazards to which Pasco County is vulnerable and the factors that make us more vulnerable to the impacts of these hazards. The PDRP Vulnerability Analysis chapter reveals Pasco's post-disaster redevelopment needs, our areas of concerns and potential obstacles to a successful recovery. The term 'vulnerability' is defined from different perspectives, though all within the context of long-term redevelopment. It looks at various factors that might either make us more susceptible to the impacts of disaster and/or limit our capacity to quickly and successfully recover from it. Aspects considered in the analysis include:

- Demographics
- Socio-economic factors
- Built-form characteristics; and
- Spatial distribution.

#### PDRP Action Strategies

The PDRP includes the following relevant vulnerability and resiliency Action Strategies:

- **Action A2.3.3:** Amend the Coastal Management Element of Pasco County's Comprehensive Plan to reflect the development and redevelopment requirements that are mandated by the 2015 amendments to Chapter 2015-69, s. 163.3177, FS (6)(g), in relation to Sea Level Rise.
- **Action A3.1.2:** When preparing or reviewing redevelopment plans, include an analysis of hazard vulnerability when considering appropriate locations for increased densities and intensities.
- **Action A3.1.3:** Post flooding events, using damage assessment and geospatial analysis, identify areas that have been repeatedly flooded or are significantly impacted by recent floods. Evaluate them for designation as "adaptation action areas" or for implementation of appropriate sea level rise adaptation strategies to ensure long-term mitigation.
- **Action A3.1.4:** Conduct vulnerability analysis, identify places and systems that might potentially be impacted by sea level rise, and assess sea level rise scenarios using methods and tools such as: analysis of storm surge zones, the Sea Level Affecting Marshes Model (SLAMM) and the HAZUS model for Storm Surge.
- **Action A3.1.5:** Incorporate adaptation strategies into the planning and design of redevelopment catalyst sites within the Harbors – West Market Redevelopment Area. Wherever possible, integrate adaptation strategies, into the planning, design and redevelopment of catalyst sites.
- **STRATEGY A2.3:** Consider non-structural growth management tools and strategies, and any appropriate changes to Future Land Use policies and Land Development Regulations to reduce the vulnerability of development to natural disasters.
- **Action D1.7.2:** Think about long-term economic redevelopment in terms of vulnerability, future resiliency, and vision.
- **Action E5.1.3:** Conduct and distribute the vulnerability analysis of facilities serving the homeless population including food pantries, soup kitchens, shelters, centers and agencies.
- **Action E7.1.1:** Develop an inventory of all child-care facilities and determine the vulnerability to natural hazards.

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

- **Action F1.1.1:** Review vulnerability assessments of public facilities and alternate facilities to determine the potential of using these alternative facilities for an extended period of time.
- **Action G1.1.1:** Consolidate and/or complete a comprehensive inventory and vulnerability assessment of County infrastructure (transportation, surface water management, utilities and public buildings) to use as a basis for prioritizing mitigation, relocation or replacement projects in both the pre- and post-disaster environment. Include life cycle analysis as a part of the assessment.
- **Action G1.1.7:** Using vulnerability information, capital improvement plans, local mitigation strategy information, cost-benefit and life-cycle analysis, etc., determine which impacted facilities should undergo short term temporary/immediate repairs versus long term adaptive reconstruction.
- **Action G3.1.1:** Identify and maintain information on vulnerability of sewer, septic and drainage system to overflows, etc., from storm surge, flooding, etc., and prioritize for mitigation or relocation, as feasible.

Since the areas between U.S. 19 Highway and the Little Road corridor are so densely populated, sea level rise alone or in combination with the effects of coastal erosion, could critically tax evacuation, re-entry and recovery efforts. In order to ensure the availability of alternate evacuation routes, the County through its Capital Improvement Plan, Comprehensive Plan and the Land Development Code, needs to plan and implement a robust transportation network. The Comprehensive Plan Policy FLU 1.1.5 (Transportation Corridor Management), the Land Development Code Section 901.1 (Transportation - Corridor Spacing) and Section 901.2 (Transportation - Corridor Management), and the County's Metropolitan Planning Agency's long-range transportation efforts will be critical in achieving this goal.

In addition to implementing an interconnected roadway network, the County has taken steps to retrofit neighborhoods where localized flooding has caused the need for disaster response activities. Examples include, the purchase of two unused golf courses in the Magnolia Valley and Timber Oaks communities to improve drainage conditions. Projects of these types underscore the need to begin long-term recovery and redevelopment efforts long before an actual disaster.

- The project will assist in implementation of several policies in **Pasco 2025 Comprehensive Plan** that are either directly or indirectly related to post-disaster recovery or redevelopment. Some of the aspects covered by the Comprehensive Plan that are crucial to vulnerable assets and post disaster planning are:
  - a. Protection of environmentally sensitive lands
  - b. Natural resource protection
  - c. Protection of floodplains
  - d. Restricting or regulating development within coastal high hazard areas
  - e. Post-disaster relocation of housing
  - f. Minimum construction standards for housing to minimize damage by floods
  - g. Protection of historical and cultural resources

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

A significant portion of the **Pasco 2025 Comprehensive Plan** focuses on diverting away development and infrastructure from areas that are environmentally sensitive, and from areas with high hazard vulnerabilities. Although the majority of these policies are centered on mitigation, Pasco County's Comprehensive Plan provides a broad framework for establishing more detailed policies for post-disaster rebuilding and redevelopment. It provides guidelines or policies that encourage economic development, job creation, infrastructure improvement, protection of the ecosystem, and prevention of landform alteration, all of which fully support post-disaster redevelopment goals.

Another critical aspect of Pasco County's Comprehensive Plan is how it addresses the issue of "Sea Level Rise." Although it doesn't specifically mention sea level rise, it includes policies that complement and support adaptation to rising sea levels. These policies are listed within the Coastal Management Element of the Comprehensive Plan and primarily employ a 'protection' or 'avoidance' based approach for addressing the issue of sea level rise.

Comprehensive Plan includes policies aim to protect natural vegetation and habitats that act as buffers and help mitigate the impacts of current and future flooding, and rising sea level. It promotes the maintenance of beach dune systems and the restoration of adversely altered systems through beach stabilization measures, as recommended by the Florida Department of Environmental Protection. It also highlights relevant plans and programs such as the County's Parks Master Plan, Land Development Code regulations, and the Capital Improvements Plan, that will be critical in supporting this goal.

The County's Comprehensive Plan also includes avoidance-based sea level rise adaptation strategies that focus on restricting density, redirecting populations, and limiting infrastructure investments in the Coastal High-Hazard Areas. Most of these policies are focused on either protecting existing development, or guiding new development away from areas that are highly vulnerable to coastal flooding and sea level rise.

- **The Harbors West Market Area Redevelopment/Infill Plan** includes the following strategies:
  - Incorporate integrative adaptation strategies within the Harbors implementation projects that address mitigation for coastal and inland flooding, storm surge, sea level rise, and related impacts. Evaluate redevelopment projects or initiatives to identify the type(s) of adaptation strategy (protection, accommodation, strategic relocation, avoidance and procedural) that could be employed.
  - Assess all critical infrastructures to determine their current vulnerability to different types of disasters.
  
- The **2019 Pasco County Local Mitigation Strategy (LMS)**, sea level rise is recognized as an emerging hazard warranting attention in the LMS. This project will help facilitate this next step.

This project is timely for the following reasons: current average global temperatures, based on current science, are warmer by about +0.8 degrees Celsius compared to 100 years ago. The 2014 United States National Climate Assessment (NCA) and the Intergovernmental Panel on Climate Change (IPCC) report of 2013-2014 forecasts accelerating global warming with increases of +2 to +5 degrees Celsius by 2100. As

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

a result of warming global temperatures, global sea levels are rising. This rise is anticipated to accelerate in the future due to two factors:

- warmer global temperatures will result a higher rate of ice melt for mountain snow caps, glaciers and land ice in Greenland and Antarctica; and
- warmer global temperatures will result in the thermal expansion of the world's oceans.

Local data measured at the St. Petersburg tide gauge station (Station ID 8726520), which is the closest tide gauge station to Pasco County, shows that sea levels in Tampa Bay have already increased approximately 6.6 inches since 1947, when water levels were first recorded at this tide gauge. This rate of change (approximately 2.54 mm/year or 10 inches per 100 years) has accelerated in recent decades. Recent reports indicate that not only will global mean sea level (MSL) continue to rise during the 21st century, but that rate of increase is likely to accelerate due to additional ocean warming and the loss of land-based glaciers and ice sheets.

Pasco County's ties to the water are extensive. Because of its large geographic size and location on the Gulf of Mexico, the massive Green Swamp, location of Tampa Bay Water reservoirs the Anclote, Pithlachascotee, Withlacoochee and Hillsborough Rivers, and over 122 acres of waterbodies, no areas within its boundaries are more than just a few miles from either the Gulf coastline, a wetland or riverine system.

Unfortunately, Pasco County and the Cities of New Port Richey and Port Richey have numerous coastal infrastructure assets that serve the public and these facilities may be vulnerable to rising sea levels. This project is important as it will identify these assets as well as adaptation/mitigation strategies that will make the County more resilient, physically and economically, to a changing environment.

Essential elements of the project include building upon previous resiliency planning work performed in the region, eventually facilitating the systematic incorporation of climate risk and resiliency information into local and countywide infrastructure planning and investment processes. Specifically, this project will involve, among several tasks, the creation of a Geographic Information System (GIS) that utilizes an agreed-upon sea level rise projection methodology for various time scales and scenarios, the latest topographic data (DEM/LiDAR) and the location of existing and planned transportation, utilities and public safety infrastructure in Pasco County [i.e., for the unincorporated county, municipal data and relevant infrastructure data from other stakeholders (e.g., FDOT, Tampa Bay Network to End Hunger (food banks/feeding sites))]. This GIS-based decision support tool will be used to generate scenarios related to timelines and change, and facilitate assessment of realistic adaptation and mitigation strategies. Additionally, the planned economic analysis will facilitate long-term/sustainability and cost-benefit-driven decision-making and prioritization by local governments, including the opportunity to identify key projects that may be eligible for infrastructure sales tax funding. More specifically, Key goals of the project include:

- To generate collaborative and ongoing momentum for countywide resiliency planning, including arriving at a common understanding and agreement on critical infrastructure vulnerabilities.
- To build on the post-disaster redevelopment planning work done to date and begin to link sea level and climate planning to the Local Mitigation Strategy.

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

- To broadly assess the economic impact of certain infrastructure losses and scenarios in order to better plan and prioritize resiliency, mitigation and adaptation investments.
- To enhance the countywide GIS network(s) and database, supporting resiliency and infrastructure planning.
- To better facilitate the allocation of finite capital over time to the key infrastructure needed to sustain (both economically and environmentally) the Pasco community, using a systems method of planning and analysis.
- To facilitate the identification of adaptation strategies for incorporation into the MPO's 2045 Long Range Transportation Plan.
- To support better understanding of the connection between infrastructure resiliency and economic development, helping to facilitate policy development and the prioritization of certain public investments, including the identification of key resiliency projects that could be funded by a Penny for Pasco extension.

The PHASE A, Vulnerability Assessment Scope of Work will be phased as follows:

#### **Task A.1 - VULNERABILITY ASSESSMENT PROJECT KICKOFF** [estimated 3-month duration]

The objective of this Phase is to initiate the project and on-board the consultant, as well as confirm the project goals and objectives. Key tasks include:

**A.1.1:** Release Request for Proposals; retain technical consultant services; convene lead project team and identify key collaborators/subject matter experts

**A.1.2:** Confirm project goals and objectives with project partners and identify/establish planning teams(s)

#### **Task A.2 – DATA COLLECTION AND ANALYSIS (countywide)** [estimated 9 month duration]

The objective of this phase of the project is to identify and synthesize existing sea level rise data, studies, and findings relevant to this project and as necessary, to generate supplementary data to facilitate the assessment of vulnerabilities. The Consultant will work with the lead team to perform the following tasks:

**A.2.1:** Determine climate and sea level data/methodology to be used.

**A.2.2:** Identify other relevant data (topographic, environmental, etc.); identify data gaps.

**A.2.3:** Collect/assess/verify asset inventory (at a minimum, transportation, utilities and stormwater); includes relevant infrastructure data from county, municipal as well as non-municipal and county providers.

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

**A.2.4:** Acquire/Format/Assess Data. Initiate GIS database enhancement design and development. The Consultant will work with the lead team, project partners and stakeholders to obtain the best available, regionally scaled transportation, utilities, stormwater, climate data, Flood Insurance Rate Maps (FIRMs), and topographic data (LiDAR/DEMs) from local, regional, state, and national agencies, etc. This task will leverage previous work performed by and/or relevant to Pasco County, including the FDOT's Sketch Planning Tool, Local Mitigation Strategy (LMS), watershed plans, Pasco Post Disaster Recovery Plan, Pasco 2025 Comprehensive Plan, etc. Data collection, analysis and outreach are primary elements of this task. The TBRPC GIS resiliency and Tampa Bay Network to End Hunger database layers and any relevant local government GIS database layers will be utilized. Existing and planned infrastructure networks/layers will be collected and integrated into the GIS geodatabase. The focus of the infrastructure data collection will be facilities of countywide significance, but all readily available data will be integrated if relevant. Existing data on sea level rise and inland flooding will be collected. The best available LiDAR/Digital Elevation Model(s) will be used/integrated into the GIS geodatabase to facilitate the asset exposure analysis. Data and information gaps will be assessed. Other environmental data which may impact infrastructure vulnerability assessment or identification of mitigation and adaptation strategies will be identified for inclusion in the analysis. Additional or updated climate data from the Tampa Bay Climate Science Advisory Panel (CSAP) is likely to include scenarios of sea level rise, developed based on specific analysis years and impact thresholds required for infrastructure vulnerability analysis. Available plans and studies that are relevant to the analysis will also be identified at this time (e.g., Long Range Transportation Plan, Local Mitigation Strategy, Watershed Plans, Post Disaster Redevelopment Plan, 2025 Pasco County Comprehensive Plan, etc.)

#### **Task A.3 – VULNERABILITY and RISK ASSESSMENT** [estimated 9 month duration]

The objective of this Phase is to verify critical infrastructure and identify at-risk critical infrastructure for further analysis. Once the infrastructure subsets are identified, detailed analysis will be undertaken to better assess specific vulnerabilities, to refine data, verify assumptions and findings, and begin to test scenarios and strategies. For the critical infrastructure assets identified for detailed analysis, the potential fiscal impact of specific facility threats and inundation will be initiated using, among other methods, the REMI model. Key tasks include:

**A.3.1:** Identify critical infrastructure.

**A.3.2:** GIS-based scenario planning/vulnerability assessments on identified critical assets. Conduct Asset Exposure Analysis. The asset exposure analysis will involve using GIS to overlay the assets with each of the 45 maps showing tidal flooding depths and 50 maps showing storm surge depths. In the attribute tables of each asset layer, the timing of the impacts will be noted as well as the depth of flooding; critical information for subsequent steps. For elevated roadways, care will be taken to determine the estimated depth of inundation of the bridge structure. Six county-wide maps of the impacted assets under each climate scenario in the year 2100 will be created (3 SLR scenarios x 2 hazards x 1 frequency value per hazard [e.g. one day of tidal flooding per year, 100-year storm] = 6 total maps). The frequencies to show on the maps will be determined in conjunction with the county. At the conclusion of this task, two Consultant team members will attend the regularly scheduled monthly meeting in person to summarize the results of the exposure analysis and discuss next steps. Other Consultant technical staff will participate via webinar, as necessary.

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

##### *Deliverables*

**Task A.3.2.a** Updated asset geodatabase with tidal flooding and storm surge depth information included

**Task A.3.2.b** Six maps showing assets impacted by tidal flooding and storm surge in 2100

**Task A.3.2.c** Develop Asset Depth-Damage Functions. In this task, Consultants will develop depth-damage functions for a subset of exposed assets. Working with the County project team and the RWG as may be required, a minimum of 30 and maximum of 40 assets will be selected to create depth-damage functions, as described in the Proposal for Services submitted by the Consultant team. The exact number of assets analyzed will be negotiated depending on the complexity of the assets found to be and remaining budget. Each function will relate the depth of inundation to a dollar value of damage (based on both physical repair costs and socioeconomic costs to users). RWG members will be coordinated with to develop the assumptions underlying the depth-damage functions. The functions will be created in a spreadsheet and this will be provided to the county as a deliverable. Spreadsheet containing depth-damage functions for each of the selected exposed assets.

**A.3.3** Undertake Vulnerability Scoring and Asset Ranking. This task will entail calculation of the expected damage costs (from both tidal flooding and storm surge) for the exposed assets selected in Task 3.2 through the year 2100. Expected damage costs will be calculated separately for each of the three sea level rise scenarios and then averaged for each asset to produce that asset's overall vulnerability score. The vulnerability scores will then be ranked from highest to lowest to provide an indication of adaptation priorities. The deliverable from this task will be an updated version of the spreadsheet from Task 3.2 containing the formulae used to calculate the vulnerability scores and the outputs of the ranking.

**A.3.4:** Consider relationships/opportunities presented via interplay between the natural and built environment.

**A.3.5:** Initiate economic analysis [e.g., TBRPC's Regional Economic Model (REMI) tool and analysis]

#### **Task A.4 – ADAPTATION STRATEGY DEVELOPMENT** [estimated 9-month duration]

The objective of this task is to assess Phase A results and begin to apply mitigation and adaptation strategies to the critical assets. The consultant will identify and develop effective, feasible, and cost-sensitive adaptation strategies for impacted assets identified in Task 4.2. Primary emphasis will be placed on orienting strategies to coincide with the regular asset renewal cycle (mainstreaming). Adaptation alternatives will be developed through guided stakeholder outreach, supported by a customized decision-making matrix and expert guidance from consultant planners, scientists, and engineers. For a selection of preferred alternatives (e.g., for the 10-20 assets identified in Task 4.2), order of magnitude costs will be developed to facilitate consideration by the lead team. Key tasks include:

**A.4.1:** Conduct Facility-Level Adaptation Assessments that identify and test mitigation and adaptation strategies, alternatives and scenarios.

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

In this task, ten (10) vulnerable assets will be selected for detailed facility-level adaptation assessments. The adaptation assessments will utilize the Adaptation Decision-making Assessment Process (ADAP) framework. This framework entails steps that:

- detail precisely how an asset is exposed to climate change,
- formulate adaptation options to mitigate the threat, and
- evaluate the benefits and costs of each adaptation option so that the most cost-effective option can be chosen.

The specific assets selected for this task will be determined in conjunction with the county. One option may be to select the most vulnerable asset from eight of the asset/community lifeline types (i.e. one transportation facility, one water supply asset, one wastewater asset, one natural gas asset, and one energy asset, one health and medical asset, one safety/security asset, one food/shelter asset and one stormwater asset) so that it can be shown how ADAP can be applied to each. This would also enable a greater number of participating agencies to be involved and engaged in the work.

Each asset assessment will consider three SLR scenarios, the same one used for the vulnerability analysis.

Also, a maximum of three adaptation options will be evaluated for each asset. The deliverables for this task will be technical memorandums for each asset documenting each ADAP step. Associated engineering and economic analysis spreadsheets and data will also be provided.

#### ***Deliverables***

1. Technical memorandum (eight total) documenting each asset's assessment and methodology
2. Engineering data and spreadsheets
3. Economic analysis data and spreadsheets

**A.4.2:** Decision and long-range planning tools for assessing cost-benefit of adaptation and/or mitigation proposals for critical infrastructure; includes estimates of economic impact and economic damage where feasible for integration into the decision making/prioritization approach, as appropriate.

**4.3:** Final Report, including summary economic analysis, key infrastructure vulnerabilities and opportunities, as well as policy recommendations, priority recommendations and a recommended action plan. The final report will, at a minimum:

- Document the screening process for prioritizing critical infrastructure including a GIS geodatabase and tabular inventory of selected asset types.
- Document the potential climate vulnerabilities and risks due to sea level rise (and related effects such as storm surge, flooding, etc.).
- Identify candidate adaptation projects, including rationales and justifications (economic and otherwise) for inclusion in local government capital planning and programming.

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

- Recommendations for further development of the GIS decision-support tool.
- Recommendations for the future advancement of regional climate resiliency activities in the transportation, utilities and stormwater sectors.
- An executive summary and web content, summarizing the science, results and recommendations.

Resiliency assessments are a key tool for informing adaptation planning and enabling infrastructure managers to make such sound judgments and investment decisions. A sea level rise resiliency assessment provides two essential contributions to adaptation planning. Specifically, it helps to:

- identify which infrastructure is most likely to be most impacted by projected changes in sea levels; and
- understand how to adapt existing and future infrastructure to new environmental conditions. Determining which infrastructure sectors are most vulnerable enables managers to better set priorities for investment decisions, while understanding why they are vulnerable provides a basis for developing appropriate adaptation and mitigation strategies.

#### PHASE A DELIVERABLES

##### Task A.1 - PROJECT KICKOFF

**Task A.1.1.a:** Request for Proposal Issuance (County)

**Task A.1.1.b:** Collaborators/Liaison Contact List (County)

**Task A.1.1.c:** Consultant Agreement Executed (County and Consultant)

**Task A.1.1.d:** Stakeholder Contact List (County and Consultant)

**Task A.1.1.e:** Project Team Identification (County and Consultant)

**Task A.1.2. a:** Confirm Goals, Objectives, and Project Management Plan/Timeline

**Task A.1.2. b:** Kick-off meeting attendance logs, minutes (Consultant)

##### Task A.2 – DATA COLLECTION AND ANALYSIS (countywide)

**Task A.2.1:** Climate and sea level data/methodology technical memo. (Consultant)

**Task A.2.2:** Data layers. Data and Data Gap technical memo. (Consultant)

**Task A.2.3:** Asset inventory (at a minimum, one from each community lifeline; includes relevant infrastructure data from county, municipal as well as non-municipal and county providers (spreadsheet and GIS layers). (Consultant)

**Task A.2.4.a:** Enhanced GIS database design and development. GIS layers: best available, regionally-scaled transportation, utilities, stormwater, climate data, Flood Insurance Rate Maps (FIRMs), and topographic data (LiDAR/DEMs) from local, regional (TBRPC and Tampa Bay Network to End Hunger), state, and national agencies, etc. Existing and planned infrastructure networks/layers integration into Resiliency GIS database. The focus of the infrastructure data collection will be facilities of countywide significance, but all readily available data will be integrated if relevant. Existing data/layers on sea level rise and inland flooding. Confirm Goals, Objectives, and Project Management Work Plan. (Consultant, with assistance of County Departments GIS staff (PDD, PW, GIS).

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

**Task A.2.4.b.** Data layers, Data and information gaps and Analysis Technical Memorandum. Other environmental data which may impact infrastructure vulnerability assessment or identification of mitigation and adaptation strategies will be identified for inclusion in the analysis. Additional or updated climate data from the Tampa Bay Climate Science Advisory Panel (CSAP) is likely to include scenarios of sea level rise, developed based on specific analysis years and impact thresholds required for infrastructure vulnerability analysis. Available plans and studies that are relevant to the analysis will also be identified at this time (e.g., Long Range Transportation Plan, Local Mitigation Strategy, Watershed Plans, Post Disaster Redevelopment Plan, 2025 Pasco County Comprehensive Plan, etc.).

Once the asset datasets have been finalized, elevation information for each asset will be derived from the 2018 Florida Division of Emergency Management LiDAR-based DEM. This is the most recent high resolution elevation dataset currently available for the county. The Consultant team will monitor progress on creating that DEM and will seek to make use of it if the project timeline allows.

The finalized GIS data, with elevation information appended, will be gathered into a geodatabase and supplied to the county as a deliverable. Where data has been formatted or digitized by the Consultant team, basic metadata describing the activities undertaken will be included. (Consultant)

#### ***Deliverable***

**Task A.2.4.b** Geodatabase containing all asset data to be used on the project.

#### **Task A.3 – VULNERABILITY and RISK ASSESSMENT**

**Task A.3.1:** Conduct Asset Exposure Analysis. Identify critical infrastructure. (Consultant)

**Task A.3.2:** Develop Asset Depth-Damage Functions. Critical Assets Scenario Technical Memorandum. (Consultant)

**Task A.3.3.a:** Undertake Vulnerability Scoring and Asset Ranking. (Consultant and County)

**Task A.3.3.b:** Exhibit I – Vulnerability Scoring and Asset Ranking Chart. (Consultant)

**Task A.3.4.a:** Initiate economic analysis [e.g., TBRPC's Regional Economic Model (REM) tool and analysis]. (Consultant with assistance from County OEG and PDD staff, if needed)

**Task A.3.4.b:** Economic Analysis Technical Memorandum. (Consultant)

#### **Task A.4 – STRATEGY DEVELOPMENT [estimated 9-month duration]**

**Task 4.1.a:** Identification and testing of mitigation and adaptation strategies, alternatives and scenarios. (Consultant, with assistance from RWG)

**Task 4.1.b:** Mitigation and adaptation strategies best management practices infographics. (Consultant)

**Task 4.2.a:** Decision and long-range planning tools for assessing cost-benefit of adaptation and/or mitigation proposals for critical infrastructure; includes estimates of economic impact and economic damage where feasible for integration into the decision making/prioritization approach, as appropriate. (Consultant, with consultation of key County staff).

**Task 4.2.b:** Conduct Facility-Level Adaptation Assessments (Consultant)

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

**Task 4.2.c:** Decision-making Matrix tool/Prioritization Approach Technical Memorandum (Consultant, with approval of tool and prioritization approach by RWG).

**Task 4.3:** Final Report, including summary economic analysis, key infrastructure vulnerabilities and opportunities, as well as policy recommendations, priority recommendations and a recommended action plan. The final report will, at a minimum:

**Task 4.3.a:** Document the screening process for prioritizing critical infrastructure including a GIS geodatabase and tabular inventory of selected asset types. (Consultant)

**Task 4.3.b:** Document the potential climate vulnerabilities and risks due to sea level rise (and related effects such as storm surge, flooding, etc.). (Consultant)

**Task 4.3.c:** Identify candidate adaptation projects, including rationales and justifications (economic and otherwise) for inclusion in local government capital planning and programming. (Consultant)

**Task 4.3.d:** Recommendations for further development of the GIS decision-support tool. (Consultant)

**Task 4.3.e:** Recommendations for the future advancement of regional climate resiliency activities in the transportation, utilities and stormwater sectors. (Consultant)

**Task 4.3.f:** An executive summary and web content, summarizing the science, results and recommendations. (Consultant)

#### Task A.5 – FINAL REPORT

Phase 5 consists of one task that develops a project report documenting the work performed in PHASE A: Vulnerability Assessment, Phases 1 through 4.

##### Task A.5.1 – Develop the Final Report

A final report will be developed under this task to document project work, findings, and recommendations.

The final project report will highlight the following:

- Project goals and objectives
- Data sources
- A review of the vulnerability scoring method and the results
- Additional functionality that could be built into the county's climate adaptation decision support tool to feature/display information generated during the vulnerability assessment
- The results of the five facility-level adaptation assessments
- Overarching project conclusions and recommendations

The final report will be written in a way that enables staff to learn how to conduct similar assessments. The report will also document any lessons learned or recommended refinements to the process that could improve the effort down the road. Also, to the maximum extent possible, the report will make use of language already developed in earlier technical memoranda. This will greatly enhance the efficiency of this effort.

The deliverables for this task will consist of:

- an outline of the final report
- one final report draft and

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

- one final report document.

The task will begin with the development an outline by the Consultant team. This will be sent to the county for review and changed based on the feedback received. Next, an initial draft of the final report will be produced based on the revised outline. This too will be submitted to the county who will consolidate all their edits and comments into one track-changed Word document and send back to the Consultant.

The Consultant team will then incorporate any edits and address any comments and develop a final version of the report to submit as the final deliverable for this project.

#### *Deliverables*

**Task A.5.1.a.** Final report outline

**Task A.5.1.b.** One draft report document

**Task A.5.1.c.** One final report document

#### **B. PHASE B: RESILIENCY & SUSTAINABILITY PLAN SCOPE OF WORK:**

Development of the Resiliency and Sustainability Plan will be a collaborative process, working in unison with county staff and communities, and will be an actionable, dynamic guidance document and tool. The project will involve and achieve, but not be limited to, the following key objectives:

- a. Position the County to have a greater understanding of their sustainability and resiliency challenges and opportunities related to existing vulnerabilities and future conditions outlined in existing studies and best-available data;
- b. Examine the gaps and synergies between existing County programs, policies, and projects;
- c. Integrate practices, policies, and procedures into the overall operations and functioning of the County and its priorities (e.g., capital expenditures, performance measures, CIP project ranking, budgetary decision packages, procurement, internal appropriations, operations, and maintenance, etc.);
- d. Outline methodologies and/or develop tools to evaluate fiscal, economic, societal, and environmental impacts and return on investments;
- e. Support the County's Resiliency Project Manager with guidance for implementing the Plan goals and measures; and,
- f. Provide the County with recommendations and strategies on how to best implement a holistic and comprehensive sustainability and resiliency plan that ensures successful internal action with external benefits.

The Phase B, Resiliency & Sustainability Plan Scope of Work will be completed as follows:

## **RESILIENT PASCO**

### **Vulnerability Assessment and Sustainability & Resiliency Plan**

#### **Draft Scope of Work**

#### **Task B.1 – RESILIENCY & SUSTAINABILITY PROJECT KICKOFF** [estimated 3 month duration]

The objective of this phase is to initiate the project and familiarize the consultant(s) to the existing county structure, functionality, staff roles, and services.

**B.1.1.a:** Phase kick-off meeting with County Resiliency Team. At the initiation of the project, Consultant's project team will facilitate a meeting with a core group of key representatives from Pasco County to confirm project goals and the associated data required to accomplish them throughout each phase of the study. The project kick-off meeting with the Resiliency Working Group TEAM (RWG) and a draft project management work plan. The RWG members will likely be a mix of county employees. On this task, the Consultant team will be responsible for taking meeting minutes and preparing a work plan based on the outcomes of the meeting. Two Consultant team members will attend the kickoff meeting in person with others participating via webinar as needed. (Consultant and RWGT).

**B.1.1.b:** The Resiliency Project Team (TEAM) will have its first meeting. One purpose of the meeting will be to solicit feedback from the TEAM on the project management work plan created in Task 1.1. Input from the TEAM will be used to finalize the project management work plan. A second purpose of the meeting is to form committees (planning teams) within the TEAM that focus on specific topic areas relevant to the project. These committees will be called upon to participate in project meetings and review deliverables at key points during the project. For this task, the Consultant team will be responsible for preparing an initial list of TEAM committees, taking the TEAM meeting minutes, and preparing a final project scope based on the TEAM input.

**B.1.2:** Introductory meeting(s) phone interviews with designated county and key collaborating agency staff and municipal liaisons. (Consultant and Project Manager).

**B.1.3:** Conduct Ongoing Project Management Activities. Resiliency projects require more intensive communication and coordination than many other projects due to the novelty and complexity of the subject matter. Thus, it will be critical that there be regular communication on the project as it proceeds. To that end, this task will include regular monthly status calls between the Consultant project team and county staff over the life of the project. Various RWG or TEAM members may be asked to participate on some of these calls at key points in the project. Consultant will be responsible for providing minutes from these calls. In addition, this task will include preparation by Consultant of quarterly project status reports.

#### **Task B.2 – DATA COLLECTION AND PREPERATION** [estimated 3 month duration]

The objective of this phase is to conduct an internal quantitative assessment and gap analysis of the County's historical and existing organizational efforts, plans, services, processes, and structure related to sustainability and resiliency activities. Results should be compared to industry best practices, inform the development of the Plan, and provide recommendations and solutions for change. Information and data of ongoing programs, projects, and policies collected by the County's Resiliency Working Group (RWG) members will be provided to the Consultant to help launch the initial stages of the assessment.

The collection, review, development, organization, and use of data is a critical part of this project and will require close coordination with a variety of county departments, local governments, private companies, and other organizations. This phase of work discusses the development of the hazard data

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

and the asset data that was developed in Phase A in the vulnerability assessment and for the county's GIS based climate adaptation decision support tool.

#### **B.2.1 – Develop Hazard Data**

Two hazards will be investigated as part of this project and included in the county's climate adaptation decision support tool: (1) tidal flooding (flooding due to SLR that occurs outside of storm events) and (2) storm surge. For each hazard, three SLR scenarios will be investigated using the latest projections from the National Oceanic and Atmospheric Administration (NOAA). The projections that will be used are published in a NOAA technical report titled "Global and Regional Sea Level Rise Scenarios for the United States" dated January 2017 (hereafter referred to as the "NOAA 2017" scenarios).

1. The projections will be adjusted to provide relative increases at the Saint Petersburg tide gauge using the United States Army Corps of Engineers (USACE) Sea-Level Change Curve Calculator.
2. The specific SLR scenarios to be evaluated include:
  - NOAA (2017) Intermediate-Low Scenario (1.9 ft. of SLR from 2000-2100)
  - NOAA (2017) Intermediate Scenario (3.9 ft. of SLR from 2000-2100)
  - NOAA (2017) High Scenario (8.5 ft. of SLR from 2000-2100)

#### ***B.2.1.A (subtask) – Develop Tidal Flooding Data***

Regular tidal flooding, outside of storm events, will become an increasingly common occurrence in low lying portions of the county as the 21st century progresses. To better understand this hazard, the Consultant team will map the frequency of tidal flooding by days of flooding per year (e.g., one map layer might show areas inundated by tidal flooding one day per year, another layer might show areas inundated by tidal flooding 25 days per year, etc.). A total of five increments of tidal flood frequency will be investigated. The specific values for the increments will be determined in coordination with the county after an initial investigation of the local tidal cycle. Information on water depths will be included in each inundation layer.

To show how the hazard will evolve over the 21st century, the suite of five tidal flooding map layers will be produced for three different horizon years. The horizon years to be used are:

- 2040
- 2070
- 2100

At each horizon year, three sets of maps will be created, one for each of the three NOAA 2017 SLR scenarios. Thus, 45 separate tidal flooding map layers showing flooding depth will be produced for this study (5 frequency increments x 3 future horizon years x 3 SLR scenarios = 45 total tidal flooding map layers). 45 additional map layers showing tidal flood elevations will be produced but only if there is significant tidal datum surface variation in the county (if not, this data is unnecessary since the flood elevation will be constant over all inundated locations).

The following steps will be undertaken by Consultant to generate the tidal flooding map layers:

1. Extract from the long historical record at the NOAA St. Petersburg gauge typical tide elevations (i.e., not including major storms).

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

2. De-trend the typical tide elevations to remove observed sea level rise to date.
3. For five increments of flooding frequency (expressed in average days of tidal flooding per year), determine the corresponding tidal elevation (not considering sea level rise).
4. For each of the five increments, add in the three NOAA SLR projections to obtain new corresponding tidal flood elevations in 2040, 2070, and 2100.
5. Establish a county-wide tidal datum surface (if tidal variation throughout the County is likely to introduce significant error).
6. Map the extent of sea level rise inundation at each horizon year under each sea level rise scenario using a “bathtub approach” with connectivity considerations. This approach compares the water elevation to the elevation of the land and ensures that there is a flow path for water to connect to the sea. This effort will make use of the latest LiDAR-based digital elevation model (DEM) available for the county.
7. Calculate flood depths for each inundation layer using the latest LiDAR-based DEM. We will also retain the absolute flood elevation value. The primary deliverable for this task will be the tidal flooding inundation raster layers for GIS. A Technical Memorandum documenting the technical methodology used to develop these layers will be provided by the Consultant.

#### ***Deliverables***

- 45 GIS-compatible raster layers of tidal flooding inundation extent with depths
- 45 GIS-compatible raster layers of tidal flooding inundation extent with absolute flood elevations (only if tidal variation throughout the county is deemed significant)
- Technical Memorandum explaining the tidal flooding mapping methodology

#### **B.2.1.B (subtask) – Develop Storm Surge Data**

The projections highlighted in the Tampa Bay Climate Science Advisory Panel’s “Recommended Projection of Sea Level Rise in the Tampa Bay Region” report from 2015 have been superseded by these more recent (2017) NOAA projections.

Use the 2017 NOAA projections (regionally corrected using St. Petersburg tide gauge data) to employ the latest science in the analysis.

Storm surge represents a clear and present danger to Pasco County. This danger will be exacerbated as sea levels rise. To better understand this hazard, the Consultant team secure the storm surge model of the Tampa Bay Region utilized by the Tampa Bay Regional Planning Council Resiliency Coalition and Pinellas County. The storm surge model will be used to produce map layers indicating (1) flood elevations and (2) the depth of flooding due to storms with the following return periods:

- 25-year
- 50-year
- 100-year
- 250-year

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

- 500-year

As with tidal flooding, the storm surge inundation maps will be produced for the years 2040, 2070, and 2100 and for each of the three NOAA 2017 SLR scenarios. In addition, inundation maps will also be produced for current sea levels so that present day risks can also be evaluated. Thus, 50 separate map layers showing storm surge inundation extents will be produced to show flood elevations and 50 to show flood depths ([5 return periods x 3 future horizon years x 3 SLR scenarios] + 5 return period maps for current conditions) resulting in 100 total storm surge map layers.

1. The following steps will be undertaken by the Consultant team to generate the storm surge flooding map layers:

- A suite of storms is needed to run through the surge models to develop return period flood mapping.
- For each period to be analyzed (current conditions, 2040, 2070, and 2100), we will obtain all the coastal storms projected for Pasco County.
- For the future horizon years, storms will be obtained for the Representative Concentration Pathway (RCP) greenhouse gas (GHG) emissions scenarios that correspond best with each of the three SLR scenarios. The storms, which have been determined by the FSU-COAPS atmospheric model and downscaled (i.e. increased in spatial resolution) using the 7.5-mile resolution WRF (Weather Research and Forecasting) model, will be used by the Advanced Coastal Environmental Simulations (ACES) Laboratory at the University of Florida for this project.

2. Typically, thousands of projected storms are simulated using a surge model to consider all possible intensities, tracks, and sizes and thereby ensure the statistical robustness of the outputs. This, however, can be quite time-consuming since it requires a great deal of computational processing. To get around this issue, the University of Florida will use a statistical technique called the Joint Probability Method with Optimal Sampling (JPM-OS) to reduce the number of storms needed (and, therefore, the processing time) while still producing statistically reliable results. The Consultants will use the JPM-OS method to reduce the storm ensemble to 100-200 representative storms per horizon year and climate scenario.

3. Next, the Consultant team will develop a high-resolution (50- to 330-foot) model grid over the land portion of Pasco County and a 100- to 820-foot model grid over nearby coastal waters.

4. Following this, the Consultant team will deploy the Advanced Coastal Modeling System (ACMS) to determine peak water levels throughout the county with the projected storms under today's sea level conditions. This will enable calibration of the model and the development of the return period inundation maps for today's conditions. ACMS is a suite of models that work together to consider storm winds, waves, tides, precipitations and river flow in order to provide projections of peak water levels. The modeling suite includes large-scale (large geographic scope) storm surge and wave models (ADCIRC and WWI, respectively) that are then tied into a near-shore hydrodynamic storm surge model (CH3D) with a dynamically coupled wave model (SWAN).

5. Next, the Consultant team will deploy the Advanced Coastal Modeling System (ACMS) to determine peak water levels throughout the county with the projected future storms and sea level rise.

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

6. Following this the Consultant team will statistically combine the storm surge inundation maps from each storm to produce storm surge inundation maps for the 25-, 50-, 100-, 250-, and 500-year storms for present-day conditions and each horizon year and sea level rise scenario

7. Lastly, the Consultant team will calculate flood depths for each inundation layer using a LiDAR-derived DEM. We will retain the absolute flood elevation value as well. The primary deliverable for this task will be the storm surge flooding inundation raster layers for GIS. A detailed model grid file showing topography and bathymetry and a memo documenting the technical methodology used to develop these layers will also be provided.

#### **Deliverables**

- 50 GIS-compatible raster layers of storm surge flooding inundation extent with depths
- 50 GIS-compatible raster layers of storm surge flooding inundation extent with absolute flood elevations
- Model grid file showing bathymetry and topography
- Technical memorandum explaining the storm surge modeling and mapping methodology

#### **Task 2 – Internal Program and Process Assessment**

**B.2.1:** Quantitative Assessment and Gap Analysis (Consultant)

**B.2.2.a:** Best Practices Comparison (Consultant, with feedback/ information from RWG)

**B.2.2.b:** Recommendations Technical Memo (Consultant)

#### **Task 3 – EXTERNAL STAKEHOLDER ENGAGEMENT** [3 months duration]

The objective of this phase is to conduct a County-wide external stakeholder engagement effort to inform the development and implementation of the County's Plan. Engagement strategies will include interaction with unincorporated communities and extend to surrounding local governments, regional organizations, private-sector industry, elected officials, and State and Federal agencies.

**B.3.1.a** Countywide Stakeholder Public Meetings/Workshops (4 workshops – geographically spread ( 1 South Harbors, 1 North Harbors, 1 Central, 1 East (Dade City) (Consultant with County Project Manager and RWG assistance)

**B.3.1.b** External local government stakeholders' outreach/meetings with key staff (11 meetings – TBRPC, Hillsborough County, Pinellas County, Sumter County, Hernando County, Polk County, City of Dade City, City of New Port Richey, City of Port Richey, Village of San Antonio, City of Zephyrhills). Create contact list of key staff with each local government. Issue meeting invitations (with assistance of County Project Manager). Lead meeting discussions. (public engagement strategy plan, public participation tools) (Consultant with County Project Manager and RWG Assistance)

**B.3.1.b.** Meeting attendance logs, meeting minutes, PowerPoint presentation(s), agenda, handouts, (public engagement strategy plan, public participation tools). (Consultant, with County Project Manager review of all workshop/meeting materials and PowerPoints in advance of meetings).

**B.3.1.c.** External Stakeholder Engagement Summary Technical Memorandum (Consultant)

#### **Task B. 4 - PLAN DEVELOPMENT** [12 months duration]

The objective of this phase is to incorporate findings from all previous project phases to develop the County's Plan, most prominently the foundational vision, mission, goals, objectives, and action items. This phase will include a gap and opportunities assessment for sustainability and resiliency programs,

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

initiatives, and best practices for internal operations, cross-departmental synergies, procedures, strategic partnerships, and external services. This process will be completed in conjunction with County staff and approved by County Administration.

**B.4.1.** Draft Plan (review by County Project Manager and RWG).

**B.4.2.** Revised Plan (review by local governments, County Project Manager and County Administrator) (Consultant, with assistance from County Project Manager)

**B.4.3.** Final Plan (Approvals required by RWG, County Project Manager and County Administrator) (Consultant, with assistance from County Project Manager)

#### **Task 5 – Program Implementation** [9 months duration]

The objective of this phase is to advise the County with prioritized recommendations and action items to launch the ambitions of the Plan, including guidance documentation, technical assistance and/or training, educational material, finance mechanisms, and external engagement. The phase also includes assistance with internal and outreach activities and material.

**B.5.1** Website Updates

**B.5.2.** Program Organizational Chart, job descriptions, etc. drafts. (Consultant, with assistance from County Project Manager and RWG)

**B.5.2** Program Implementation Matrix Tool (Consultant)

#### **Task 6 - Optional Services** [to be determined]

If additional funding becomes available, the County and/or current or future project partners may engage the consultant to perform to understand better-associated tasks.

Key undertakings may include but are not limited to:

- a. Conduct a county-wide Green House Gas (GHG) Emissions Inventory;
- b. Integrate identified Plan objectives/metrics into the comprehensive plan; departmental work plans, and County strategic plan;
- c. Create a Mitigation Rapid Action Plan to Future Conditions and/or Capital Planning Tool;
- d. Develop a county-specific, sustainability-focused mechanism to evaluate the Return on Investment (ROI) for existing, current, and new sustainability and resiliency initiatives;
- e. Conduct regional, large-scale hazard mitigation investment and implementation studies;
- f. Create a county-wide future conditions flood map; and/or

Identify Adaptation Action Areas based on vulnerability data analysis and planning objectives.

#### **C. DISCIPLINES REQUIRED FOR PHASE A & PHASE B:**

Multidisciplinary efforts include, but are limited to, the following:

- Planning and/or environmental services (Comprehensive; engineering; coastal management; climate adaptation; sustainability).
- The firm shall demonstrate that they have completed a minimum of two (2) sustainability, resiliency, or climate action plans within the last five (5) years.

#### **D. BUDGET ESTIMATE FOR PHASE A & PHASE B:**

PHASE A: \$300,000.00

## **RESILIENT PASCO**

### **Vulnerability Assessment and Sustainability & Resiliency Plan**

#### **Draft Scope of Work**

PHASE B: \$250,000.00

Grant Administrative Costs: \$49,500.00

GRAND TOTAL: \$599,500.00, inclusive of services outlined in the scope of work.

#### **E. PROJECT LOCATION:**

The project location is Pasco County, an 868 square mile area (122 square miles of waterbodies) comprised of 6 local governments, located on the western-most coast of Central Florida, with the Gulf of Mexico on its western edge, Pinellas to the southwest, Polk County to the southeast and Hillsborough County to the south, Sumter County to the north east and Hernando County to the north. Please refer to the attached map of Pasco County, as well as a watershed map of the overall County (there are 23 watersheds within the Pasco County boundary). General latitude and longitude coordinates are 28°18'N 82°26'W.

The geographic area for the project encompasses all of the 6 local government jurisdictions within the boundaries of Pasco County. These include:

- Dade City
- New Port Richey
- Port Richey
- San Antonio
- Zephyrhills
- Unincorporated Pasco County

As a large urban, suburban and rural county bordering the Gulf of Mexico and made up of 6 local governments, planning separately community by community when faced with a collective challenge is counter-productive logistically and fiscally, particularly when the benefits of this project are intended to serve the citizens and business owners of the entire Pasco Community. The impacts of sea level rise will not recognize jurisdictional boundaries. The existing network of roads and utility infrastructure already transcends individual local government limits; flooding and inundation events do not respect county or municipal limits. Responding collaboratively to the collective challenge of sea level rise only makes sense.

#### **F. PROJECT PARTNERS:**

Pasco County Government, Tampa Bay Regional Planning Council, Pasco County Metropolitan Planning Council.

Key Staff/Lead Project Team includes: (each of the team members below have been assembled for their experience and a multi-year history of involvement in local government planning, project management, scientific studies, environmental science, water and natural systems management, infrastructure planning and design, as well as several years' experience monitoring climate findings and science, and participating in, among other related activities, the climate and sea level collaborations described elsewhere in this application).

- Allan Biddlecombe, Public Works Administrator, Public Services Branch

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

- Mary Helen Duke, Sr. Planner – Project Management (Grant Project Manager), Long Range Planning Division, Pasco Planning and Development Department
- Dr. Renee Brown, Natural Resources Division Manager, Pasco County Parks, Recreation and Natural Resources Department
- To be determined, Floodplain Coordinator, Pasco County Permitting/Central Services Department
- Deborah Bolduc, Capital Improvements Program Administrator, Pasco Public Infrastructure Branch, Engineering Services Department, Project Management Division
- CJ Reynolds, Director of Resiliency and Citizen Engagement, TBRPC
- Amy Hyler, Planner II, Long Range Planning Division, Pasco Planning and Development Department
- Maya Burke, Senior Planner (Environmental), TBRPC
- Brady Smith, Principal Planner (Emergency Management), TBRPC
- Ronnie Blackshear, MPO Director, Pasco MPO

A consultant will complete the project with direction and assistance from the project team.

#### G. TECHNICAL FEASIBILITY

Pasco County has monitored the sea level work and science in South Florida for several years, including the collaboration towards the Southeast Florida Regional Climate Compact and the preliminary technical assessments of vulnerability done in association with development of the Compact, as well as planning and technical work underway in South Florida (e.g., the Broward County MPO is assessing the vulnerability of transportation infrastructure; Broward County government is starting to look at protection and mitigation strategies, as well as design standards, Miami-Dade has adopted a resolution requiring consideration of sea level rise in all infrastructure planning decisions, etc.). The County has convened an internal multi-disciplinary Pasco Resiliency team and has been building up background in climate planning and science. Over the past year, the County has engaged the assistance of the USF Honors Practicum students (2) in conducting a resiliency crosswalk of the Pasco County 2025 Comprehensive Plan and the Tampa Bay Estuary Program Coastal Conservation Management Plan and model language recommended by TBRPC.

The Tampa Bay Regional Planning Council has taken the initiative to form the One Bay Resilient Communities Working Group, along with participating in a technical team of area scientists, (the Tampa Bay Climate Advisory Panel) facilitated by UF/Florida Sea Grant staff, focused on evaluating current sea level science and facilitating agreement on sea level rise projections for the region, and involving examination of the most recent Army Corp of Engineering (ACOE) and National Oceanographic and Atmospheric Administration (NOAA) modeling and scenarios. The Hillsborough County Metropolitan Planning Organization recently initiated an assessment of transportation infrastructure and sea level vulnerability using the FDOT Sketch Planning Tool, developed by UF/GeoPlan Center, for assessment of their transportation system vulnerability. This study included an evaluation of SR 54 and US 19 in Pasco County. This provides an excellent model as a starting place for Pasco County's assessment.

The Pasco County project intends to build on the scientific work done to date (including the pilot project work by the Hillsborough MPO), using professional technical consultant assistance, in order to conduct a

## **RESILIENT PASCO**

### **Vulnerability Assessment and Sustainability & Resiliency Plan**

#### **Draft Scope of Work**

comprehensive and collaborative assessment of infrastructure vulnerability, economic impact, and evaluation of mitigative and adaptive strategies in Pasco County.

Additionally, the TBRPC operates a sophisticated economic modeling and analysis operation through its regional information center, using Regional Economic Models, Inc. (or REMI). They are equipped to conduct a variety of scenarios and economic analyses specific to individual counties and the region as a whole, and in fact provided technical support to the Hillsborough initiative. Their work will be coupled with the work of the Tampa Bay Climate Adaptation Science Advisory Panel and be translatable at the county, regional and State level. County and TBRPC staff are also involved in the sea level planning work underway by the Tampa Bay Estuary Program. Each of the partners to this project have identified success in managing large and comprehensive technical projects, and managing large consultant contracts. All three partners routinely manage large planning and technical consultant contracts.

#### **G. PUBLIC ACCEPTANCE**

As part of the Pasco County Post Disaster Recovery Plan, adopted by the State of Florida in 2016, Pasco County identified planning for sea level rise and changes in the environment as a future challenge. At that time, they acknowledged that an assessment of vulnerability is an important first step in understanding what steps are required to better plan for a resilient environment, economy and community. Since that time, the Pasco County Board of County Commissioners joined the Tampa Bay Regional Planning Council Resiliency Coalition. County staff actively participates in the Resiliency Coalition's Management and Planning Committee, the UF/Florida Sea Grant Climate Science Advisory Panel and other TBRPC resiliency initiatives to communicate and learn best practices of other local governments in the Tampa Bay Region, assessing their interest, needs and awareness of the sea level rise challenge, and gauging the desire to start planning together. While the project is not complete, we are advised that there is interest among other governments in working together on the sea level rise challenge. For this reason, municipal representatives will be critical partners on the project team. Economic development officials have emphasized that the message not be one of doom and gloom, as the viability of the local economy is essential to the sustainability of a quality Pasco community. New investment and business growth must not be scared away by planning scenarios and maps. The project goal and message will need to be clear that planning for a more resilient community supports quality investment opportunities in the future.

#### **H. COLLABORATIVE APPROACH**

The Tampa Bay Regional Planning Council (TBRPC) will be a key partner to the project. They have been instrumental in convening governments in the region to begin to assess and address the impacts of a changing environment, and in fact TBRPC recently initiated a two year project to facilitate knowledge-sharing and help develop decision support tools that will improve the regional capacity to withstand the effects of sea level rise and coastal hazards. Through this forum, they are also promoting the recommendations of the Tampa Bay Climate Science Advisory Panel (CSAP) currently studying the sea level rise models and local data pertinent to the Tampa Bay Region, and will be working to promote regional climate resilience policy. Additionally, they house considerable disaster management, economic and GIS technical expertise in-house which will be committed to the project, and will be part of the lead project team.

## RESILIENT PASCO

### Vulnerability Assessment and Sustainability & Resiliency Plan

#### Draft Scope of Work

The Pasco County Metropolitan Planning Organization (MPO) is a countywide body responsible for long range planning for the County's transportation network. They administer the Countywide Long-Range Transportation Plan and its cost feasible component. They have been monitoring the work done around the State regarding transportation infrastructure resiliency and are ready to undertake a local initiative. They will commit staff and resources to the project and will be part of the lead project team.

#### I. ATTACHMENTS:

1. Attachment A: Small Business Enterprise (SBE) Status Form
2. Sample Agreement
3. Exhibit 1 – Pasco [Post Disaster Redevelopment Plan](#)
4. Exhibit 2 - Water Systems Risk and Resiliency Assessment
5. Exhibit 3 - [Guidance for Incorporating SLR into Capital Planning](#)
6. Exhibit 4 – [Resiliency Working Group Draft Charter](#)
7. Exhibit 5 - [Sustainability & Resiliency Resource Hyperlinks](#)
8. Exhibit 6 – [Pasco County Purchasing Ordinance](#)
9. Exhibit 7 – [Vendor Fillable Form](#)