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## Adaptation Planning Framework Worksheet

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### 1. CONTEXT

#### 1A. Guiding principles and motivations for sea level rise planning.

- CCME Objective 1.5 and Policies 11.5.1 – 11.5.4

#### 1B. Planning area and geographic context

- The AAA boundary should be defined as, or take into consideration, the greater of the Cat 3 storm surge area or the FEMA 500-year flood plain as shown (2019) but not include those 500-year flood plains disconnected from the Cat 3 surge area, and implement adaptation strategies commensurate with the storm and flood risks.

#### 1C. Define community participation opportunities and public engagement approach

- AAA Workgroup
- The City should establish a position or authority, create an office, and/or assign tasks to oversee and coordinate the planning of interagency resiliency programs and public and private projects, engage stakeholders to promote public-private partnerships, and manage and leverage funding for resiliency initiatives. Tasks of such a position, authority, or office may include, but are not limited to, educational outreach, development of resiliency tools or resources for public and private use, and creation of a resource center to assist property owners.
  - *City should consider a resiliency officer or coordinator or a resiliency office. The position would coordinate across Planning, Public Works, and Environmental Quality and would operate out of the Mayor's Office.*
  - *Hire a Chief Resiliency Officer to coordinate funding and planning between federal, state, regional and City resiliency initiatives. Help coordinate and prioritize City CIP projects that involve Jax Parks, COJ Emergency Preparedness, Environmental Quality Division, Public Works, Planning, Landscape and Maintenance, and more.*
  - *Develop a permitting resource center where people can find out the history and risks associated with properties in Duval County, as well as all permits required or potentially required by Federal, State, Regional and City agencies for future uses prior to the sale of real estate between buyers and sellers.*

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- *Provide educational outreach on sanitation in relation to water use and water contact during flooding events, wildfires, algae blooms, and power outages*
- The City should consider educating and disclosing flood hazards to the public through various mechanisms such as real estate disclosures, public mapping resources, community or city-wide public information campaigns, or other innovative and effective approaches.
  - *Update real estate transaction disclosure requirements to include hazards related to climate change including flood risk, zone, prior flood damage including surrounding property, before closing*
- Through educational campaigns, promotional materials, and partnerships with non-profits and private entities, the City should promote the implementation of green infrastructure solutions to mitigate flooding within the AAA.
  - *Promote and expand urban vegetation by planting trees, installing roof gardens, and protecting existing vegetation and open space*
  - *Increase maintenance and cleanup of gutters, drainage ditches and culverts*
  - *Manage Stormwater onsite utilizing low-impact development techniques [NOTE – see existing CCME Policy 6.7.3 and FLUE Policy 1.5.13 (under separate cover)]*

## 2. VULNERABILITY ASSESSMENT

- The City shall conduct a coastal flooding and sea level rise vulnerability assessment that includes storm surge, tidal fluctuations, and extreme rainfall events and identifies populations, habitats, infrastructure, and functions that may be most sensitive to coastal flooding and sea level rise.

The assessment shall take into consideration that Jacksonville has both a coastal and riverine system and that currently accepted flood models do not adequately take into consideration the riverine system, particularly west and south of the Mathews Bridge. Demographic, socioeconomic, and development data such as, but not limited to age (elderly and children); income; lack of personal transportation or transit-dependent; number of historic properties; government-owned properties; and locations connected to centralized water/sewer shall be considered when evaluating the city's sensitivity to coastal flooding and sea level rise within the AAA.

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- *Complete a sea level rise vulnerability assessment that includes storm surge, tidal fluctuations, and extreme rainfall events.*
- *Complete a vulnerability assessment to identify specific species, habitats, landscapes, ecosystem functions, and cultural resources such as museums and historical sites that may be the most sensitive to climate change*
- *Based upon the documented impacts of H. Irma in 2017, the COJ should acknowledge that recently adopted FEMA mapping for the sections of the AAA fronting the St. Johns River – extending from the Mathews Bridge southward to the county line – are inaccurate with respect to the extent of flood potential they are intended to represent. The COJ should provide interim guidance to property owners, as well as fund an area specific reanalysis of present day flooding potential in that area.*
- Based on available data, the City should study or analyze the conditions preceding, and during, Hurricane Irma (2017) and the area affected by flood waters resulting from the storm. Additionally, post-mitigation efforts should include documentation of the spatial limits of flooding after an extreme weather event.
  - *Recommend that COJ post-storm mitigation efforts include a comprehensive (and immediate) documentation of the spatial limits of upland flooding after a major storm event – by at least a drone survey. A post-storm report and mapping should be formulated and be made publicly available.*

#### 2A. Exposure

- The AAA boundary should be defined as, or take into consideration, the greater of the Cat 3 storm surge area or the FEMA 500-year flood plain as shown (2019) but not include those 500-year flood plains disconnected from the Cat 3 surge area, and implement adaptation strategies commensurate with the storm and flood risks.

#### 2B. Sensitivity

- The Planning and Development Department shall consider demographic, socioeconomic, and development data such as, but not limited to, age (elderly and children); income; lack of personal transportation or transit-dependent; number of historic properties; government-owned properties; and locations connected to centralized water/sewer when evaluating the city's sensitivity to coastal flooding and sea level rise within the AAA.

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## 2C. Adaptive Capacity

- The City should explore the use of a resilience scorecard and user guidelines to assist local planners and emergency managers to integrate disaster risk into Land Use and Zoning decisions and the feasibility of incentivizing green infrastructure and hazard mitigation projects on residential and commercial properties.
  - *Explore the use of a resilience scorecard and user guidelines to assist local planners and emergency managers to integrate disaster risk into Land Use and Zoning decisions.*
  - *Provide assistance or incentives for improving hazard preparedness of homes*
  - *Incentivize residential and commercial green infrastructure projects like natural shorelines, dune replenishment, tree planting and creation of Stormwater sinks. Place the highest priority for permitting estuarine shoreline stabilization on techniques that protect fisheries and aquatic mammals and promote biodiversity*

## 3. ADAPTATION STRATEGIES

- The City shall coordinate with the North Florida Transportation Planning Organization (NFTPO), the Jacksonville Transportation Authority (JTA), and the Florida Department of Transportation (FDOT) to mitigate flood hazards that may occur on adjacent properties because of elevating or elevated roadways.

### 3A. Classifications:

#### ➤ Protection

- The Land Development Regulations should be evaluated, and revised when feasible, to encourage and increase protection strategies for new development and significant redevelopment of properties within the AAA. Such protection strategies should consider nuisance flooding and tidal fluctuations and may include, but are not limited to, increasing buffers and setbacks; requiring or limiting (as appropriate) storm hardening or green infrastructure solutions; increasing freeboard requirements; requiring more stringent design standards for stormwater ponds (100-year storm design standard); and exploring the use of a resilience scorecard and user guidelines.
  - *Explore the use of a resilience scorecard and user guidelines to assist local planners and emergency managers to integrate disaster risk into Land Use and Zoning decisions.*
  - *Significantly increase estuarine buffers and oceanfront setbacks*

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- *Restrict hard-armoring in new development or in areas where hard armoring does not currently exist [NOTE – CCME Policy 7.3.4]*
- *Establish mandatory construction setbacks from the seawall, mean high water line, wetlands and waterways (currently 25-foot). Limit development on a property if sufficient setbacks cannot be met*
- *Require 2-feet of freeboard for structures located in tidally influenced floodplain; foundations that are more resilient to erosion and wave impacts or flood resilient construction materials in new and redevelopment project*
- *Evaluate the adoption of more stringent Building Code requirements, such as elevation above base flood level, for new construction or substantial reconstruction within the AAA taking into consideration the benefits and burdens of any such requirements.*
- *Legislate a requirement for developments to capture and treat Stormwater onsite from the 10—year 24-hour storm*
- *Present day COJ riverfront property commercial or multi-family design standards solely address the requirements of the St. Johns Water Management District regarding onsite water detention for a 25-year rainfall event. The COJ should promulgate design requirements for all sites located within the AAA which take into account all physiographic phenomena associated with a 100-year storm event, plus 2 ft. of sea level rise. This includes rainfall, storm surge, waves, drainage, etc. Documentation of same shall be certified by a Professional Engineer. A ready example of such a requirement are the design standards required by Statute for oceanfront development seaward of the Coastal Construction Control Line (CCCL) throughout Florida.*
- Existing Conservation / Coastal Management Element (CCME) Objective 4.1 and underlying policies (under separate cover)
  - *Protect and restore wetland ecosystems which provide natural first line of protection from storm surges and flooding*
- The City should assess and compare protection mechanisms, such as hard structural options like sea walls or other physical barriers and soft structural options like living shorelines and dune or wetland restoration, when designing and engineering such systems for capital improvement projects located within the AAA. Factors to compare and consider include, but may not be limited to, a cost/benefit

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analysis and an analysis of the short and long-term impacts of these systems to the surrounding area.

- *Investigate consequences of installing hard structural options (such as dikes, levees, floodwalls, and saltwater intrusion barriers) compared to soft structural options (such as dune restoration, living shorelines, and creation wetland restoration, periodic beach nourishment).*
  - *Evaluate the adoption of more stringent Building Code requirements, such as elevation above base flood level, for new construction or substantial reconstruction within the AAA taking into consideration the benefits and burdens of any such requirements.*
  - The City should consider the feasibility of various options for requiring the repair and maintenance of private walls that are critical in the protection of public infrastructure.
    - *Require that property owners who have private seawalls which protect public infrastructure – must repair or replace such seawalls if damaged by a major storm event. Example, River Road in Riverside. Failure to do so should necessitate that repairs be undertaken by the COJ at the upland owners expense.*
  - The City should consider prioritizing the repair, maintenance, and improvement of drainage infrastructure projects based on their location within the AAA, the historical significance of the area served, and the frequency of nuisance flooding within the area. Planning for the probable occurrence of nuisance flooding in the future may also be considered for prioritization.
    - *Require that the COJ prioritize and fund drainage solutions for present day nuisance flooding phenomena presently existent in the San Marco, Riverside and Avondale historical neighborhoods. Advance planning for the probable future occurrence of nuisance flooding within the AAA throughout the City Core as well, due to sea level rise, should be similarly prioritized.*
- Accommodation
- Existing Infrastructure Element, Drainage Sub-element (IE-Drainage) Objective 1.4 and underlying policies (under separate cover)
    - *Increase maintenance and cleanup of gutters, drainage ditches and culverts*
  - The City should evaluate the feasibility of updating the Master Stormwater Management Plan and prioritizing areas related to

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mapping floodplains in areas of the City not yet mapped; including alternative stormwater storage solutions and natural groundwater storage solutions such as, but not limited to, low impact development features, trees, and wetland systems; and evaluating and improving stormwater infrastructure to consider extreme storm events.

- *Update the Stormwater Master Plan to include alternatives to storage via retention ponds and to prioritize retaining trees and natural wetlands on site; ie: 25-foot vegetated buffer along shorelines and 100-foot buffer along wetlands, parks, and other protected areas.*
- *Conduct floodplain mapping in areas not detailed by the flood insurance study*
- *Evaluate and improve capacity of Stormwater infrastructure for high intensity rainfall events*
- *Manage Stormwater onsite utilizing low-impact development techniques [NOTE – see existing CCME Policy 6.7.3 and FLUE Policy 1.5.13 (under separate cover)]*
- The City should establish a methodology for pre-development and post-development calculations for groundwater conditions of undeveloped parcels that can be applied by developers and builders in order to understand the water storage capacity of land pre-development and to include the post-development capacity needs for both groundwater and stormwater.

➤ **Managed Retreat**

- **Existing CCME Policy 11.3.2 (under separate cover)**
  - *Develop a priority list and funding source for buying out Repetitive Loss Properties (RLP), removing structures, and restoring land to its predevelopment condition*
- The City shall evaluate the feasibility of providing incentives to the owners of existing structures located within the AAA for the removal of such structures or the renovation of such structures to bring them into compliance with Land Development Codes revised for adaptation and resiliency.
  - *If the City adopts more stringent Building Code requirements for property within the AAA, evaluate whether the City can or should provide incentives to the owners of existing structures located within the AAA for the removal of such structures or the renovation of such structures to bring them into compliance with revised Building Codes.*

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- The City should consider prohibiting public expenditures for the redevelopment of properties, not to include infrastructure, that are within both the AAA and the Central Business District which have been significantly impacted by an extreme weather event such that the properties are no longer viable for development.
  - *Prohibit COJ expenditures toward private and public development (or redevelopment) in the City Core for properties which are developed in the AAA and which will be impacted by a major storm event to the point that they could become inoperable or inaccessible. Publicly funded infrastructure would be excluded from such a prohibition.*
- Avoidance
  - Existing Future Land Use Element (FLUE) Policy 11.5.2 (under separate cover)
    - *Promote land use and agricultural practices including aquaculture, saline resistant crops, and animal agriculture outside of areas likely to flood*
  - In order to guide development away from flood-prone areas, the Planning and Development Department shall explore the feasibility of offering density bonuses, transfers of development rights, clustering development entitlements, or other similar types of strategies to limit new development being located within environmentally sensitive or special flood hazard areas.

#### 4. IMPLEMENTATION

- The City should establish a position or authority, create an office, and/or assign tasks to oversee and coordinate the planning of interagency resiliency programs and public and private projects, engage stakeholders to promote public-private partnerships, and manage and leverage funding for resiliency initiatives. Tasks of such a position, authority, or office may include, but are not limited to, educational outreach, development of resiliency tools or resources for public and private use, and creation of a resource center to assist property owners.
  - *City should consider a resiliency officer or coordinator or a resiliency office. The position would coordinate across Planning, Public Works, and Environmental Quality and would operate out of the Mayor's Office.*
  - *Hire a Chief Resiliency Officer to coordinate funding and planning between federal, state, regional and City resiliency initiatives. Help coordinate and prioritize City CIP projects that*

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*involve Jax Parks, COJ Emergency Preparedness, Environmental Quality Division, Public Works, Planning, Landscape and Maintenance, and more.*

- Existing CCME Policies 11.3.2 and 11.3.7
  - *Coordinate priorities, funding and resources with the Duval County Local Mitigation Strategy*
- The City should establish a technical advisory committee inclusive of relevant agencies and educational institutions to provide expertise regarding the different aspects of sea level rise adaptation. If deemed appropriate by the City, members of the technical advisory committee may contribute to the design review undertaken by the Downtown Development Review Board (DDRB) in order to consider the effects of sea level rise and storm surge effects on proposed projects and abutting properties in the Central Business District.
  - *Establish a consortium of state universities to undertake continuous economic analysis to develop costs and benefits of different aspects of climate adaptation*
  - *COJ should require a peer review of all project designs for proposed major commercial and/or multi-family developments within the City Core located within the AAA. A Technical Advisory Committee (TAC) should be formed for such a purpose in order to evaluate the effects of sea level rise and probable storm surge effects on flooding, drainage, infrastructure, intended use, impacts on abutting properties, etc.*
- The City should consider revising the Land Development Regulations to distinguish between properties within the AAA versus those outside of the AAA with regards to the current redevelopment or renovation threshold above which a structure must come into compliance with the City's Ordinance Code as regulations pertaining to properties within the AAA may be more stringent.
  - *If the City adopts more stringent Building Code requirements for property within the AAA, evaluate whether the Ordinance Code should be revised to distinguish between circumstances when a structure needs to be brought into compliance with the Zoning Code requirements such as landscaping and parking versus having to be brought into compliance with more stringent Building Code requirements which could include such requirements as elevating the structure.*
- The City's Emergency Preparedness Division shall consider collaborating with relevant entities and non-profit organizations in order to prepare for trauma associated with displacement and post-traumatic stress disorder following an extreme weather event.

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- *In the aftermath of extreme events, prepare for additional trauma due to dispossession, mental health challenges, and post traumatic-stress disorder*
  - The City shall continue to strengthen its efforts towards equity and environmental justice. With regards to communities living within the AAA, the City should monitor demographic, socioeconomic, and housing data to prevent or manage any signs of climate gentrification.
    - *Ensure equity and environmental justice to prevent disparate impacts to economically challenged sectors in planning*
  - Existing CCME Policy 11.5.3 (under separate cover)
    - *Require publicly funded projects to maximize energy efficiency, water conservation and limit taxpayer investments in vulnerable coastal areas*
  - The Planning and Development Department shall coordinate the Federal Emergency Management Agency's (FEMA) Community Rating System (CRS) program for the City of Jacksonville. The City shall strive to obtain a score of between four (4) and six (6). [Note: See related CCME Policy 11.3.6 (under separate cover)]
    - *Coordinate City personnel around obtaining a Community Service Rating (CSR) score of 6 (2019) to 4 by following the guidance for Open Space Preservation and Building Regulations*
- 4A. Funding options
- Existing CCME Policy 11.3.2 (under separate cover)
    - *Develop a priority list and funding source for buying out Repetitive Loss Properties (RLP), removing structures, and restoring land to its predevelopment condition*
- 4B. Prioritization
- 
- 4C. Scheduling/Timelines
- 
- 4D. Monitoring and evaluation
- Update the Adaptation Action Area for sea level rise and infrastructure vulnerability assessments every five (5) years so that decisions regarding adaptation planning and investments can be based on best available data.

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At the time of the update, the City shall consider creating focused shoreline adaptation plans, which may provide protection and preservation standards or strategies for undeveloped or reclaimed wetlands and floodplains, inclusive of buyout properties.

- *Create a Shoreline Adaptation Plan that develops standards for undeveloped and reclaimed wetlands and floodplains (including buyout properties) that maximizes protection and preservation. Include land acquisition for adaptation purposes (considering sea level rise, increase in frequency of severe storms, wildfire threat, loss of wildlife and fisheries habitat)*
- Existing CCME Policy 11.3.12 (under separate cover)
  - *Develop strategy to regularly update floodplain maps*

## **OTHER RECOMMENDATIONS**

- Organize marine biosphere reserves and protected areas for the habitat of marine mammals to maintain critical breeding grounds
- Promote reforestation and afforestation of marginal lands to increase soil moisture retention, provide shade and increase habitat for species under stress
- Remove invasive non-native vegetation from riparian areas
- Explore the benefits of forming a Northeast Florida Resiliency Compact, similar to the Southeast Climate Change Compact or Tampa Bay Resiliency Group. [Note – NEFRC]