

HILLSBOROUGH COUNTY  
COMMUNITY VULNERABILITY STUDY (CVS):  
**RECOMMENDED COMPREHENSIVE  
PLAN POLICIES  
FOR PERILS OF FLOOD  
IN HILLSBOROUGH COUNTY**

OCTOBER, 2020

DRAFT



Hillsborough  
County Florida



Hillsborough County  
City-County  
Planning Commission

# UNIVERSITY OF SOUTH FLORIDA

## FACULTY

### School of Architecture and Community Design

**Brian Cook**, ASLA, MLA, PLA (coordinating author)

Community Vulnerability Study Project Manager

Visiting Assistant Research Professor

School of Architecture and Community Design

The Florida Center for Community Design Research

**Taryn Sabia**, Ed.M., M. Arch, MUCD

Director and Research Associate Professor

School of Architecture and Community Design

The Florida Center for Community Design Research

### College of Public Health

**Joe Bohn**, Ph.D., MBA

Assistant Professor, Director, Community Engagement & Deputy Director, DrPH Program

USF College of Public Health

**Marie Bourgeois** Ph.D., MPH

Assistant Professor

College of Public Health

Center for Environmental/Occupational Risk Analysis and Management

**Elizabeth A. Dunn**, MPH, CPH

Instructor, I

Global Disaster Management,

Humanitarian Relief, and Homeland Security

College of Public Health

## GRADUATE ASSISTANTS

### Florida Center for Community Design and Research

Emilia Ribadeneira

William Cook

Ana Cheng

Margaret Winter

### College of Public Health

Carson Bell, MPH

William Gardner, MPH

Amy Polen

## Introduction

This report is associated with the Community Vulnerability Study (CVS), which was commissioned by Hillsborough County Department of Emergency Services, with project management assistance provided by the Hillsborough County City-County Planning Commission. A priority task for the project was to develop recommendations for comprehensive plan policy to meet, and possibly exceed, the requirements associated with Senate Bill 1094 (2015): Peril of Flood. The bill requires all municipalities to address six goals related to flooding. This includes (Brandes, 2015):

### Goal 1: Policy development to reduce coastal flood risk (mapping and planning)

*Include development and redevelopment principles, strategies, and engineering solutions that reduce the flood risk in coastal areas which results from high-tide events, storm surge, flash floods, storm water runoff, and the related impacts of sea-level rise.*

Examples of this in policy includes:

- “Current and credible sea-level rise data should be considered when evaluating future land use amendment applications.” (Madeira Beach) (Smith, 2017)
- Identify locations vulnerable to impacts of sea level rise. (Clearwater)
- Maintain shoreline protection and erosion control. (Clearwater)
- Post Disaster Redevelopment Plans (PDRP). (Treasure Island)
- Public information and outreach. (Treasure Island)

### Goal 2: Removal of coastal properties from FEMA flood zones (acquisition and constraints)

*Encourage the use of development and redevelopment principles, strategies, and solutions that will result in the removal of coastal real property from flood zone designations established by the Federal Emergency Management Agency.*

Examples of this in policy includes:

- “Acquisition of sever repetitive loss properties, which have sustained repeated flood losses for use as public open space shall be considered as procurement opportunities arise, such as through the use of grants or tax deed sales.” (Madeira Beach) (Smith, 2017)
- Control development within the coastal high hazard or floodplain areas. (Broward County)
- Maintain allowable permanent population densities. (Treasure Island)

### Goal 3: Site development techniques and best practices for reducing flood losses (mitigation)

*Identify site development techniques and best practices that may reduce losses due to flooding and claims made under flood insurance policies issued in this state.*

Examples of this in policy includes:

- Low Impact Development (LID) (Treasure Island)

- Principles, strategies, and engineering solutions to reduce flood risk in coastal areas. (Broward County)
- Utilize vegetation and natural features to minimize surface runoff and reduce flood risks. (Treasure Island)
- Open space preservation. (Treasure Island)
- Setbacks and buffers (Treasure Island & Broward County)
- Landscape retention areas (Treasure Island)

#### Goal 4: Construction requirements (building code)

*Be consistent with the flood-resistant construction requirements in the Florida Building Code and flood plain management regulations set forth in 44 C.F.R. part 60.*

Examples of this in policy includes:

- “Through implementation of the Land Development Regulations, the City will continue to be consistent with, and in some instances more stringent than, the flood-resistant construction requirements in the Florida Building Code and federal flood plain management regulations.” (St. Petersburg) (Smith, 2017)

Some of these criteria, within the Florida Building Code, include:

- Minimum first floor elevations for habitable space in residential and commercial buildings. (Broward County & Miami Beach)
- Buildings must be supported on piles, drafted shafts, caissons, or deep foundations.
- Stem walls supporting floor and backfilled with soil or gravel are allowed in Coastal A zones if designs provide for effects of local scour erosion
- Erosion control structures must not be attached to buildings or direct floodwater, increase flood forces, or erosion impacts on structures.

#### Goal 5: Coastal Construction Control Line (CCCL) and Florida Statute

*Require that any construction activities seaward of the coastal construction control lines established pursuant to s. 161.053 be consistent with chapter 161*

This in policy promotes:

- Preservation and protection of the beaches and coastal barrier dunes adjacent to such beaches
- Preservation of economic activity within the coastal storm area
- That activities seaward of the coastal construction line do not cause measurable interference with the natural functioning of the coastal systems.
- Maintenance of existing beach-dune vegetation

Communities do not need to address activities seaward of the CCCL since their jurisdiction does not touch the Gulf of Mexico. (Smith, 2017)

#### Goal 6: Encourage local governments to participate with the NFIP CRS

*Encourage local governments to participate in the National Flood Insurance Program Community Rating System administered by the Federal Emergency Management Agency to achieve flood insurance premium discounts for their residents.*

Examples of this in policy includes:

- “The City shall continue to participate in the Federal Emergency Management Agency’s National Flood Insurance Program and Community Rating System in order to achieve higher flood insurance premium discounts.” (St. Petersburg) (Smith, 2017)

The first three goals require analysis and action by the municipality. The last three can be accomplished by simply stating that they will be accommodated. The following policy suggestions for Hillsborough County are organized by topic rather than SB1094 Perils of Flood requirement. As such, Hillsborough County can integrate concepts into their plan as they see fit.

Other requirements of SB 1094 include a stipulation that surveyors/mappers must submit elevation certificate to Florida Division of Emergency Management within 30 days of completion and other rules for flood insurance (Smith, 2017).

#### **The Team**

In order to develop policy recommendations for Hillsborough County, an interdisciplinary team was assembled within the Florida Center for Community Design and Research at the University of South Florida, which worked in collaboration with County administration. This included faculty and graduate research students from the School of Architecture and Community Design and from the College of Public Health. Together, they conducted a study of vulnerabilities to flood, both generally and in Hillsborough County, of mitigation strategies, of previous comprehensive plan submittals for Perils of Flood, and worked with stakeholder groups to conduct workshops, meetings and to host presentations. The following policy proposals are the outcome of this process.

## Highlights from the Community Vulnerability Study

### Vulnerabilities in Hillsborough County

Hillsborough County's Local Mitigation Strategy (LMS) identifies hurricanes and storm events (flood) as its primary and most cost burdensome hazard (Hillsborough County, 2015). The Community Vulnerability Study (FCCDR, 2020) built on top of this understanding and provided a more in-depth analysis of impacts. This included an extensive mapping exercise to locate geographic concentrations of vulnerability to flood, in the built environment, to the population, or to ecological systems. These maps can be seen online at the County's Website (FCCDR, 2020). This survey of vulnerabilities, as an assessment, proved extremely useful in identifying areas of concern that are specific to Hillsborough County, both conceptually and geographically, to be addressed in future Local Mitigation Strategy development and also the policies proposed for the Comprehensive Plan.

A few of the main vulnerabilities in the County include (FCCDR, 2020):

- The port areas, and other areas of industry in proximity to the coastal high hazard area and the bay, including those used for mining
- Concentration of resources, such as commerce, hotels and cultural facilities (such as art and other museums) in the coastal high hazard area.
- Density of residential populations within a category 3 storm surge range (for the year 2045)
- Hospital facilities, especially with tier 1 service
- Deficiencies for evacuation and sheltering
- Water treatment facilities
- Energy facilities, and their byproducts
- Access to transportation alternatives, especially for evacuation purposes
- Limited peripheral support, including housing, hotels and other emergency services, to main population centers
- Loss of wetlands
- Loss of oyster habitats
- Sea walls
- Low income populations in older (pre-Florida Building Code) housing
- Future development impacts in the southern part of the county, including capacities for emergency services and response

When considering policies to address these risks, FEMA has provided guidance suggesting that plans and policies related to resiliency are most successful when incorporated as core factors of community planning and operations, in addition to targeting specific objectives involving risks and hazards (FEMA, 2013). They suggest preparing strategies that meet basic community needs while at the same time

integrating long-term risk mitigation and environmental hazard concerns; the two should be mutually addressed and part of the same vision.

### **Integrating Flood Policy into the Comprehensive Plan**

FEMA's document, *Integrating the Local Natural Hazard Mitigation Plan into a Community's Comprehensive Plan. A Guidebook for Local Governments* (2013), explains the importance of both the comprehensive planning process and for coordinating resiliency issues throughout government administration roles and policies. For example, they suggest that the *process* of planning and discovering vulnerabilities allows the community of participants to become informed and ultimately support decisions to mitigate risk (FEMA, 2013; Palma-Oliveira et al., 2017). This coordination can be seen as resiliency strategies are going beyond the initial mandate of SB 1094 for Perils of Flood, which required the six goals to be addressed in the Redevelopment Component of the Coastal Management Element of the Comprehensive Plan (Brandes, 2015). Instead many communities are dispersing policies through their overall Plan, through many sectors of governance.

### **Plan Organization**

Goals, objectives and policies, whether for the Perils of Flood Act or otherwise, are placed into a series of 'Elements.' Through a literature review of plans, this study found that, typically, the following Elements most always contain policies directly related to flood:

- The Coastal Management Element
- The Future Land Use Element
- The Conservation and Aquifer Recharge Element
- The Potable Water Element
- The Water Management Element

In addition, most counties in our study included objectives and goals related to flood in these elements:

- The Housing Element
- The Intergovernmental Coordination Element
- The Stormwater Management Element
- The Capital Improvements Element
- The Conservation Element
- The Recreation and Open Space Element
- The Public Facilities Element

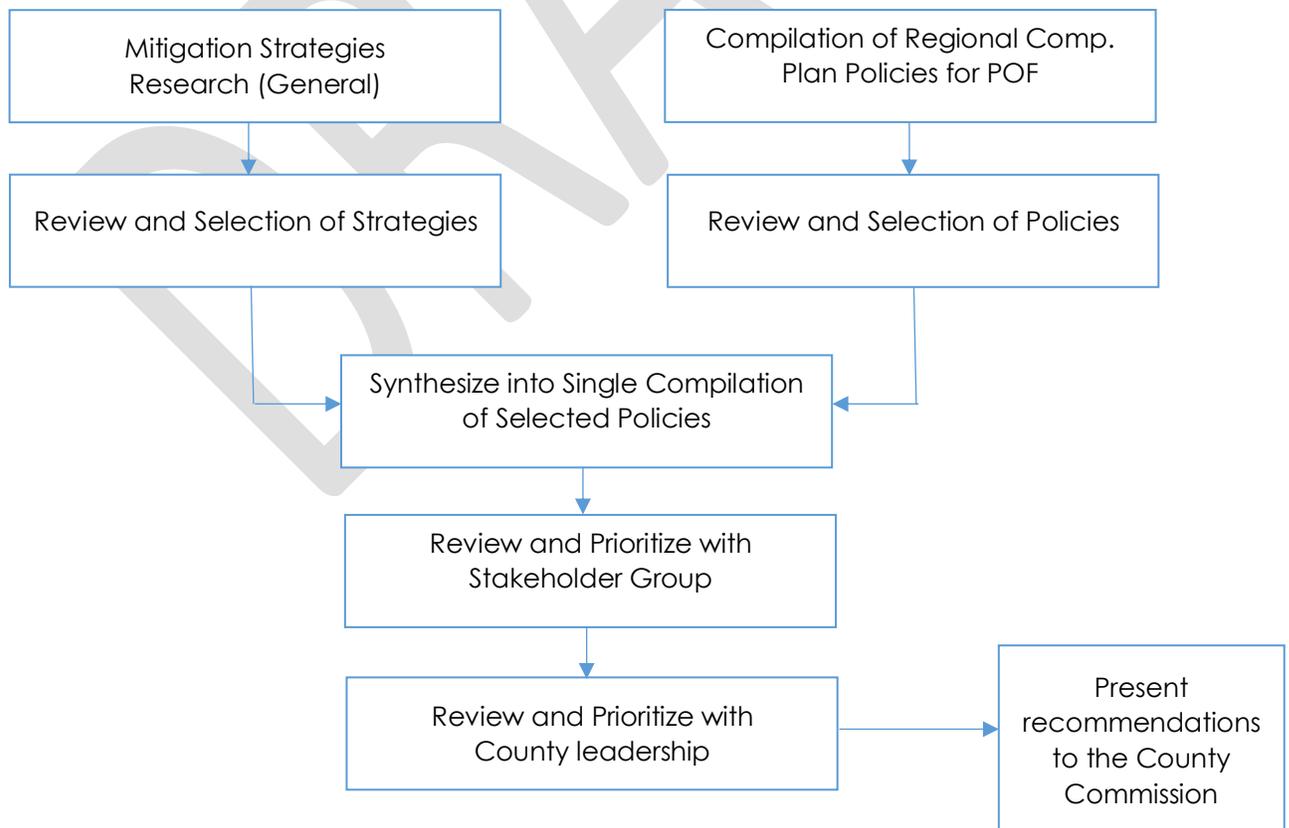
Some communities have opted to create special sections to meet the challenges imposed by flood. These include:

- The Climate Change Element (Broward)

- The Natural Disaster Component (Broward)
- The Hurricane Safety Element (Sanibel)
- Other Human Support Systems (Sanibel)
- The Historic Preservation Element (St. Petersburg)

## Next Steps

This document represents the culmination of research, workshops and meetings with staff. The proposed policies were determined to meet Perils of Flood criteria and be consistent with a specific level of commitment. Reference documents, included in the appendix, provide the backdrop for this decision-making process and show a more expansive list of options, and other policy language used by communities in Florida. The first document, the Matrix of Comprehensive Plans (2<sup>nd</sup> edition), synthesizes policies that are already integrated into plans from other municipalities. This document also shows the Perils of Flood goals that are being met. The second document shows a broad range of mitigation strategies, which includes physical, social, ecological and governmental actions that can be taken to create more resilient communities. These secondary lists can be used as a resource if administrators are interested in comparing proposed policies in this document to a more broad set of options, or to compare language and levels of commitment.



*Diagram showing the Community Vulnerability Study process to develop comprehensive plan recommendations for SB 1094: Perils of Flood*

## Recommended Policies

The existing Hillsborough County Comprehensive Plan already contains policies that help to meet Perils of Flood requirements. Those policies are shown in italics and include abbreviated references as shown below:

*Capital Improvement Element (CIE)*  
*Coastal Management Element (CME)*  
*Future Land Use Element (FLUE)*  
*Conservation and Aquifer Recharge Element (CARE)*  
*Recreation and Open Space Element (ROSE)*  
*One Water (OW)*

Text has been underlined where added to existing policies

A workshop was held January 30, 2020 with County staff and regional collaborators to prioritize strategies for flood hazards. Those policies are noted as:

\*\* Items with asterisk are strongly recommended for prioritization

**\*\* Items that are bold with asterisk are noted as highest priority**

**The following polices are recommended to address the requirements of SB 1094:**

### Mapping and Inventory

#### General

1. Support local and regional mapping, modeling and monitoring programs to assure the most current and locally-specific data on climate change vulnerability and sea-level rise is available. This includes impacts on groundwater levels, saltwater intrusion, and drainage infrastructure.
2. \*\*Establish guidance and criteria for planning, to include sea-level rise projections as established by the Tampa Bay Regional Planning Council and the Climate Science Advisory Panel.
3. Flood elevation certificates shall continue to be made available to the public and will be digitally entered into a geographic database to aid with assessment and other resiliency efforts.

#### Specific Sites

1. Continue to identify locations vulnerable to the impacts of sea level rise and climate change.
2. Identify and evaluate public infrastructure and structures that are at high risk to potential sea level rise and frequent storm surge and flood events; including but

not limited to: public buildings and facilities, including police and fire stations; water and water reclamation facilities; stormwater management and drainage; pumping stations and transmission lines; roads and bridges; and other transportation and transit infrastructure.

3. **\*\*Identify water infrastructure at risk from coastal flooding, sea level rise, and saltwater intrusion, such as surface or subsurface storage facilities, control structures, water and wastewater treatment plants, and update this assessment every 5 years.**
4. Continue an urban forestry study and update every 5 years. Evaluate for flood mitigation economic value and hydrologic importance.
5. **\*\*Develop priority areas for land acquisition based on their strategic capacity to absorb floodwaters and support coastal ecosystem migration in order to reduce loss to flooding.**
6. Consider developing overlays that pertain to sea-level rise or other storm-flood vulnerabilities, such as Adaptation Action Areas, or a vulnerable areas overlays such as zones for protection, accommodation or managed relocation, based on the landward extent of projected sea level rise impacts. Such areas may include policy related to increased design flood elevations, clustering of development or other flood mitigation strategies.

## **Future Development**

### ***Planning Approvals, Reviews and Standards***

1. **\*\*Site plan review criteria shall consider location, site design, land use types, density and intensity of uses, landscaping, and building design for impacts or potential mitigation effects from sea-level rise and other future flood hazard scenarios. Reviews shall also consider evacuation levels and sheltering in a comprehensive manner. For development projects located on a shoreline, encourage analyses to demonstrate that the development will remain fully functional for its intended use based on sea-level rise projections presented by the Climate Science Advisory Panel of the Tampa Bay Regional Planning Council. (an update to CME 6.2)**
2. Strongly discourage plan amendments that would place additional residential and non-residential development at risk of flooding from sea-level rise.
3. Promote the clustering of development and the transfer of density/intensity of uses to increase contiguous pervious surface, in order to address flood impacts. (refer to CARE 5.3)
  - a. **\*\*Seek to reduce parking area and encourage shared parking**

## **Coastal High-Hazard Area (CHHA), Limitations and Restrictions for Public Facilities and Infrastructure**

The Coastal High Hazard Area (CHHA) is an area particularly vulnerable to the effects of coastal flooding from tropical storm events and is defined by section 163.3178(2)(h)9, Florida Statutes, as the area below the elevation of the category 1 storm surge line as established by a Sea, Lake, and Overland Surges from Hurricanes (SLOSH) computerized storm surge model.<sup>1</sup>

1. Explore and evaluate alternative locations prior to locating public facilities within the CHHA.
2. Consider sea-level rise when making decisions to accept new roadway maintenance responsibilities.
3. *Publicly funded infrastructure shall not be constructed within the coastal high hazard area or in areas likely to be subject to the impacts of sea level rise unless for use or facility as allowed in the Capital Improvements Element of the Comprehensive Plan (adds sea-level rise to CIE 1.5.A, CME Objective 10).*
4. The County shall not build infrastructure to promote development densities in the CHHA greater than what is currently shown in the Future Land Use Map.
  - a. Strategy: Shall not locate water line or sewer extensions, beyond that which is necessary to service planned densities as currently identified.
  - b. Strategy: Shall not install new roadway lane miles on the functionally-classified network within the CHHA unless required for evacuation purposes or to address planned development under the Future Land Use Element. Upgrades to existing roadways is limited to intersection improvements for safety reasons, accommodation of cyclists and pedestrians or to technological improvements that facilitate evacuation and maintain or improve evacuation clearance times.
5. Consideration shall be given to relocating existing public facilities outside the CHHA.
6. **\*\*The County shall encourage, through the subdivision regulations, that all new construction of utility lines, or as improvements are made to utility lines, be placed underground to increase community resilience during storm events and to encourage environmental benefits of tree canopy for shade and dissipation of rain water. This requirement shall be subject to all other restrictions in this section. (CME 6.5 addresses this policy in the CHHA)**

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<sup>1</sup> Florida Department of Economic Opportunity, 2020

### **Coastal High-Hazard Area (CHHA), Limitations and Restrictions for Private Development**

1. Consider opportunities to decrease residential development potentials on the remaining vacant tracts in the CHHA through plan amendments to less intensive uses through land purchase or transfer of development rights.
2. *Plan amendments or density bonuses that increase residential density in the CHHA are prohibited. (FLUE 10.6)*
3. Prohibit the development of new mobile home projects within the Coastal High Hazard Area. (Existing policy says *unless they meet the standards of the Florida Building Code. FLC Sec. 6.11.110.F*)
4. Promote programs for sellers of real property within the CHHA to provide notice to purchasers that structures or properties are located within a hazard overlay area.
  - a. Strategy: Show the 1% flood line on all real estate transactions
  - b. Strategy: Sellers of real property shall provide notice to purchasers if structures and properties have been affected by flooding

### **100 Year Floodplain, Limitations and Restrictions**

1. Review the efficacy of requiring that all new structures built in the 100- year floodplain include at least 2 foot freeboard elevation.
2. *The County shall continue to prevent net loss of 100-year floodplain storage volume in Hillsborough County. The County shall continue to protect and conserve natural wildlife habitat attributes where they exist within the 100-year floodplains of major rivers and streams (CARE 1.5.0)*

### **25 Year Floodplain, Limitations and Restrictions**

1. Prohibit habitable structures and major public and private investment within the existing/pre-development 25-year flood plain, except where a finding of overriding public interest has been reached by the Board. This policy shall not preclude the development of water-dependent uses, water-related and water-enhanced uses, stormwater management structures, non-habitable structures, and passive recreational uses where appropriate.

### **Healthcare**

1. Prohibit new hospitals, nursing homes and assisted living facilities in the Coastal High Hazard Area and discourage the siting or expansion of hospitals or nursing facilities in Evacuation Level B zones

## **Hazardous Sites**

1. **\*\*Ensure the risk of existing contaminated lands is addressed in appropriate planning efforts including the Local Mitigation Strategy and Post Disaster Redevelopment Plan.**
  - a. **\*\*Strategy: Mitigate risk from coal ash, as a primary toxicity in the region**
  - b. **\*\*Strategy: Provide buffers between toxic sites, such as industrial and waste treatment facilities, and residential communities or important environmental sites.**
2. *No new sites shall be permitted for heavy industrial uses along the shoreline of the coastal area unless such uses are water-dependent or water-related, or unless an overriding public interest is demonstrated. (CME 7.6)*
3. *No new solid waste or hazardous waste management sites shall be approved for location in the coastal high hazard area. (CME 13.8)*

## **Mitigation and Construction**

### **Capital Improvements and Major Infrastructures**

1. Consider the risk of sea-level rise over the life expectancy of capital improvement projects and identify strategies to ensure resilience.
2. Seek multiple community objectives in project development and capital improvement projects, including but not limited to hazard mitigation, resiliency and climate adaptation.
3. Encourage power generation facilities and power transmission infrastructure be sited and designed in a manner which takes into consideration impacts from climate change, including increasing winds, storm surge, ambient temperatures and sea-level rise.
4. **\*\*Continue to prioritize critical infrastructure and hazard mitigation projects through planning efforts including, but not limited to, an assessment of vulnerabilities and mitigation projects through the Local Mitigation Strategy**
5. *Public lands shall be efficiently used by combining public service activities, such as recreation, stormwater management and aquifer recharge areas and linking them into the greenway system, wherever possible. (ROSE 4.2)*

### **\*\*Expand the Use of LID Principles in the Built Environment**

1. **\*\*All wetland mitigation projects must restore the ecological values provided by the functions performed by impacted wetlands and other surface waters. (CARE 4.9)**
2. *Many others are found in One Water under Objective 6.1*

## Acquisition and Removal

### Repetitive Loss Properties

1. Provide planning and technical assistance to communities in hazardous or repetitive loss areas.
2. Maintain an inventory of repetitive loss properties and target hazard mitigation programs to these properties.
3. *Reduce repetitive (flood) loss properties, through methods such as at risk property acquisition or elevation, as feasible. (CARE 5.4) Encourage the use of best practices development and redevelopment principles, strategies, and engineering solutions that will result in the removal of coastal real property from flood zone designations established by FEMA.*
4. Seek funding for the acquisition of abandoned properties and undeveloped land in the coastal areas for increased passive recreation, open space and restoration to its natural state. This can include the utilization of programs such as the Flood Mitigation Assistance Program (FMAP), Repetitive Flood Claims (RFC) and Severe Repetitive Loss (SRL), work with the State of Florida Division of Emergency Management (DEM), the Federal Emergency Management Agency (FEMA) and the National Flood Insurance Program (NFIP).

## Evacuation and Sheltering

### Policy

1. Utilize the most current Tampa Bay Region Hurricane Evacuation Study when determining if proposed development or redevelopment will cause roadways to fall below acceptable level-of-service standards for hurricane evacuation and if sheltering needs are met.
2. *Future development within the Coastal High Hazard Area shall not occur in a manner that would cause total evacuation times to exceed those established by the County. (CME)*
3. Whenever possible, new or expanded county buildings shall be located, designed, and constructed so that they may be utilized for hurricane shelters.
4. Prioritize roadway maintenance and construction projects on evacuation routes.
5. **\*\*Support diversified modes of transportation infrastructure to aid in evacuation and resiliency.**
6. Ensure that sheltering needs are met
  - a. Strategy: Assess sheltering needs and use to evaluate current inventory of facilities.
  - b. Strategy: Consider special needs and pets
  - c. Strategy: Locate major public and community facilities in safe areas and retrofit to emergency standards, where feasible

- d. Seek funds through planning and mitigation grants to identify and upgrade important community buildings to sheltering standards, as feasible
7. **\*\*Ensure all areas of the county meet level of service standards for evacuation access** (refer to CME, especially Policy 6.2, which says: New development within the coastal high hazard area shall continue to be subject to the applicable site plan review process. As a component of the review process, the property owner shall provide adequate data to assess the impacts of the proposed development upon existing infrastructure within the Coastal High Hazard area, as well as level of service standards established for shelter capacity and clearance times.)

### **Post Disaster Planning**

1. Continue to use the Post-Disaster Redevelopment Plan (PDRP) to reduce or eliminate the future exposure of life and property to hurricanes.
2. Encourage post-disaster redevelopment in areas with less vulnerability to storm surge, inundation, flooding, sea level rise and other impacts of climate change, and encourage locally appropriate mitigation and adaptation strategies.
3. Redevelopment shall effectively addresses existing and potential flooding problems when within identified floodplains and low-lying areas subject to tidal inundation and/or sea level rise, as identified on the Flood Plains, Flood Prone Areas, and Coastal High Hazard Area Map.

### **Recovery and/or Improvements**

1. Structures with damage exceeding 50 percent of pre-storm market value or that are substantially improved shall be reconstructed to ensure compliance to all applicable codes and regulations, including the High Velocity Hurricane Zone portion of the Florida Building Code for structures located in the "V" and "Coastal A" Zones and for others in the A zone or the 100-year floodplain. *(This is written into The Hillsborough County Construction and Land Development Codes, however it was agreed to make this a comprehensive plan policy)*
2. When public infrastructure within the coastal storm area is destroyed or receives damage that equals or exceeds 50 percent of the cost of replacing the facility at its current location, the County shall analyze the feasibility of relocating this infrastructure landward of the CHHA.

## Shoreline Stabilization and Sea Walls

1. Work with the Estuary Program and regional partners to explore the feasibility of replacing hardened shorelines with natural shoreline stabilization methods.
2. *The County will continue to preserve natural shorelines and reverse the trend toward hardened shores and channelization along rivers and primary tributaries. The County shall enforce a shoreline construction controls as provided by the Tampa Port Authority and state statute to address shoreline conservation. (refer to CARE Objective 21)*
3. **\*\*Encourage shoreline softening through vegetative projects, submerged vegetation and living shorelines in order to minimize flood damage, stabilize the shore, and maintain adaptability to future sea-level rise conditions. Also encourage naturalization of shorelines in front of or in place of hard shoreline stabilization structures, as feasible**
4. **\*\*Incorporate living coastlines into storm surge reduction projects, as feasible.**
  - a. **Strategy: Support regeneration of oyster reefs**
  - b. **Investigate and evaluate the effectiveness of living breakwater systems**
5. Minimize the disturbance of natural shorelines that provide stabilization and protect landward areas
6. *Publicly-owned or controlled lands shall continue to be improved by the restoration of vegetated riverbanks, including the gradual replacement of deteriorated seawalls and rip-rap with native vegetation. (CARE 21.2)*
7. *Support the elimination of vertical seawalls and replacement with natural slopes and wetland vegetation along the river banks as existing bulkheads are repaired or replaced. (CARE 27.2)*
8. *Channelization or hardening of natural coastal shorelines and tidal creeks shall be prohibited except in cases of overriding public interest. (CME 2.2)*
  - a. *Where the maintenance and or alteration of existing hardened shoreline is allowed, the County may require mitigation of environmental impacts. Such mitigation may include, but is not restricted to, the installation of rip-rap. (CME 2.3)*

The County's current approach to sea walls can be found in the existing Coastal Management Element:

*Shoreline Protection Structures: Seawalls are the primary man-made coastal protection structures in the County. The remainder of the shoreline in the coastal planning area is comprised of beaches and naturally vegetated areas. To date, a comprehensive inventory of seawalls has not been completed for the County. Routine maintenance and redevelopment are accorded to both private interests and the County. It is recommended that repairs and reconstruction of any seawalls should be consistent*

*with the standards required under Chapter 61B-33 (now 62B-33), Rules and Procedures for Coastal Construction and Excavation (FDEP, Division of Beaches and Shores).*

### **Building Code**

1. Conform all development to Florida Building Code. This includes flood-resistant construction requirements in the Florida Building Code and applicable floodplain management regulations set forth in 44 C.F.R. part 60, or more stringent controls, shall continue to be applied to development and redevelopment in the coastal storm area.
2. Require all development within the 100 year flood plain to be in strict conformance with all applicable federal, state, regional and local development regulations.
3. Implement building codes and development regulations, such as risk-based setback provisions, structural connections, and other site control and overlay zones, to reduce future property damages and losses.

### **Design Flood Elevations**

1. Consider amending freeboard requirements to address flooding and sea-level rise and flood resiliency for the life expectancy of structures.

### **National Flood Insurance Program**

1. Participate in the NFIP program, including the CRS, assist local municipalities who participate and make all reasonable efforts to maintain a Community Rating System (CRS) score of 5 or better.

### **Education**

1. **\*\*Continue outreach about BMPs and LID practices, to increase knowledge of construction techniques and permitting requirements.**
2. **\*\*Provide guidance for home and small business preparation for hurricanes and flood events.**
3. Educate residents about flood risk and create programs to reduce flood hazard by sharing relevant information.

### **Long Term Recommendations, Related to Perils of Flood**

This section outlines potential longer term policy initiatives. These policies are not necessary to immediately address the requirements of SB 1094, but can serve to enhance resiliency in the county. While acknowledging the time constraints in

developing and approving comprehensive plan policies for this current amendment, the project proposes the following policies be considered in the future:

1. Create a vulnerable area overlay based on the landward extent of projected sea level rise impacts over a selected planning horizon. Plan areas would include:
  - a. SLR Adaptation Overlay Protection Zone
  - b. SLR Adaptation Overlay Accommodation Zone
  - c. SLR Adaptation Overlay Managed Relocation Zone
    - i. \*\*Prioritize and seek to acquire properties or interests in properties within the managed relocation zone based on their relative vulnerability to SLR and the extent to which they may impede coastal ecosystem migration
    - ii. Promote the acquisition of rolling conservation easements within the managed relocation zone
  - d. Require all sellers of real property within the SLR Overlay Districts to provide notice to purchasers that structures and properties are located within an area that is vulnerable to sea level rise within the planning horizon.
2. Future land use maps will show all land located within the Velocity Zone and the Coastal A Zone, as designated by the Federal Emergency Management Agency.
3. \*\*Require Low Maintenance Zones (LMZ) to be established between developed areas and shorelines, contiguous to any pond, stream, watercourse, lake, wetland or seawall, to reduce impacts of climate change and the negative effects of storm surge and tidal velocity, and the erosive effect of wave action.
4. \*\*Protect and improve existing inland wetlands
  - a. Strategy: Prohibit removal, alteration, or encroachment within wetlands except in cases where no other practical alternatives exist that will permit a reasonable use of the land or where there is an overriding public benefit
  - b. Strategy: Protect wetlands and watercourses from land development activities by requiring the establishment of natural area buffers adjacent to all post-developments and watercourses within a watershed overlay
    - i. Require Low Maintenance Zones (LMZ) to be established between developed areas and shorelines, contiguous to any pond, stream, watercourse, lake, wetland or seawall, to reduce impacts of climate change and the negative effects of storm surge and tidal velocity, and the erosive effect of wave action.
  - c. Establish riparian buffers that reflect projected rates of sea level rise within the planning horizon for all tidally influenced water bodies. Such buffers shall be designed to allow the conversion of adjacent uplands to wetlands while retaining transitional ecotones where ecologically feasible

5. **\*\*Create littoral edge standards for lakes and ponds, beyond those required by the Southwest Florida Water Management District**
  - a. Require stormwater management facilities and systems to be designed to preserve the valuable ecological functions of the natural drainage system
6. **\*\*In multi-family buildings in high-risk flood zones, include secure gathering/ sheltering space for sheltering in-place, with backup potable water**
7. Create a citizen plan-implementation steering committee to monitor progress on local mitigation actions
8. Minimize grading and compaction of sites during construction
9. **\*\*Create events to familiarize citizens with environmental hazards and response, such as evacuation routes**
10. **\*\*Restore hydrologic function in the ecosystem**
  - a. **\*\*Widen and soften creek or river corridors that have been hardened and/or straightened**

## **Recommended Resiliency Policies for Hillsborough County**

The focus of this document is to recommend policies to meet Perils of Flood criteria. However, the research associated with the Community Vulnerability Study suggests the following policies would also be beneficial for overall resiliency in Hillsborough County:

1. Address disadvantaged and vulnerable populations in hazard mitigation planning and development.
2. **\*\*Equitable access to transportation options, including during evacuation, is important for keeping our populations safe, especially for those that are transportation disadvantaged. Coordinating transportation and land use is another step that can encourage growth patterns that include commercial and emergency services in peripheral, safe areas outside of the flood zones.**
  - a. Strategy: Utilize resiliency funding to strengthen multi-modal connections and planning.
  - b. Take advantage of historically dense commercial areas, especially those connected by rail.
3. Provide safe and familiar sheltering options within communities, as feasible
4. **\*\*Promote development in appropriate areas where government services and infrastructure is concentrated.**
5. **\*\*Create redundancies for critical infrastructures, where practical**
  - a. **\*\*Supply back-up power for critical facilities**
  - b. Explore micro-grids for specific planning areas within the county
6. Make hazard information easily accessible by way of illustrative website design and documentation. Develop and promote a well-curated online library of regionally consistent, rigorous and multilingual communication resources for use by local governments, associations and other stakeholders

7. Incorporate preparedness planning into local education curriculum
8. **\*\*Establish a multi-disciplinary quality review team, with a focus on integration and design for capital improvement projects within the County**
9. Establish neighborhood-level planning groups and representation
10. Work at the community or neighborhood level to evaluate hazards and mitigation strategies
11. **\*\*Create programs for older homes to meet 2002 Florida Building Code, especially for lower income residents**
  - a. Explanation: Pre-2002 homes are shown to have significantly more hurricane damage
12. **\*\*Hold landlords accountable for securing their residents from the impacts of hurricanes and flood damage**
13. **\*\*Amend parking code to eliminate parking minimums**
14. Reduce daily vehicle miles traveled
15. **\*\*Set goals and monitor results for the elimination or calculated reduction of fossil fuel dependency**
16. Be part of a larger effort to reduce carbon emissions.
  - a. Encourage the use of green and cool roofs.
17. Consider that new facilities, and new improvements to existing facilities, that will be constructed with County funds shall be designed, constructed, operated, and maintained according to standards outlined by a recognized sustainable development rating system (such, as but not limited to, the U.S. Green Building Council's Leadership in Energy and Environmental Design, "LEED"), and/or are proven to be economically feasible using a cost benefit analysis of proposed projects.
18. Support job creation in the field of resiliency, or that pertain to specific hazards
19. Support efforts to provide high levels of education and to retain local population
20. **\*\*Work with food pantries to ensure food and water delivery in post-disaster situations**
21. Incorporate ecosystem services into financial models
22. Create or support programs to remove invasive species, especially after a hurricane or other extreme weather events
23. **\*\*Establish a methodology to guarantee equity and fairness in any mitigation efforts**
24. **\*\* Coordinate planning across government agencies**
25. Support research as climate change data and mitigation strategies evolve
26. Inspect permitted land development and construction sites during all phases of construction and post construction for compliance with required erosion and sediment control plans.
27. Include cultural facilities in hazard mitigation planning

28. Consider the Tampa Bay Estuary Program Habitat Restoration Best Management Practices Manual, Habitat Masterplan and Comprehensive Conservation and Management plan in planning practices and policy making.
29. Maintain or increase the acreage of habitat for threatened and endangered species populations due to sea level rise, as feasible.
30. *New development and nonresidential and nonagricultural redevelopment/ expansions shall meet water quality standards and shall have a runoff rate, duration, volume and pollutant load that is substantially similar does not exceed ~~to that for predevelopment conditions, except in concentrated urbanized areas where a regional approach may apply.~~ (OW 1.1.7)*
31. *The County, in cooperation with the USDA Soil Conservation Service, shall require that topsoil best management practices be observed during all land alteration activities. ~~To the greatest degree practicable,~~ Erosional soil loss due to construction and agricultural activities shall be minimized. (refer to CARE 12.2)*
32. *\*\*Where present, existing sensitive natural areas ~~on lake shorelines~~ shall be retained in as natural a state as feasible. Minimal encroachment for physical access to the water shall be permitted, such that the landowner retains reasonable beneficial use of the property without degrading the lake's existing environmental quality. ~~Developmental activities should be compatible with the adjacent natural or built environment and sensitive to the need to provide maximum natural/open space proximate to the lake.~~ (refer to CARE 6.4)*
  - a. Strategy: Establish and monitor defined zones of regulatory protection during and after construction.
33. *CME Policy 2.7: The County shall prohibit ~~unmitigated~~ development activities on submerged lands containing significant seagrass habitat, and shall seek to restore seagrass coverage, except for where there is overriding public interest or value.*

## Conclusion

For further consideration of mitigation opportunities, the Florida Center for Community Design and Research has compiled their literature review into a guidebook document, *The Flood Mitigation Handbook (2020)*. This document, and others associated with the Community Vulnerability Study, will be hosted on the Tampa-Hillsborough Planning Commission website. Other questions or comments can be directed toward the project manager Brian Cook at [brianraycook@usf.edu](mailto:brianraycook@usf.edu).

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