

# LAKE MARIA SANCHEZ

## *Adaptation Strategy Proposal*

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Dear stakeholders for City of St. Augustine:

This proposal prepared by the Hail Mary Consulting Group from the University of Florida Sea Level Rise Course 2018 contains suggestions and adaptations to accompany the Flood Mitigation Project for Lake Maria Sanchez proposed by the City of St. Augustine.

Suggestions for the city include:

- A road diet for either Cordova Street or St. Francis Street
- Addition of a living shoreline to the proposed bulkhead south of Lake Maria Sanchez
- Extension of pipes to carry water away from the vulnerable intersection of Cordova and St. Francis Street
- The use of photogrammetry to document details of historic structures in the area for preservation purposes
- Communication strategies for relaying details of the Flood Mitigation Plan to residents
- Consideration for creating an adaptation action area
- Language revision in the city's code
- Additional requirements for HARB board members

Hail Mary Coastal Consulting draws on the experience of each team member to bring your city the most applicable suggestions to help the Lake Maria Sanchez area address key concerns.

Respectfully,

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# EXECUTIVE SUMMARY

The Lake Maria Sanchez project area has been identified by the City of Saint Augustine as an area that experiences flooding during King Tides, heavy rainfall, and especially severe weather such as hurricanes and tropical storms.

These flooding issues have only been exacerbated in recent years due to rising sea levels. In September 2018, Hurricane Irma caused water levels to reach record highs. Due to the low elevation of the area surrounding Lake Maria Sanchez, water was unable to drain from the area for many weeks.

Saint Augustine is in the process of implementing a flood mitigation plan, specifically in the area of Lake Maria Sanchez, this plan includes proposals for pumps to be added to the perimeter of the lake, as well as a bulkhead along the salt marsh just south of the lake.

The flood mitigation project drafted by the city's engineers is thorough and thoughtful in its design. There are a few areas of the city's proposed project our group recognized as possible candidates for enhancement. These suggestions are made with the intent to ensure the city's flood mitigation project is not only successful, but also as durable as possible. These mitigation project has a positive impact to the city but not an effective communication strategy. This proposal also offers suggestions to address the communication aspects of the plan implementation.

Our team realizes sea level rise will continue to evolve and change the way the city of Saint Augustine operates on a day-to-day basis, and the suggestions included in this proposal are meant to help the city to evolve and stay ahead of problems caused by coastal water rise.

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# INTRODUCTION & BACKGROUND

If you happen to visit Flagler College in historic downtown Saint Augustine and head south along Cordova Street, you will eventually run into the Lake Maria Sanchez Project Area (LMS Project Area). The north end of the project area is recognizable not only by the waters of Lake Maria Sanchez, but also by a concrete wall at the intersection of Cordova and St. Francis streets.

Perhaps surprisingly, this bland, beige structure has become something of a tourist destination within a city known for its architectural extravagances. But it is not really the wall people come to see. It is the graffiti. The waterline from Hurricane Irma is tattooed on the wall in black marker, a remarkable 45 inches (approximately 3.75 feet) above the roadway (Figure 1). The marker appears as both a bleak memorial of the damage wrought by Irma and as a challenge to the residents of Saint Augustine.

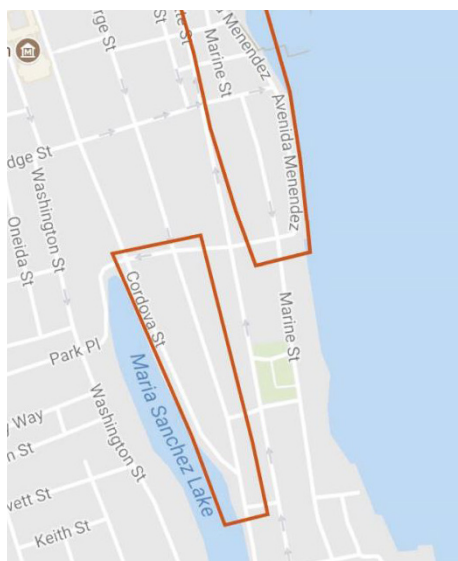


**Figure 1. Mark of water elevation from Hurricane Irma at the intersection of Cordova and St. Francis streets.**

As the entry point to the LMS Project Area, the graffiti is perhaps also a fitting beginning for a case study evaluating how city officials and community members in one small section of the Florida coastline are adapting to a changing climate.

## Description of Site

The LMS Project Area encompasses a small section of Saint Augustine's Old City neighborhood. Lake Maria Sanchez was not, it turns out, always a lake. In fact, it used to be a creek that stretched up to Flagler College. However, in the 1880s, at the direction of Henry Flagler, developers filled in the land to make way for buildings including the Ponce de Leon and Alcazar.



**Figure 2. Study site limits**

The neighborhood itself is bounded by Lake Maria Sanchez and Cordova Street to the West, St. George Street to the East, and St. Francis Street to the North (Figure 2). A mix of Historic Preservation and Single-Family Residential zoning, the homes within the project area have retained much of the architectural charm associated with the nation's oldest city.

## Significance of the Site

### Protection value

- Historic value. The diversity of styles, architectural complexes, records a mass of historic information about the production and living of human beings, is the witness of the historic change, and is the exhibition of historic development patterns
- Scientific value. The architectures in the street have unique features on construction level reflected by structure, technology, material, etc., which provides an important case for researching the contemporaneous scientific and technical level at that time.
- Artistic value. The elevation characteristics and detail decoration of the architectures in the area are of unique features with rich artistic connotation, which reflects the aesthetic quality of local residents.

## Residential value

The cultural orientation of residence becomes an important measuring standard of lifestyle.

## Economic value

It is important for the integrity of the historic district, to some extent it contributes to the flourish of the tourism. As the household incomes of the core St. Augustine market are normally distributed with 60% of visitors having incomes that fall between \$50,000 and \$150,000.

### *Project Area Concerns*

Few of the homes in the project area suffered the extensive flooding damage experienced in other sections of the city during hurricanes Matthew and Irma. However, the area is not without its challenges. Of particular concern in the project area is the intersection of Cordova and St. Francis streets which routinely experiences nuisance flooding (Figure 3).



**Figure 3. Nuisance flooding at the intersection of Cordova and St. Francis Streets.**

**Source: Street View from Google Maps.**

The flooding is the result of a number of factors including historical development decisions, inadequate drainage infrastructure, and a large neighboring waterbody. All of which are compounded by rising water levels and more intense and frequent storm events.

Additionally, St. Augustine is a low-lying coastal area, with elevations that range from 3 to 10 ft above mean sea level. Water elevations in low-lying coastal areas remain higher due to the minimal terrain slope. The flooding frequency increases with sea level rise. Based on water level measurements from 1928 to 2017, recorded at the tide gauge at Mayport, FL, the relative sea level trend is 0.86 ft in 100 years.

### *Flood Mitigation Project*

The city of Saint Augustine is taking significant steps to address these issues. A way to address the increased flooding in the city during storm events and/or high tides, is by the proposed Lake Maria Sanchez Flood Mitigation Project. This project will serve 175 acres of downtown core with the financial aid of a Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant. Highlighted improvements included with the project are: a stormwater pump station to be used under extreme weather events, instal valves to prevent backflow, road improvements (Cordova, Granada and Bridge Streets) and a bulkhead for the low lying area south of Lake Maria Sanchez, by South Street.

### *Looking Forward*

The proposals developed in this report for the LMS Project Area are not designed to operate in a vacuum. Rather they are potential overlays to the comprehensive work the city of Saint Augustine is already doing. Our proposals include:

- Road Diet of St. Francis Street
- Living Shorelines
- Extension of Stormwater pipes along Cordova street
- Structure-level elevation of Historic Residences

The community — including long-time residents, snow-bird tourists, and even century-old historic structures like the Castillo de San Marcos — is threatened by sea level rise. Our hope is that these suggestions provide another tool in the toolbox as decision-makers work to adapt one of our nation's most beautiful and culturally significant cities to a rapidly changing environment.

# PROBLEM STATEMENT

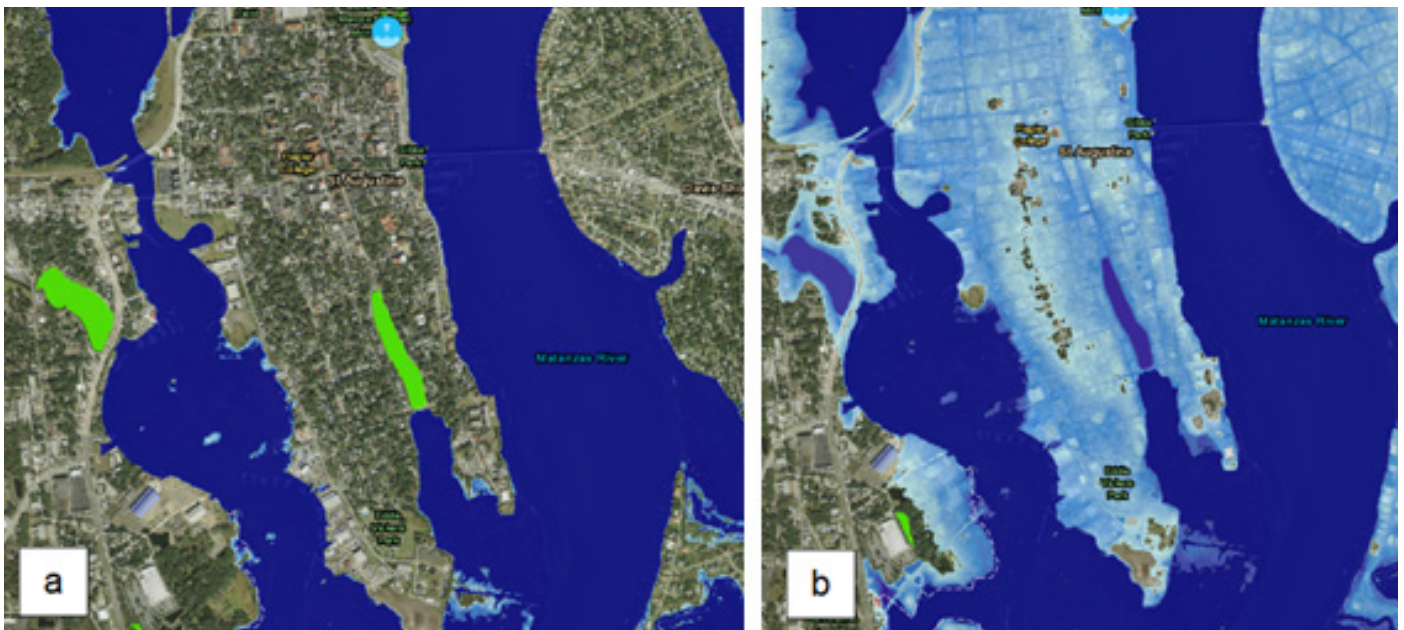
## CHALLENGES & CONCERNS

### Challenges + Concerns

- Addressing nuisance flooding, overflow from LMS, and SLR
- Adaptations must consider LMS Flood Mitigation Project
- Compatibility w/ historic preservation guidelines + citywide efforts
- Funding + economic viability

The City of St. Augustine is vulnerable to three types of coastal flooding: Mean Higher High Water (MHHW), nuisance flooding and the 100-year recurrence interval flood. The vulnerability increases with sea level rise that is projected to increase from 0.4 to 5 feet by 2085. Potential flooding is projected by adding future sea level rise to the current MHHW values (Figure 4). This projection is like a “bathtub model” where the terrain elevation is compared to future water heights. For an increase in 1 ft of sea level rise, few areas within St. Augustine will be flooded but for a 5-ft sea level rise the complete city will be underwater.

**Shaded area indicating flooding, a) 1-ft sea level rise and b) 5-ft sea level rise. Source: NOAA Sea Level Rise Viewer (<https://coast.noaa.gov/slr/>).**



From the three types of coastal flooding that affect the city of St. Augustine, the 100-year recurrence interval flood had always started with a high negative impact for all sea level rise scenarios. Impacts are based on number of days of flooded road networks, passable bridges, flooding of historic and buildings in general. A sea level rise scenario of 1-ft will affect 18% of the road network due to nuisance flooding while 70% due to the 100-yr storm event. For a sea level rise of 5-ft the road network will be affected for 60-90% for the three types of flooding. Bridges vulnerability considered in total nine bridges, where 7 bridges will be impassable due to the 100-yr storm event and 1-ft of sea level rise while only 2 bridges due to nuisance flooding and 1-ft of sea level rise. For a 5-ft sea level rise, the impassable bridges will be 6-9 for MHHW, nuisance flooding and 100-yr storm event. Residential and commercial buildings will be largely affected by the 100-yr storm event for 1-ft and 5-ft of sea level rise, more than 4000 buildings for the 1-ft SLR and more than 6000 buildings for the 5-ft SLR. Nuisance and MHHW flooding represent a minor treat for a 1-ft SLR affecting less than 1000 buildings, but for a 5-ft SLR the threat increases up to 4000 affected buildings. Historic buildings are vulnerable to flooding, for a sea level rise of 1ft the nuisance and MHHW flooding represent less than 10% of increase in vulnerability, while for the 100-yr storm the vulnerability for the same sea level rise is 95%. If the sea level increases by 5ft then 100% of historic buildings are vulnerable for the 100-yr storm event and due to nuisance flooding, and for the same sea level rise combined with MHHW the historic buildings are 80% vulnerable.

## Site-level Vulnerability

After thoroughly surveying the Lake Maria Sanchez study area, there were a few areas that were identified as at-risk areas for flooding and future sea level rise projections. The study area is low-elevation, around 3-ft above sea level based on a 2008 LiDAR scanning. Rainfall, King Tides, and severe weather can cause the water from Lake Maria Sanchez to rise and flow onto Cordova Street. Similarly, since Cordova Street is sloped southward, rainwater runoff from downtown flows south towards the lake, creating more water pooling.

Our team recognized the intersection of St. Francis Street and Cordova Street as highly vulnerable, due to the pooling of water that occurs from lake overflow, downtown runoff, and downward-sloped roads. This intersection contains a one-way road on St. Francis Street moving westbound, and three two-way streets on the remaining roads. This intersection flooded 48 inches during Hurricane Irma, which is highlighted today with a line on a residential floodwall denoting the relative flood level.

To further assess vulnerability in the area, our team assessed demographic information and median household income to determine whether the flooding and future sea level rise would disproportionately affect minorities or low-income populations. Shown below is the NEPAAssist tool, provided by the National Environmental Policy Act and the Environmental Protection Agency, which facilitates the environmental review process and project planning. Within our study area, minority populations are within the lowest block group, from 0-103 based on information from the 2010 Census. Median household income is within the highest block group, 80673-250001, based on data from the American Community Survey (ACS). The Lake Maria Sanchez Flood Mitigation Project also determined that vulnerable populations located west of Lake Maria Sanchez will benefit from the added protection provided by the project, and none will be displaced by the implementation and installation of the project.

## Existing Historic Preservation Guidelines

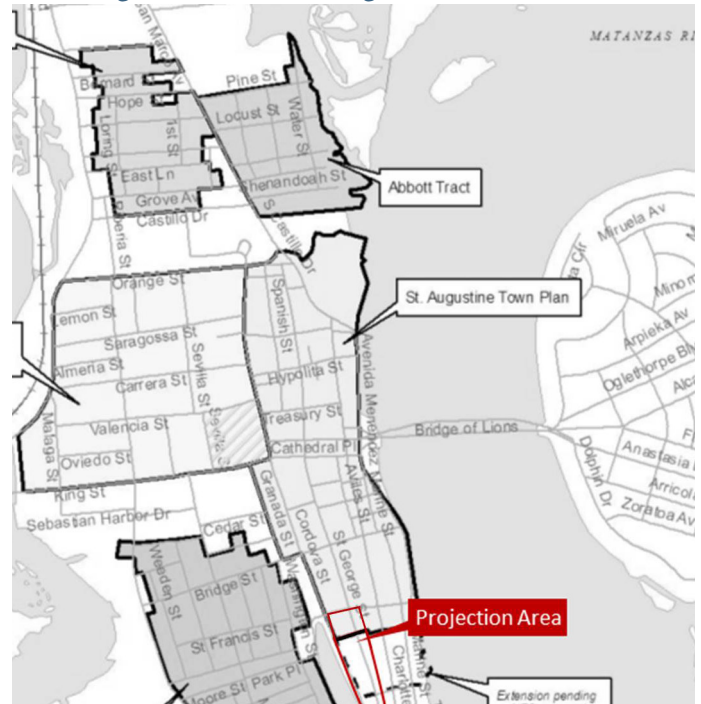
The St. Augustine Architectural Guidelines for Historic Preservation were originally adopted by the City Commission in 1984, were revised in 1989 and again in 1997. These guidelines are intended to assist property owners, developers and the Historic Architectural Review Board (HARB) by identifying historically appropriate options for rehabilitations, new construction and demolitions that will protect and enhance the historic resources in St. Augustine.<sup>31</sup>

The City of St. Augustine has created Historic Preservation (HP) zoning districts to enhance and preserve significant historic buildings, objects, sites and structures, as well as important cultural resources. Most of the projection area is zoned HP-1 (Figure 5). The north area is an integrated part of St. Augustine Town Plan which is one of the National Register Historic Districts while the left area are waiting for NPS approval (Figure 6).

**Figure 5. Historic Preservation Zones**



**Figure 6. National Register Historic Districts**





Buildings are products of environment and climate, cultural and social values, technology and available building materials. Each building in this projection area reflects the culture, economy and technology of its own time. It also witnesses and documents the development and transition of the era. The major architectural styles found in the projection area are Frame Vernacular (Figure 7a), Bungalow (Figure 7b) and Italian Renaissance Revival (Figure 7c).

**Figure 7. Architectural styles found at Lake Maria Sanchez study site.**



Rehabilitation is the main approach to maintain the buildings according to the historic value. These guidelines provide standards for the rehabilitation work after combining the Secretary of the Interior's Standards and Local Standards for Rehabilitation.

#### *New Construction*

- The height, width and massing of buildings should be compatible and similar with each other;
- Horizontal Rhythms should be kept. Strong shared streetscape elements such as divisions between upper and lower floors, uniform porch heights, and alignment of windows are required to be maintained;
- Roof form cannot be changed and should be extended. (Nearly all residential buildings have pitched roofs, with gable or hip the predominant type. Gambrel, pyramidal and flat roofs are also found in this area);
- Proportion of Openings should maintained and keep unchanged;
- Materials that are compatible in quality, color, texture, finish and dimension to those common to the district should be used;
- Buildings may not use distinctive design elements and features from a period different from the one being reproduced.

#### *Accessibility*

- Do property assessment (historical significance, character-defining features, existing and required level of accessibility);
- Preservation and alternative minimum should always be kept in mind;
- Cooperation with different groups to determine the most appropriate solution;

#### *Demolition and Relocation*

- Distinguishing Architectural Characteristics must be retained (Demolish and Relocation)
- Significant Later Additions and Alterations should be maintained (Demolish)

#### *Sign*

- It is most appropriate to locate new signs on the flat, unadorned parts of a facade
- Use simple design and lettering styles are prior
- Sign panels should be square or rectangular and flush mounted.
- Signs should not obscure architectural details or interfere with the sight lines of adjoining buildings

## *Architectural Features*

Retention of distinguishing architectural character and compatible contemporary design for new alterations and additions accessory are two standards that should be applied to all the architectural features. Other standards that should be followed when treat some specific features are listed:

- Recognition of Historic Period (additions, doors and entrances; exterior finishes; fences; walls and gates; storefronts; windows and window treatments)
- Retention of Significant Later Alterations and Additions (accessory buildings including porch; doors and entrances; roofs and roofing; storefronts)
- Sensitive Treatment of Distinctive Features and Craftsmanship (accessory buildings including porch, electrical and mechanical equipment, paint colors and placement, roofs and roofing)
- Repair or Replacement of Deteriorated or Missing Architectural Features Based on Historic Evidence (accessory buildings including porch; doors and entrances; roofs and roofing; storefronts; windows and window treatments)
- Cleaning with Gentlest Possible Method (exterior finishes)
- Sensitive Treatment of Distinctive Features and Craftsmanship (electrical and mechanical equipment; parking, landscaping and site features)
- Reversibility of New Alterations and Additions (accessory buildings including porch, additions).

# COMMUNICATION PLAN

When implementing a plan to communicate sea-level rise to the people of historic coastal communities like St. Augustine, there are three areas to focus on according to the United Nations and Economic Commission for Europe (UN/ECE) Guidelines on sustainable flood prevention (Best Practices on Flood Prevention, 2004): Awareness, Preparedness and Participation.

- Awareness

It is essential that residents in coastal communities recognize that flooding is a general part of their surrounding environment. From a city standpoint, providing knowledge and information on the risk can help prevent unnecessary repercussions from members of the community. With no hazard awareness, it is rare that incentives will be of any help as members would have already suffered from the emotional, mental and physical toll that flood remediation can cause (Best Practices on Flood Prevention, 2004).

- Preparedness

Preparedness is ultimately the result of awareness. From a community perspective, it is based on the necessary information being provided so that individuals can identify ways to mitigate the potential damages. From a city perspective, it is making sure that the city has a plan of action for flood mitigation as well as proper lead time to address flooding and its acting forces in communities (Best Practices on Flood Prevention, 2004).

- Participation

Public participation in the city's decision-making process to mitigate the effects of flooding, improves the quality and the implementation of those decisions. It provides the public the opportunity to express their concerns and enables city authorities to take account of their concerns when implementing plans of action to mitigate the effects of sea-level rise (Best Practices on Flood Prevention, 2004).

There are other residential areas throughout the city as well as private businesses experiencing the effects of sea-level rise. Instead of creating a communication plan to address the specific problems to each individual area, creating a grassroots campaign that is centered on awareness, and preparedness, while encouraging participation not only from residents but business owners as well could be the answer to communicating sea-level rise. Campaigns like "Weather It Together" in Annapolis show how important it is to get community involvement when facing sea-level rise. Thus "¡Viva St. Augustine!" a grassroots campaign was proposed for the City of St. Augustine.

## *Plans for Lake Maria Sanchez*

The LMS project team is confident that small-group meetings combined with resident workshops will communicate the design of the new Flood Mitigation Project effectively. City engineer, Jessica Beach, can lead train-the-trainer workshops so she can ensure residents are getting accurate, in-depth information. The participants of these workshops can then go to other residents, or host workshops of their own. There could be levels of participation to recognize participants who host two or more workshops, reach 30 or more residents, etc.

## *¡Viva St. Augustine!*

When designing any grassroots campaign for flood mitigation and sea-level rise, it is important to keep in mind the goals of the city and the needs of the public. St. Augustine already has a strategic action plan for 2018 which discusses further improvements in the livability, the authenticity and the vitality of the city and its community (2018 Proposed Budget, 2018). Around livability, St. Augustine's goal for 2018 is to use communications and an online presence to promote citizen engagement with a plan centered on customer service. Their mission around authenticity, is centered on reinstating the city government to develop programs that educate residents and visitors. Last is the vitality of the city where city officials hope to develop city values that result in sustainable practices and environmental conservation.

A grassroots campaign in St. Augustine -and any coastal community- must also take into account the needs of the community. According to St. Augustine's 2017 Citizen's Survey, 85% of survey respondents have no intention of leaving in the next five years and even recommend other's move into the city (CityofStAug.com, 2018). Nonetheless, their top priorities and concerns as community members are the natural environment, mobility and education and enrichment (2018 Proposed Budget, 2018). As mentioned before it is important that residents in coastal communities recognize that flooding is a general part of their surrounding environment.

The residents of St. Augustine are aware of their situation as a coastal city and remain eager to participate in the maintenance of their natural environment, their city and their homes  
“¡Viva St. Augustine!” was created with a mobile application as the focal point of the campaign. Over 70% of survey respondents felt that engagement would increase if an app were available, and the city's interest in increasing an online presence alongside the promotion of sustainability resulted in an app-centered campaign (CityofStAug.com, 2018). Instead of printing and disseminating informational publications, providing wide access to the campaign through a simple download allows not only residents to stay up to date on sea-level rise and flood mitigation, but visitors and homeowners as well. The goal of this campaign is to get as many residents -starting with the three site areas- to download the “¡Viva St. Augustine!” app.

The homepage contains a map of the city with colored pins to indicate what areas in the city are currently experiencing flooding. Citizens would be able to use the app to contact city officials about current areas of flooding which allows the city official monitoring the app to drop pins and inform other users of the flooded area.

The bottom dashboard is simple so all age groups can use it with three tabs providing information on awareness, preparedness and participation. The awareness tab allows users to learn about upcoming and in-progress efforts by the city to combat flood issues, provide flood hazard maps, and information on any city posted alerts like a flood watch or warning.

The preparedness tab provides homeowners and business with information self-mitigation tactics from the simple to extreme. It also provides Information on acquiring flood insurance and tips on how to prepare your home or business before the flood. The participation tab informs the public on how they can get involved with the city's efforts whether from a residential standpoint or a business standpoint. Promotional items like decals and bumper stickers to incentivize participation and help get the word out could also be found on this tab.

This plan was developed to be expanded as a model to other cities. It was localized to St. Augustine by assessing three struggling areas and adapting to them as a guideline, but it remains expandable and customizable if taken to another city and applied there with site research as well.

# ADAPTATION OBJECTIVES

To alleviate the nuisance flooding that occurs in the LMS project area, and to better prepare the neighborhood for sea level rise and heavy rain events, we are proposing a set of adaptation strategies focused around flood mitigation. The design solutions build upon an existing framework of road infrastructure updates, flood mitigation strategies in the LMS Flood Mitigation Project, and historic preservation guidelines with respect to flood mitigation. The four proposed adaptation strategies include a “road diet” lane reduction, extension of the stormwater pipes further down Cordova Street, the introduction of living shorelines near the bulkhead, and site-level structural adaptations to houses in the area.

These recommendations aim to improve the quality of life for the residents in the Lake Maria Sanchez project area, but also add to the greater improvement of the City of St. Augustine. Updated stormwater infrastructure and road adaptations have multiple benefits to the community, including the reduction of nuisance flooding during a rain event, improved aesthetics and walkability, traffic alleviation, bicycle and pedestrian inclusivity, and environmental and ecological benefits. Viability of these adaptation strategies will be assessed through these guiding principles and improvements to the community, in addition to their relation to broader city interests and objectives from the Comprehensive Plan, Transportation Master Plan, and the lake Maria Sanchez Flood Mitigation Project.

## ADAPTATION OPPORTUNITIES

### **St. Francis Street Road Diet + Lane Elimination**

#### *General Information*

- Project Objectives + Proposal Specifics
- Florida Department of Transportation (FDOT) Guidelines/Standards

#### *Benefits*

- Walkability + ADA Compliance w/ sidewalks
- Bicycle/Pedestrian Safety
- Aesthetics (local shrubs + plants, water retention, etc)
- Ecological/environmental benefits (water retention and infiltration)

#### *Impacts/Issues*

- ADT Analysis
- Traffic Congestion + Constraints
- No exceptions or variances needed (usually)

#### *Costs, Funding, Economic Viability*

Capital Improvements, Capital Improvements Plan

- Road Infrastructure Update

#### *Design Opportunities + Green Infrastructure*

- Sidewalk design (more natural infiltration?) Bioswales
- Use of coquina? Too porous? Coquina-trim or detailing?

#### *Applicability to greater interests*

(transportation master plan, comprehensive plan)

City-scale planning, relation to LMS Flood Mitigation Project add-on

## Lane Elimination Objectives + Project Details

As defined by the Florida Department of Transportation (FDOT), a lane elimination, also called a road diet, is the

“elimination of through lanes on a road, so that the recovered right-of-way can be converted to bicycle lanes, wider sidewalks, landscaping, on-street parking, or other purposes in order to promote use of non- automobile modes, contribute to more livable environments (e.g., by reducing pedestrian crossing distances and traffic speeds), and/or contribute to economic development and vitality.”<sup>31</sup>

Our group is proposing a lane elimination from two-lanes to one lane on the west side of the intersection on St. Francis Street and Cordova Street. This intersection was deemed highly vulnerable due to the runoff from downtown, overflow flooding from Lake Maria Sanchez, and the downward-sloped roads which creates a pool of water in the intersection during rain events. Typically, lane elimination projects transform a four-lane roadway to a three-lane roadway, however, we are proposing a lane elimination for a two-lane to a one-way street. With the lane elimination, the extra space would allow for design solutions to benefit the intersection and overall surrounding neighborhood, including aesthetic benefits, walkability, flood mitigation, and increased bicycle and pedestrian safety.<sup>32</sup>

### Lane Elimination Process

FDOT has specific guidelines on the construction of lane elimination projects. First, the applicant must provide preliminary project information. Next, there is a series of review processes conducted by the District to determine errors or issues with the project proposal. After review and revision, the applicant then provides a concept report and evaluation focusing on traffic analyses and long-term project needs and goals. There are multiple FDOT offices involved in this step, and the District provides formal comments and the FDOT Central Office is notified. Applicant then provides a Lane Reduction Request form, or a document stating the intent of the lane reduction with prior determined information attached. The final review process includes the applicant discussing public involvement activities and final design, implementation, and funding analyses as applicable. Lastly, the applicant submits the formal application for a lane elimination, and the District conducts a multi-disciplinary review of the formal application and makes a recommendation for approval or denial of the application to the Central Office.<sup>33</sup>



Figure 8. Lane Elimination Process

### Lane Elimination Benefits

Lane eliminations can have many benefits depending on the design solutions that are used in the project. Sidewalks can create walkways for pedestrians to safely use the road, and can help bolster the road's compliance to the Americans with Disabilities Act (ADA). Sidewalks will also promote walkability of the area and add an element of walkable transportation for pedestrians. Similarly, bike lanes create a space for bicyclists to safely use the road. For these road users, lane eliminations can also reduce the amount of traffic incidents by

31 Florida Department of Transportation, Statewide Lane Elimination Guidance Part 2 (December 2014). <http://www.fdot.gov/roadway/csi/Files/Lane-Elimination-Guide-Part2.pdf>

32 Federal Highway Administration, Road Diet FAQ. [https://safety.fhwa.dot.gov/road\\_diets/resources/pdf/fhwasal7021.pdf](https://safety.fhwa.dot.gov/road_diets/resources/pdf/fhwasal7021.pdf)

33 Florida Department of Transportation, Statewide Lane Elimination Guidance (2014). <http://www.fdot.gov/roadway/csi/Files/Lane-Elimination-Guide-Part1.pdf>

reducing the road width and crossing the street.<sup>34</sup> Lane eliminations may also improve the aesthetics of the street by reducing the road width and crossing the street. Lane eliminations may also improve the aesthetics of the street by planting native species or the addition of other aesthetic elements.

### *Lane Elimination Impacts*

FDOT outlines the impacts of an implementation of a lane elimination. One of the most impactful considerations in a lane elimination is an ADT analysis, which is the average daily traffic that occurs on the street. ADT analysis is essential in determining that the lane elimination will not impact congestion negatively, and that the lane elimination proposal is concurrent with current congestion patterns and the Transportation Master Plan. Lane elimination projects are reported to work best when ADT is less than 20,000 on a four-lane roadway.<sup>35</sup> Other impacts include impacts to safety, the environment, parking, property value, transit, pedestrian and bicyclist activity, community support, access, emergency evacuations, etc.

Within our study area, the lane elimination of St. Francis Street will only consider a few impacts due to its location and estimated ADT. As a two-way street in a residential area, the ADT will be significantly lower than an ADT of a four-lane road in a commercial area. A proper ADT analysis must be conducted in order to fully analyze St. Francis Street. Our groups adaptation guidelines and mitigation strategies should positively impact the environment, safety, and pedestrian activity in the area due to the addition of sidewalks, native species, and a bioswale for increased retention to prevent flooding. Since this road is public property, there are no variances or special exceptions needed in the requisition of property.

### *Living Shorelines*

In order to sustain a longer time span of the bulkhead, we are proposing the use of living shorelines as a first protection line. Living shorelines can provide valuable ecosystem services, sediment movement and reduce erosion. Specifically, we are proposing adding artificial oyster reefs (Figure 9) adjacent to the bulkhead by South Street, surrounding the salt marsh. Oyster reefs can provide a coastal defense through wave attenuation, sediment capture and soil build up.

Artificial oyster reefs can be deployed with different techniques, like oyster shell bags, Reefballs<sup>®</sup>, with or without spat, loose oyster shells, and cages with oyster shells. Figure 10 shows two types of artificial oyster reefs. Both techniques will suffice the purpose of reducing wave attenuation, reducing erosion at the base of the bulkhead and promote soil build up. The chosen option will be under discretion of the City of St. Augustine or volunteer organizations that can sponsor the living shoreline.

**Figure 9. Location of bulkhead and the proposed location of artificial oyster reefs, at a regional scale.**



34 Florida Department of Transportation, Statewide Lane Elimination Guidance (2014). <http://www.fdot.gov/roadway/csi/Files/Lane-Elimination-Guide-Part1.pdf>

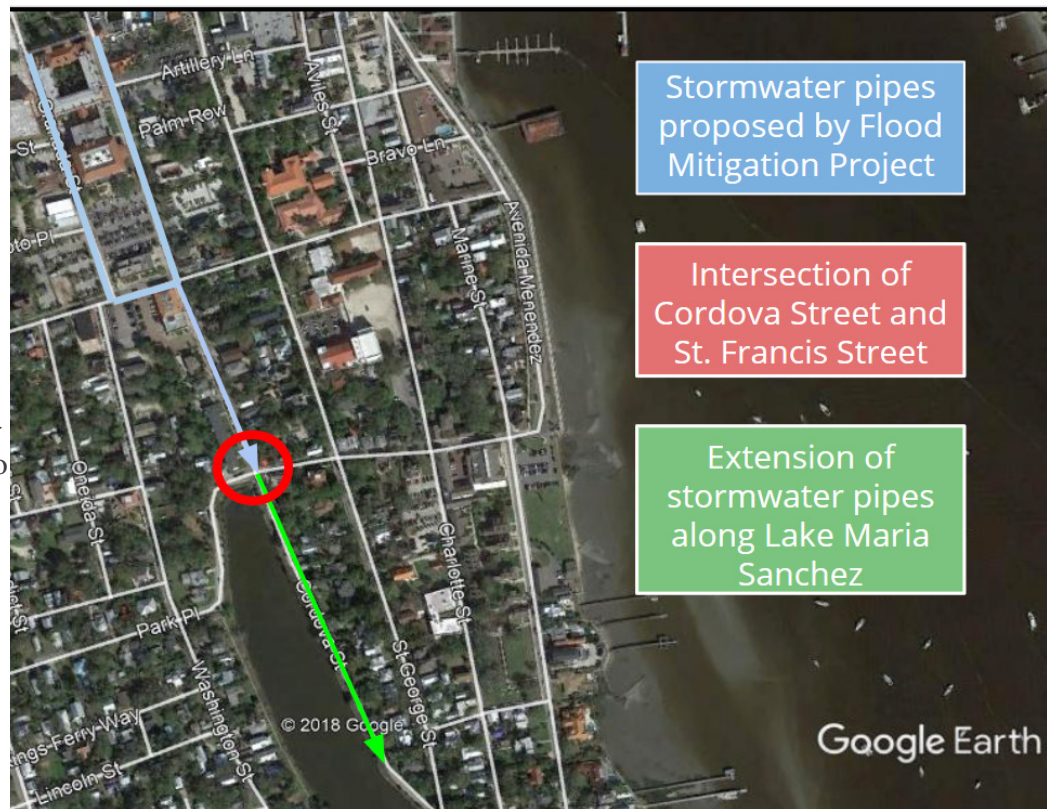
35 Florida Department of Transportation, Statewide Lane Elimination Guidance (2014). <http://www.fdot.gov/roadway/csi/Files/Lane-Elimination-Guide-Part1.pdf> <sup>14</sup>



Figure 10 . Types of building materials for artificial oyster reefs, a) loose oyster shell in bags and b) Reefballs<sup>®</sup>.

### *Extension of Stormwater pipes along Cordova Street*

The Lake Maria Sanchez Flood Mitigation Project outlines an update to the stormwater pipes further south along Granada Street and Cordova Street. However, this stormwater infrastructure stops at the highly vulnerable intersection of Cordova Street and St. Francis Street, where water collects and pools due to runoff from the downtown and overflow from Lake Maria Sanchez. Our group is proposing an extension of these stormwater pipes further down Cordova Street along Lake Maria Sanchez, to allow for more outflows into the lake and further travel of the water down the street. This would alleviate the issue of water collection in the vulnerable intersection, while further improving stormwater infrastructure in the neighborhood.

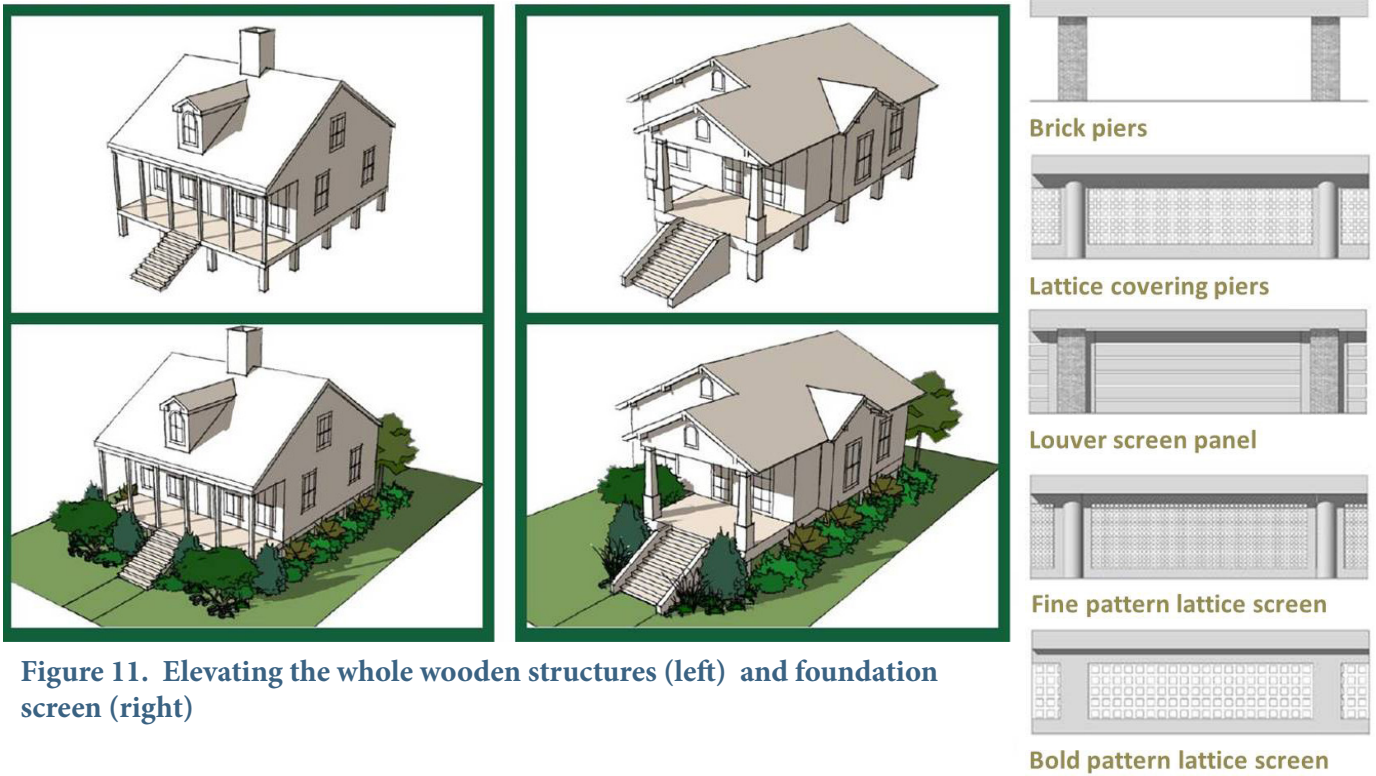


### *Structure-level elevation of Historic Residences*

Historic residences at the LMS project area will also need to be elevated as a precautionary measure from flooding. Before changing the structure's height, it is required to document historic resources with surveys, terrestrial laser scanning and close-range photogrammetry.

The major architectural styles found in the projection area are Frame Vernacular, Bungalow and Italian Renaissance Revival and they are built with either wood or masonry. Two options are presented for the historic residences. One is for wooden structures and the other one is for those structures that cannot be elevated.





**Figure 11. Elevating the whole wooden structures (left) and foundation screen (right)**

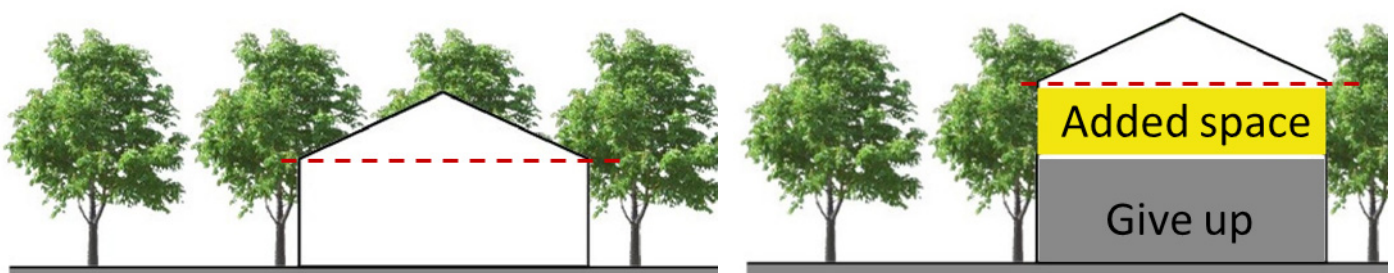
*Elevating the Entire Structure*

This solution can be applied to the wooden structures (Figure 11). Because of the elasticity, portability and of wooden structures, it is relatively cost-effective and operable to conduct the elevation work without causing irreversible damage. What's more, original architectural featured foundation screening such as the piers and lattice screens can be combined with plantings, and fences can be designed in coordination with them. Thus the effect of a medium or high elevation can be softened dramatically.

*Switching Spaces*

The essence of this solution is rising the roof and adding an additional floor under it to switch the space of the first floor thus the property owner's usage demand can be met (Figure 12). The main characters of the first floor can be embraced with waterproof components and allow the flood water to enter. In fact, it is evolved from the combination of dry-flood proofing and wet-flood proofing methods. This solution is designed for the masonry resident buildings, because unlike the wooden structures, the masonry structures are heavy and the components are rigidly connected which lead to the difficulties of lifting the whole building without bringing any damage.

**Figure 12. Switching space**



Working within the context of the LMS Project Area — a historic and residential section of the city — provided a unique opportunity to consider on a small-scale how current city policies and infrastructure are responding to community needs in the face of a changing climate.

Our proposals and legal analysis are designed to build upon the strong foundation the city already has in place. This includes the Lake Maria Sanchez Flood Mitigation Project discussed above.

To build on this foundation, we looked into additional opportunities for St. Augustine to continue to incorporate sea-level rise adaptation planning into traditional decision-making and preservation frameworks.

We specifically looked at the Historic Preservation Guidelines, the Comprehensive Plan, the Historic Preservation Master Plan, and the city codes.

In the legal analysis section we also responded to a specific issue raised by the city concerning potential placement of the Mitigation Project bulkhead on private property.

### *Historic Preservation Guidelines*

*The Secretary of The Interior's Standards for The Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstruction Historic Buildings* states: "Resilience to natural hazards should be addressed as part of a Preservation project. A historic building may have existing characteristics or features that help to address or minimize the impacts of natural hazards. These should always be used to best advantage when considering new adaptive treatments so as to have the least impact on the historic character of the building, its site, and setting." the core idea of this statement is minimizing alterations. This proposed possible changes to the current Historic Preservation Guidelines are revolving around this gist.

An organized and consistent practice process will ensure that the architectural historic buildings can be maintained well toward rehabilitation. The first option available to St. Augustine to incorporate into the current guidelines is the process of flood resiliency for historic structures: 1) priority-setting; 2) documentation; 3) monitoring and maintaining; 4) flood-protection.

- Priority-setting

Current guidelines have already did a survey about the architectural styles and built year. Priority-setting of the residence based on the significance and vulnerabilities assessment can help maximize adaptation-related benefits without committing irreversibly to incurring large costs.<sup>31</sup> From the city level, another option that can be incorporated into the guideline is the priority-setting criterions and assortments of the historic properties. In addition, a flood-protection survey, incorporating a flood risk assessment to identify the risks, the most sensitive and vulnerable areas is worth considering.

- Documenting

Documentation serves as a baseline for the whole rehabilitation work as it provide a record and reference which can help monitor and thus minimize alterations. Besides traditional record techniques, laser scanning, and some other advanced techniques can also be used to generate high quality documentation. Derivatives such as edition, media program, education manual, archive are the main tool of public education, which can promote public engagement. As it is widely believed that widening of the circle of stakeholders involved in a project improves both the process and the outcome, constituency analysis and identification of stakeholders is an extremely important task.<sup>32</sup> It can help opened new doors and avoid adverse impacts and achieve more productive results. The whole city is facing sea level rise, the survey and documenting admit of not dely. Cross-using these techniques is a cost-effective and efficiency way. Thus, it could be a good option to add standards of picking record techniques and requirements of documentation qualities to the existing guidelines.

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31 Florida Department of Economic Opportunity, *Adaptation Plan for St. Augustine, Florida*, p18

32 Randall Mason. "Assessing Values in Conservation Planning: Methodological Issues and Choices." *Assessing the Values of Cultural Heritage*, 2002,17.

A monitoring program should be established during the consultation and documentation phases and continued through the whole life cycle of the historic structures. Especially when the historic structures are facing flooding. Monitoring can help detect, gauge, record and interpret damage, alternation, elevation and other changes to the historic buildings that result from natural or man-made effect.

Good effective maintenance is a key part of flood resistance in historic properties. Basic maintenance such as keeping masonry pointing in good order and sealing gaps around pipes that penetrate the external wall will all help. Check that drains are undamaged and working effectively..... Such suggestions are worth considering and incorporating into the existing guidelines.

- Flood-protection

There are two forms of flood-protection works: flood-resistance or proofing works which attempts to reduce the amount of water actually entering a property and flood-resilient works which reduce the amount of damage caused when water enters the property. The flood-protection work should be applied with sensitivity to historic structures thus they do not damage the special interest or integrity of the building. In particular, the aim must be to retain and respect the existing structure and materials. Appropriate flooding-adaptation measures, particularly for resistance, must be tailored to specific properties – no one size fits all.<sup>33</sup>

- Temporary Flood Barriers

For mild flooding, temporary barriers can be installed either round the building or fitted to the building itself. Interlocking barriers can prevent water reaching the building, using the weight of the floodwater to anchor the barrier. They are used only during a flood to raise the threshold of the historic building to against the rising water. They can be moved once the risk of flooding has been passed. These features are less intrusive than permanent flood barriers, but in order to keep their architectural impact to a minimum, any fixings must be discreet and compatible with an older property.

- Structure Elevation

Elevating the whole structures and Switching space are two solutions that designed based on the condition and characters of the historic structures in St. Augustine. Some basic principles are considered for maintaining the integrity of the district:

Site Design: 1) Retain significant landscape features and relationship between buildings; 2)Protect significant vistas and large and landscapes.

Architectural Design: 1) Identify and integrate neighborhood or original architectural character elements; 2) Minimize elevation change; 3) Use successful elevation example for reference.

Foundation Design: 1) Use existing elements as visual references to be repeated and extended throughout foundation design; 2)Combine the original foundation design(pires, lattes screen) with landscapes and fences.

- Post-flood repair

Once floodwater has entered a building it is almost certain to cause some damage that will require cleaning, drying and repair. However, the extent and degree of damage is dependable. A great deal of damage can be caused by who have little or no experience of working with historic buildings. Main points about dealing with historic structures are worth touching on: 1) carry out a careful assessment of local drainage conditions outside and around the property before deciding to pump water from a basement; 2) carry out post-floor survey; 3) not to attempt to dry old buildings out too quickly by turning the central heating on full blast, as this could cause a great deal of damage.

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33 David Pickles. *Flooding and Historic Buildings*. 2nd ed. Swindon: English Heritage, 2010.

## *Comprehensive Plan - Adaptation Action Area Amendment- Implementation*

Another option available to Saint Augustine is to incorporate adaptation strategies into its traditional decision-making framework by amending the city's Comprehensive Plan Conservation and Coastal Management Element to include Adaptation Action Area (AAA) designations.<sup>34</sup>

The Florida Constitution delegates broad regulatory power to local governments and the Community Planning Act (Chapter 162, Part II, Florida Statutes) guides how local governments may exercise this regulatory power.<sup>35</sup> Pursuant to the Act, local governments are required to adopt comprehensive plans, which are long-range planning tool that guide future development. The Act requires that the plan include certain elements, such as Transportation, Future Land Use, and Infrastructure.<sup>36</sup> Coastal communities like Saint Augustine are also required to incorporate a Coastal Management Element in the Comprehensive Plan.<sup>37</sup> This element addresses development and redevelopment in coastal areas and outlines principles to be used to eliminate inappropriate and unsafe development in those areas.<sup>38</sup> The principles of the overall comprehensive plan are implemented through land development regulations, land development codes, or zoning. All development is required to conform with the principles of the comprehensive plan.<sup>39</sup> Pursuant to Fla. Stat. § 163.3177(6)(g)(10), local governments are permitted but not required to designate AAAs in their comprehensive plans.<sup>40</sup>

The purpose of these flexible AAA designations are to “prioritiz[e] funding for infrastructure needs and adaptation planning” for areas identified by the city as vulnerable to the related impacts of rising sea levels.<sup>41</sup> For more information about AAA designations, we recommend the city consult the Adaptation Action Areas Guidebook: A Planning Guidebook for Florida's Local Government produced by the Georgetown Climate Center.<sup>42</sup>

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34 For a more comprehensive discussion of Adaptation Actions Areas, please see the analysis done by our UF Levin College of Law colleague, Katie Slattery, in the Court Theophelia Project Proposal. This section is intended merely to serve as a broad overview of the authority and potential applicability of Adaptation Action Areas to the city, and not be duplicative of the work Ms. Slattery has already done.

35 Thomas Hawkins, *Land Use Law with a Florida Focus*, p. 75 (Fall 2017)

36 Thomas Hawkins, *Land Use Law with a Florida Focus*, p. 74 (Fall 2017)

37 Adaptation Planning - Planning for Coastal Flooding and Sea Level Rise, Florida Department of Economic Opportunity ([http://www.floridajobs.org/community-planning-and-development/programs/community-planning-](http://www.floridajobs.org/community-planning-and-development/programs/community-planning-table-of-contents/adaptation-planning)

[table-of-contents/adaptation-planning](http://www.floridajobs.org/community-planning-and-development/programs/community-planning-table-of-contents/adaptation-planning))

38 Adaptation Planning - Planning for Coastal Flooding and Sea Level Rise, Florida Department of Economic Opportunity ([http://www.floridajobs.org/community-planning-and-development/programs/community-planning-](http://www.floridajobs.org/community-planning-and-development/programs/community-planning-table-of-contents/adaptation-planning)

[table-of-contents/adaptation-planning](http://www.floridajobs.org/community-planning-and-development/programs/community-planning-table-of-contents/adaptation-planning))

39 Adaptation Action Areas: Policy Options for Adaptive Planning for Rising Sea Levels, p. 6, South Florida Regional Planning Council (2013) ([http://www.floridajobs.org/docs/default-source/2015-community-development/ community-planning/crdp/aaapolicyoptions2013.pdf?sfvrsn=2](http://www.floridajobs.org/docs/default-source/2015-community-development/community-planning/crdp/aaapolicyoptions2013.pdf?sfvrsn=2))

40 Section 163.3177(6)(g)(10), Florida Statutes states:

At the option of the local government, develop an adaptation action area designation for those low-lying coastal zones that are experiencing coastal flooding due to extreme high tides and storm surge and are vulnerable to the impacts of rising sea level. Local governments that adopt an adaptation action area may consider policies within the coastal management element to improve resilience to coastal flooding resulting from high-tide events, storm surge, flash floods, stormwater runoff, and related impacts of sea-level rise. Criteria for the adaptation action area may include, but need not be limited to, areas for which the land elevations are below, at, or near mean higher high water, which have an hydrologic connection to coastal waters, or which are designated as evacuation zones for storm surge.

41 Adaptation Planning - Planning for Coastal Flooding and Sea Level Rise, Florida Department of Economic Opportunity ([http://www.floridajobs.org/community-planning-and-development/programs/community-planning-](http://www.floridajobs.org/community-planning-and-development/programs/community-planning-table-of-contents/adaptation-planning)

[table-of-contents/adaptation-planning](http://www.floridajobs.org/community-planning-and-development/programs/community-planning-table-of-contents/adaptation-planning)).

42 <http://www.adaptationclearinghouse.org/resources/adaptation-action-areas-guidebook-a-planning-guide-19-book>

Local government must have the authority to implement regulations through codes and ordinances, as long as the regulation does not exceed the power delegated to them by state legislatures. Florida is a home rule state, and thus local governments have broad powers to regulate land use to protect the public health, safety, and welfare. Because sea level rise and flooding in the Historic District presents clear public threats, the City of St. Augustine is empowered to mitigate potential impacts. However, any new regulation the City seeks to implement must be consistent with its Comprehensive Plan, State Law and Federal Law. Foremost, after the City incorporates its sea level rise strategies into the Comprehensive Plan as described above, the City should use similar language in the “Purpose” element of its Code. The City’s Adaptation Plan offers exemplary amended language to the Historic Preservation Element of the Code by suggesting its objective contain the following: “Continue to identify, preserve and encourage the adaptive reuse of historic structures in all areas of the City, recognizing that preservation must in some cases entail adaptation to changing environmental circumstances.” As the Adaptation Plan suggests, this model language permits reasonable modifications to vulnerable properties but does not compel the board to grant every request.<sup>31</sup>

#### *Historic Architectural Review Board (HARB)*

To effectively facilitate action addressing sea level rise and flooding, it is imperative that the code empowers HARB to include environmental considerations in its decision making. As an abbreviated example of such purpose, the code may be amended to include the Board’s role to “Implement action and decisions that improve resiliency of those historic properties identified as vulnerable to environmental threats and disasters.”

Additionally, membership on the board should be designed to foster educated and multidisciplinary-driven decisions. Requiring at least one board member have additional qualifications in environmental science, sustainability, or a related field is a feasible method to ensure environmental concerns are contemplated in every board decision. This recommendation is supported by the City’s local flood adaptation and mitigation efforts that emphasize how long-term “vitality” is best achieved by intertwining the two disciplines.

The following is the suggested language for the additional qualification requirement, as it would be included in the “Minimum Qualifications Criteria” of the current Code:<sup>32</sup>

As utilized herein the following fields of experience shall have the minimum qualifications set forth...

(6) Mitigation and Environmental Adaptation of Historic Properties: At least one (1) member of the Board possessing the minimum qualifications as set forth in (1) - (5) of this section must also have the the following minimum professional qualifications in Mitigation and Adaptation:

1. An undergraduate or graduate degree in Sustainability, Environmental Science, or a closely related field.
2. Or at least 2 years of professional experience in mitigation and adaptation management of coastal or historic properties

#### **Expanding Adaptation Opportunities to Vulnerable Properties**

This portion of legal policies proposes code amendments that protect properties before damage by sea level rise, flooding or hurricanes occur. Proactively offering aesthetically-sensitive mitigation strategies, increasing public engagement, and discourse between the City and property owners are notions driving the Code amendments in this section. The below recommendations can be implemented such that protective measures may be utilized by property owners with or without oversight by HARB.

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31 Florida Community Resiliency Initiative Pilot Project - Adaptation Plan for the City of St. Augustine, Florida p. 32 (May 2017)

32 City of St. Augustine Code of Ordinances § 28- 81

## Mitigation Guidelines

The City has several opportunities to amend its Code to expand mitigation measures available to property owners. First, HARB can create criteria suitable for flood damage mitigation that does not necessitate HARB review. Guidance, such as “Disaster Mitigation for Historic Structures: Protection Strategies” can be useful for the City to compile a comprehensive list of pre-approved mitigation strategies.<sup>33</sup>

As an additional precaution, this option may require amending the Code to supplement the duties of HARB. Many local governments have adopted language in their code that requires the boards to prepare guidelines addressing the impact of hurricanes and flooding. For example, adding a section requiring “the Board shall provide homeowners with Guidelines for weatherproofing their property” may be appropriate language to ensure the Board provide mitigation options to homeowners and are empowered to do so.<sup>34</sup>

### *Variances for Environmentally Vulnerable Properties*

As a second option, the Board can add a section of the Code that allows a variance for historic structures vulnerable to environmental threats. This procedure would still require HARB discretion and review, but may increase the availability of mitigation options to property owners. The Code currently allows for the issuance of variances for showing “good and sufficient” cause, such as feasibility and economic hardship.<sup>35</sup> Offering variances for weatherproofing would adopt similar language with additional criteria to determine the issuance of variances.

With this amendment, code language must offer a clear description of the actions requiring review, and the standard of review used to reach a decision. As an implication of this amendment, broadening the discretionary power of HARB opens the door for affected property owners to challenge HARB decisions. Fortunately, when decisions are challenged, courts generally practice judicial restraint and deference when reviewing local government decisions.<sup>36</sup> As a safeguard, review boards may utilize their discretion, yet dutifully base its decisions on specific criteria specified in the Code. Therefore, as long as the decision is supported by applying specific facts to HARB criteria, a clear and detailed list of criteria can be adequate to justify a challenged board decision.

One Study provides a comprehensive evaluation of possible adaptations to protect Alexandria’s waterfront property adjacent to the Potomac River.<sup>37</sup> These Criteria, and other materials may help the City guide how to draft criteria for variances due to environmental vulnerabilities. Further, the “Flood Damage Prevention Ordinance - Variance Procedures” offer variances where strict compliance with Architectural Standards is burdensome or unfeasible due to the structure’s vulnerability.<sup>38</sup>

### Code Amendments Affecting Damaged Properties

The City has the opportunity to amend its Code to protect damaged properties by clarifying the right of property owners to take immediate protective action to prevent further damage, and expediting the HARB review process of plans to repair damaged properties.

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33 DISASTER MITIGATION FOR HISTORIC RESOURCES: PROTECTION STRATEGIES, Prepared by 1000 Friends of Florida on behalf of the Florida Department of State, Division of Historical Resources and the Florida Division of Emergency Management (August 2008).

34 See City of Fort Lauderdale Historic Preservation Design Guidelines (May 2012) <http://www.fortlauderdale.gov/home/showdocument?id=3923>

35 City of St. Augustine Code of Ordinances § 8-453

36 *Berman v. Parker*, 348 U.S. 26, 33 (1954).

37 Potomac River Waterfront Flood Mitigation Study - Evaluation and Recommendation of Mitigation Measures. Prepared by URS Coporation (July 2010).

38 West Point, Georgia Code of Ordinances Sec. 9-81. - Variance procedures

## *Expediting Review Process for Repairing Historic Properties*

The City could amend its Code include an expedited review procedure for the approval of disaster recovery work. The ordinance should define what is eligible for expedited review, the conditions that must be met in order to be eligible for an expedited review, and what the result will be if those conditions are met. For example, one condition required to invoke expedited review are times when a Presidential Disaster Declaration and/or the Governor's Declaration of a State of Emergency.<sup>39</sup> The following language is suggested as a model for adopting an expedited review section of the Code:<sup>40</sup>

The goal of these rules is to facilitate and expedite the approval of restoration work proposed for designated properties. The Board will develop a mutually acceptable list of exempt activities that will not require review for effects on cultural resources. Each list of exempt activities will be agreed upon in writing. The Board will complete the list as soon as possible after implementation of these procedures in order to expedite review.

### *Emergency Circumstances*

The City should be cognizant of the potential for the Code's expedite review language to make the City vulnerable to liability. For example, the City of New Orleans makes an exception from the requirement of obtaining a certificate of appropriateness for "temporary construction, reconstruction, demolition or other repairs on a landmark, landmark site, or building in a district pursuant to the order of any governmental agency or court for the purpose of remedying emergency conditions determined to be dangerous to life, health, or property."<sup>41</sup> Therefore the Code should include a process for Emergency Circumstances. The language should not be overly narrow or ambiguous in order to avoid liability. More model language that addresses these concerns are as follows:<sup>42</sup>

For the purpose of remedying emergency conditions determined to be imminently dangerous to life, health or property, nothing contained herein shall prevent the making of any temporary construction, reconstruction, demolition or other repairs to an improvement, landscape feature, or site within a designated historic landmark district pursuant to an order of a government agency or a court of competent jurisdiction, provided that only such work as is reasonably necessary to correct the hazardous condition may be carried out. The owner of an improvement damaged by fire or natural calamity shall be permitted to stabilize the improvement immediately and to rehabilitate it later under the normal review procedures of this Division.

### *Related Sections of the Code to Consider*

The City encourages property owners to improve historic properties in accordance with the Secretary of Interior's Standards by offering an ad valorem tax exemption for the value of the improvements.<sup>43</sup> However, for improvements to protect or stabilize severely deteriorated historic properties, the Code requires applicant property owners to meet additional standards. For example, if protective measures are temporary, the anticipated threats to the property must be analyzed, the plans must safeguard from further deterioration from weather, and improvements may not affect the aesthetic and historical quality of the Property.<sup>44</sup>

As a result, property owners of more severely damaged properties must overcome more significant hurdles

39 City of Annapolis - Weather it Together: Revising Floodplain Regulations for the Increased Protection of Historic Structures from Flooding Jennifer Sparenberg, CFM, Maryland Historical Trust (April 2016)

40 King County Cultural Resource Procedures (October 2012) <https://www.kingcounty.gov/about/policies/aep/landuseaep/lud161aep.aspx>

41 City of Annapolis - Weather is Together (Summarizing City of New Orleans Code of Ordinance, Division 3, Certificates of Appropriateness)

42 Coral Gables Code of Ordinances Section 3-1117. Emergency conditions.

43 City of St. Augustine Code of Ordinances § 2-382

44 City of St. Augustine Code of Ordinances § 2-387

to qualify for a tax exemption. Further, the Code does not account tax exemption eligibility if improvements were initiated as an emergency response to stabilize a property. If the response meets the requirements for improvement eligibility under the exemption, it may be beneficial to thoroughly integrate the tax exemption procedure and repairs made during an emergency response following damage to a property, where allowable.

### *Anticipating Exposure to Civil Liability*

A local government's duty to the public and the principle of sovereign immunity are fundamental to assessing the legal implications of the proposed actions to the City of St. Augustine. Unless a governmental action is required by law or voluntarily assumed by some affirmative action by the city, local governments have limited duties to the public under general tort law.<sup>45</sup> Further, sovereign immunity may shield a local government from liability by protecting exposure to liability for governmental action designated as "quasi-legislative policy-making."<sup>46</sup>

The Florida Supreme Court uses a "discretionary-versus-operational function test" to determine the nature of a local government's challenged action.<sup>47</sup> The decision to construct or take protective action against flooding is a planning, or discretionary, decision, and local governments do not have a duty to take such action.<sup>48</sup> However, where the governmental action actually creates a hazard, the local government may have a duty to prevent injuries from the hazard, and, accordingly, may not be shielded from liability.<sup>49</sup> More importantly, if the City takes any future action to improve the Historic District's vulnerability to sea level rise or flooding, the City assumes the responsibility to maintain these improvements.

Fortunately, governments are protected from liability for its failure to upgrade a normally-operating, yet inadequate, flood prevention system. However, governments have an affirmative duty to maintain the functionality and performance of these systems. A hypothetical of the streets adjacent to Lake Maria Sanchez illustrate this distinction. For example, if heavy flooding causes Cordova Street to become inaccessible from inundation or deterioration of the paved road, the City may have a duty to repair the road as necessary to maintain accessibility.<sup>50</sup> Conversely, the City is not liable for its failure to exhaust additional measures such as elevating the street following deterioration.

### *Opportunities to Amend the Code to Avoid Liability*

Florida Sea Grant offers a model ordinance that may be a solution for the City if the above hypothetical becomes imminent. In summation, the ordinance should acknowledge the increased threat that sea level rise presents to a vulnerable roadway, and weigh the costs of maintenance, community interests, and the extent of environmental threats. Finally, Florida Statutes have sought to limit public funding for infrastructure in areas that are subject to destruction by natural disaster by requiring "local governments to limit public expenditures that subsidize development in coastal high hazard areas."<sup>51</sup> Importantly, the self-justifying preamble to the ordinance states "it is anticipated that the disruptive impacts of sea-level rise on will increase and passage of this Ordinance provides adequate time for owners of potentially at-risk properties to adjust their reasonable investment-backed expectations; and...seeks to place limits on exorbitant maintenance costs for certain road segments or lawsuits that can reasonably be anticipated and avoided."<sup>52</sup>

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45 Ecological Dev., Inc. v. Walton Cnty., 558 So. 2d 1069, 1071 (Fla. 1st DCA 1990)

46 Fla. Stat. § 768.14

47 Wallace v. Dean, 3 So. 3d 1035, 1047 (Fla. 2009) (See also Legal Considerations Surrounding Adaptation To The Threat Of Sea Level Rise" Prepared by the City of Coral Gables (September 28, 2016)

48 Dep't of Transp. v. Konney, 587 So. 2d 1292, 1296 (Fla. 1991)

49 City of St. Petersburg v. Collum, 419 So. 2d 1082, 1085 (Fla. 1982)

50 See Jordan v. St. Johns Cnty., 63 So. 3d 835, 839 (Fla. 5th DCA 2011)

51 Section 163.3178(1), 163.3177(6)(g)

52 FLA. SEA GRANT, ENVIRONMENTALLY COMPROMISED ROAD SEGMENTS – A MODEL ORDINANCE (Oct. 2015)

[https://www.flseagrant.org/wp-content/uploads/Envirtntly\\_Comp\\_Rds-FINAL\\_10.20.15\\_1.pdf](https://www.flseagrant.org/wp-content/uploads/Envirtntly_Comp_Rds-FINAL_10.20.15_1.pdf)



The code amendments proposed in this report, are effective means to address sea level rise and flooding, yet there are certain risk of exposure to civil liability. As the above model ordinance suggests, the method that the code amendments are effectuated and how the language is drafted vital to adopting a valid and defensible Code amendment.

### *Bulkhead Takings Question*

The city raised specific legal questions concerning the flood mitigation project bulkhead and the potential implication of the Fifth Amendment takings clause of the U.S. Constitution, asking:

- What is the public authority to demand or acquire private lands to construct a seawall on private land?
- Are there are precedent-setting cases in this area to provide some guidance to the city?

In analyzing the city's questions, we considered the following factors:

- The current budget for the project is based on construction costs and does not include cost for acquisition or compensation related to easements.
- The city does not have budgeted funds or costs to cover compensation of private land, but instead is relying on the donation of voluntary easements by landowners.
- In addition to a greater public benefit, the bulkhead would also afford protection to the affected private properties.
- The city is under an obligation with FEMA funding to construct the project with the bulkhead.
- The city has considered the alternative of moving forward without the bulkhead and elevating the road - but that consideration is beyond the scope of this paper and will not be addressed here.<sup>53</sup>

### *Legal Analysis*

#### **i. Overview**

The city should continue efforts to secure the voluntary donation of easements by the affected private property owners. If that fails, the city will need to weigh the costs and benefits of exercising its power of eminent domain to secure the land necessary to build the bulkhead without landowner consent or shift gears entirely and focus on road elevation. Key factors will be potential litigation costs, potential takings compensation costs, potential harm to private landowners, and the potential loss of federal funding if the bulkhead construction is not viable.

#### **ii. Best Option: Voluntary Donation of Easements**

Ideally, the city would secure the voluntary donation of easements by the affected private property owners for construction of the bulkhead. Easements are interests in land that do not convey title, but give “to one other than the owner a right to use the land for some specific purpose.”<sup>54</sup> The voluntary donation of easements have the added benefit to the city and landowners of avoiding the risk of takings litigation (discussed below).

Under Florida law, a riparian owner owns up to the line of the ordinary high water mark on navigable waters. The Florida Supreme Court has stated that riparian rights are sufficiently “property” to be subject to the takings clause and consequently cannot be taken without just compensation.<sup>55</sup> Because the properties affected by the Lake Maria Sanchez Project are above the high tide line, the city may procure the right to construct the bulkhead on these properties either through easements or eminent domain proceedings. The city is empowered to do so under Section 3.02 of the Code (See code below).

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53 Although a road elevation strategy would avoid the need to build on private land, the clear downside of such a strategy is that it jeopardizes the federal funding the city has secured. Additionally, the private property owners on the “wrong side” of the road elevation project would be vulnerable to sea-level rise.

54 *American Quick Sign, Inc. v. Reinhardt*, 899 So.2d 461, 464 (Fla. 5th DCA 2005).

55 *Thiesen v. Gulf, F. & A. Ry. Co.*, 78 So. 491, 507 (Fla. 1918).

Acquisition of most — if not all — of the voluntary easements is not an insurmountable goal for the city. The city has indicated that some property owners are willing to voluntarily donate easements for the bulkhead project. Other coastal cities have also seen success in securing voluntary easements for flood mitigation projects. For example, in the wake of Superstorm Sandy, the state of New Jersey obtained that vast majority of some 2,400 necessary easements for shoreline projects through voluntary donation by property owners.<sup>56</sup> The state attributed its success to “concentrated outreach efforts,” including letters and both public and private meetings, that emphasized the projects protective benefits.

City officials have also emphasized public engagement as key to ensuring affected property owners’ voluntary compliance with construction of the bulkhead.<sup>57</sup> Therefore, aside from the legal implications of constructing a bulkhead on private property, transparency and open communication with affected property owners emphasizing the anticipated benefit of the project compared to the impact on individual property rights are of utmost importance moving forward.

### **iii. Alternatives: Eminent Domain**

If the city fails to secure the voluntary donation of all required easements, it may consider exercising its power of eminent domain to acquire the remaining land necessary for construction of the bulkhead.

The benefits of this strategy are that the city could move forward with the bulkhead project without jeopardizing FEMA funding and it is likely that not all of the properties will require eminent domain condemnation proceedings. The downside of this strategy is that takings, including partial takings which the city would like pursue, generally require compensation for which the city has not budgeted and which may result in costly litigation.

Eminent domain is the power to take private property for public use without the consent of the affected private landowner.<sup>58</sup> State law provides that Florida municipalities may exercise the power of eminent domain so long as the “governing body adopts a resolution authorizing the acquisition of a property . . . by eminent domain for any municipal use or purpose designated in such resolution.”<sup>59</sup>

However, enshrined in the United States Constitution and the Florida Constitution are the guarantees that no private property may be taken except for public use and with full compensation paid to the affected owner.<sup>60</sup> The permanent, physical occupation of private land required by the city for the construction of the bulkhead would most certainly constitute a taking requiring full compensation to the affected landowners.<sup>61</sup> The Florida Supreme Court has interpreted “full compensation” as guaranteeing the owner is “made whole so far as possible and practicable.”<sup>62</sup>

The process for determining just how much compensation would be owed to the affected property owners so that they are “made whole,” however, involves wading into a murky section of takings jurisprudence.<sup>63</sup> If the city moved forward with eminent domain proceedings, it would likely pursue a partial taking, perhaps an easement interest, over the portion of the private property where the bulkhead would be constructed. This is important because it goes directly to the question of compensation owed to the affected landowners.

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56 State Obtains Bulk of Easements Needed for Shoreline Projects; Efforts to Acquire Remaining Easements Continuing Oct. 16, 2014, <http://nj.gov/oag/newsreleases14/pr20141016a.html>

57 City Of St. Augustine City Commission Regular Meeting Agenda Monday, February 12, 2018 - 5:00 p.m.

58 Fla. Const. Art. X § 6.

59 Fla. Stat. §166.401(1) & (3).

60 U.S. Const. amend. V; Fla. Const. art. X, § 6(a).

61 *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 426 (1982) (holding that the physical occupation of plaintiff’s rental property by television company’s cables constituted a constitutionally compensable taking).

62 *Dade County v. Brigham*, 47 So.2d 602, 604 (Fla. 1950).

63 See Florida Eminent Domain Practice and Procedure, Chapter 9 (Fla. Bar CLE 10th ed. 2017).

Florida courts measure the amount of compensation owed in a partial taking based on the difference in the market value of the land free of the easement and the market value of the land burdened with the easement.<sup>64</sup>

“Full compensation for taking private property for a public purpose when less than the entire property is taken consists of the value of the property taken and severance damages to the remainder caused by the taking, if any.”<sup>65</sup> Pursuant to Fla. Stat. §73.071(3)(b) “[w]here less than the entire property is sought to be appropriated, any damages to the remainder caused by the taking” must be included in the compensation calculation. The Florida Supreme Court explained the rationale of this provision as putting the affected landowner in financially the same position as if the taking had not occurred.<sup>66</sup>

It will be important for the city in weighing the pros and cons of eminent domain proceedings to consider the possibility that benefits received by the property owner as a result of the project may be used to offset severance damages in a compensation assessment. Should the city progress to eminent domain proceedings, an ideal result would be an outcome similar to that reached by the New Jersey Supreme Court in 2013.

In Borough of Harvey Cedars v. Karan, landowners challenged local government easement condemnations over privately-owned dry-sand beaches as part of storm-mitigation measures in the wake of Hurricane Sandy on just compensation grounds, arguing that the construction of large sand dunes along the shoreline would block views of the ocean.<sup>67</sup> The New Jersey Supreme Court rejected the claims, requiring trial courts and juries to consider, in valuing easements, the benefits provided by the storm-mitigation and damages in that case were limited to \$1.<sup>68</sup>

Unfortunately (or perhaps fortunately) Saint Augustine is not in New Jersey and the issues raised in both cases differ so Borough of Harvey Cedars v. Karan does not offer persuasive legal precedent on which the city may rely. However, the legal argument behind the case is compelling and may provide a roadmap for an affirmative defense to severance damages should the city pursue eminent domain proceedings.

## BUDGET SUMMARY

DESIGN SOLUTIONS	COSTS		Estimated cost (\$)
Living Shorelines - artificial oyster reefs	\$ 361/lf	1700 lin-ft	613700.00
Lane Elimination	\$11.75/sq ft (street, sidewalk, bioswale, and native plants) <sup>58</sup>	\$175 each (trees)	67000.00~

National Stormwater Management Calculator. [http://greenvalues.cnt.org/national/cost\\_detail.php](http://greenvalues.cnt.org/national/cost_detail.php)

\*Due to the variance in prices pending legal decisions, we are not able to offer costs at this time. Further decisions are needed to give figures.

64 Cordones v. Brevard County, 781 So.2d 519, ### (Fla. 5th DCA 2001).

65 Partyka v. Florida Department of Transportation, 606 So. 2d 495, 496 (Fla. 4th DCA 1992).

66 Department of Transportation, Division of Administration v. Jirik, 498 So.2d 1253 (Fla. 1986).

67 70 A.3d 524 (N.J. 2013).

68 Id. at

# STAKEHOLDERS

CITY OF ST. AUGUSTINE, INCLUDING:  
MAYOR AND COMMISSIONERS  
PUBLIC WORKS DEPARTMENT  
ENGINEERING DEPARTMENT  
COMMUNICATION AND OUTREACH DEPARTMENT  
CITY MANAGER AND STAFF

FULL-TIME AND PART-TIME RESIDENTS OF LMS PROJECT AREA  
RESIDENT OWNING PROPERTY NEEDED FOR BULKHEAD IMPLEMENTATION  
ARMY CORPS OF ENGINEERS  
HISTORICAL PRESERVATION REVIEW BOARD (HARB)  
TOURISTS OF ST. AUGUSTINE  
REAL ESTATE AGENTS LISTING HOMES IN THE LMS AREA

# CONCLUSION



This proposal was drafted by team members of Hail Mary Coastal Consulting

Our team has specialties in the areas of:

Historical Preservation

Coastal Engineering

Communications

Urban and Regional Planning and Design

Law

Our team enjoyed this project and the challenges it presented. Thank you for the opportunity.

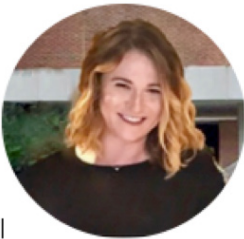
# TEAM QUALIFICATIONS



Nathaniel Chan, College of Design, Construction, and Planning  
Nathaniel is a graduate student in Urban and Regional Planning at the University of Florida. Originally from South Florida, Nathaniel graduated from Florida Atlantic University with a B.A. in Anthropology and a Certificate in Environmental Science. He currently serves as the Social Chair and member of the Executive Board for the Student Planning Association at UF.



Lisha Chen, College of Design, Construction, and Planning  
Lisha is a Ph. D. student in Historic Preservation at the University of Florida with an specialization in 3D laser scanning and close-range photogrammetry. She received a B.A. in Architecture. Lisha currently serves as a research assistant for Envision Heritage focusing on historic structures' documentation.



Lauryn Fabrizio, Levin College of Law  
Lauryn is a third-year law student at the Levin College of Law, and graduated with a B.A. in Anthropology and Criminology/Law from the University of Florida in 2015. She is currently a legal extern at an environmental non-profit organization in Jacksonville. Lauryn intends to practice Environmental, Real Estate or Land use law in Northeast Florida following her graduation in May 2018.



Gisselle E. Guerra Saval, Herbert Wertheim College of Engineering  
Gisselle is a PhD candidate at the Engineering School of Sustainable Infrastructure and Environment with an specialization in Coastal and Oceanographic Engineering. Before pursuing her PhD degree, she was working as a researcher and a part-time faculty at the Universidad Tecnológica de Panamá in Panamá. After completing her degree she will go back to Panamá and try to understand coastal processes in her country.



Kati Lawson, College of Agricultural and Life Sciences  
Kati is a lecturer for the Agricultural Education and Communication department in UF's College of Agricultural and Life Sciences at the Plant City location. Kati is also a first year Ph. D. student studying agricultural communication at the University of Florida. Before becoming a lecturer, she taught public school for seven years in Okeechobee County.



Kaci Poor, Levin College of Law  
Kaci is a second-year student at the Levin College of Law. She serves as a research assistant for the Center for Governmental Responsibility and for the Environmental and Land Use Law Program. Prior to attending law school, Kaci worked as a daily news reporter, as a women's health advocate, and as a public policy fellow in California's Executive Branch. Kaci received her B.A. in Journalism, magna cum laude, from Humboldt State University.

# Nathaniel Chan

1212 SW 5<sup>th</sup> Avenue Apt #2, Gainesville, FL 32601

954.881.8298

[Nchan1@ufl.edu](mailto:Nchan1@ufl.edu)

## Education

### **University of Florida – Gainesville, FL**

- Pursuing a Master's Degree in Urban and Regional Planning, with a specialization in Environmental Planning and Sustainability
- 3.83 GPA

**August 2017 - present**

### **Florida Atlantic University – Boca Raton, FL**

- Bachelor of Arts degree in Anthropology
- Certificate in Environmental Science
- Magna Cum Laude
- 3.861 GPA

**August 2012 – May 2017**

## Experience

### **UF OPS Digital Library Student Assistant – Gainesville, FL**

- Digitized sensitive library material using imaging scanners and Adobe [Photo Shop](#)

**August 2017 - present**

### **Broward County Library Student Page – Coral Springs, FL**

- Assisted with discharging, mending, and shelving library materials at West Regional Library
- Facilitated 3D Printing, music production, and photography at Northwest Regional [Library's Creation Station](#)

**May 2015 – August 2017**

### **Old Navy Sales Associate – Sunrise, FL**

- Cashier responsible for cash register balancing, assisting customers, and prepping merchandise

**June 2015 – February 2016**

### **Harvard Academy Physical Education Instructor Assistant**

- Demonstrate exercise and physical education to students kindergarten through 8th grade
- Prepare activities for classes

**August 2014 – June 2015**

### **Student Orientation Leader at Florida Atlantic University High School**

- Facilitated the guidance of incoming freshman through FAU High School's curriculum

**Summer 2015**

**Volunteer Note-Taker for FAU's Office for Students with Disabilities** August 2013 – May 2014

- Recorded detailed notes for each class for certain courses

**Harvard Academy Volunteer Tutor and Assistant** August 2013 – May 2016

- Assisted teachers with cleaning, tutoring students in math, prepping for school events (graduation ceremony, school performances, first day of school)

### Accolades

**Florida Atlantic University President's Honor List** Fall 2016, Spring 2015

- 4.0 GPA

**Phi Eta Sigma Induction** Spring 2014

- Academic Achievement

**National Honor Society** Spring 2014

- Academic Achievement and educational standing

**FAU College of Arts & Letters Dean's Honor List** Spring 2014

- Ranked in the top 10% of students in the College of Arts and Letters for 4 semesters

### Research

▼ Summer 2014

**FAU: Harbor Branch Oceanographic Institute**

- On-site studies researching Florida's waterways, environment, and ecosystems

### Languages

- English – native language
- Spanish – speak, read, and write with intermediate competence
- Cantonese – comprehend and speak with basic competence

### Professional Organizations

- American Planning Association
  - UF's Student Planning Association
- August 2017-present

### Professional References Available Upon Request

# LISHA CHEN

lishachen@ufl.edu • (352) 870-9205 • 306 Diamond Village • Gainesville, FL

## EDUCATION

<b>University of Florida, Gainesville, FL</b> PhD student in Historic Preservation	<b>2016-Present</b>
<b>University of Nanjing Institute of Technology, Nanjing, Jiangsu, China</b> Bachelor of Architecture	<b>2009-2013</b>

## EXPERIENCE

**Envision Heritage, University of Florida, Gainesville, Florida** **08/2016-present**

Research Assistant

- Documentation of Vizcaya museum stone barge and swimming pool grotto
- Documentation of Georgetown City Hall
- Documentation of houses in Nantucket, etc..

**Shanghai Jianwei Architecture Preservation Eng. Tech. Co. Ltd., Shanghai** **04/2015-06/2016**

Leader, Design Department

- Renovation of the Missionary School in Xueyang County, Hunan
- Investigation on a historic village from Ming and Qing Dynasties, Hunan
- Shanghai General Chamber of Commerce, Shanghai
- Renovation of the Calmette International Hospital, Kunming, Yunnan
- Renovation of the Red Cross Hospital in Lyshun, Dalian, Liaoning, etc..

**Giant Union Design, Shanghai-Designer, Space department** **08/2014-04/2015**

- Urban Concept Design of Kaifeng City, Henan
- Design of the Pingyu County, Zhumadian, Henan
- Planning of Zizhong, Sichuan , etc..

**International Research Center for Heritage Conservation, Shanghai** **12/2012-07/2014**

Deputy Leader, Design Department

- Archaized Design of the Ancestral Hall in Xiangshan County, Ningbo
- Design for China's Imperial Examination Museum & Cultural Facilities
- Architecture Parking of the Xinchang Ancient Town, Shanghai
- Protection Restoration & Realignment Project of Beishi Street , etc..



# LAURYN VIRGINIA FABRIZIO

lfabrizio@ufl.edu • (386) 237-5590 • 2525 SW 2nd Avenue • Gainesville, FL

## **EDUCATION**

**UNIVERSITY OF FLORIDA LEVIN COLLEGE OF LAW**, Gainesville, FL

*Juris Doctor Candidate*, May 2018

**Activities:** The Federalist Society, Executive Director of Membership & Vice President of Special Events; Mental Health Law Association, Secretary; Student Recruitment Team; Student Mentor/Admissions Program; The Restoration of Civil Rights Project; The Ask-A-Lawyer Project

**Coursework:** Agricultural Law (A); Condominium and Community Development; Historic Preservation (A-); Land Use; Real Estate Document Drafting; Real Estate Transactions

**Writing and Research:** Seminar Topic: "Resilience Through Emergency Management a Study of Charleston's past, current and continuing efforts to Preserve its Historic Character"; Seminar Topic: "The Conflict Between the Fair Housing Act and Condominium Association Governance"; Freelance Writer (discussing current topics in employment law, liability insurance, and arbitration law)

**UNIVERSITY OF FLORIDA**, Gainesville, FL

*Bachelor of Arts, Double Major in Criminology/Law and Anthropology*, May 2015

**Honors:** Cum Laude; Recipient of the USTA Serves Scholarship; Recipient of the Carolinas Bennett-Maples Scholarship

## **EXPERIENCE**

**The Public Trust Environmental Legal Institute of Florida**, Jacksonville, FL

*Extern*, January 2018 – Present

- Pursued enforcement of environmental regulations in Northeast FL
- Required a holistic understanding of environmental regulations (including the operation of locations subject to environmental permitting, the technical processes involved, and the environmental and biological implications)

**UF Office of the Vice President and General Counsel**, Gainesville, FL

*Extern*, May - August 2017

- Drafted policy recommendations, and reviewed contracts between the University and third parties
- Identified potential defects in the University's governance

**Disability Rights Florida**, Gainesville, FL

*Intern*, May - December 2016

- Involved in Civil Rights advocacy issues in Florida State and Federal court

# Gisselle Esther Guerra Saval

25 SW 5th Terrace  
Apt 4211  
Gainesville, FL 32601

University of Florida  
365 Weil Hall  
Gainesville, FL, 32611-6580

Email: [gisselle.guerra@ufl.edu](mailto:gisselle.guerra@ufl.edu), [gisselle.guerra@gmail.com](mailto:gisselle.guerra@gmail.com)  
(352)870-6733

<b>Objective</b>	<ul style="list-style-type: none"><li>· Researcher position in an academic unit in Coastal and Oceanographic Engineering.</li></ul>
<b>EDUCATION</b>	
2016 - Present	<b>UNIVERSITY OF FLORIDA. Gainesville, Florida, USA.</b> PhD student in Coastal and Oceanographic Engineering
2010 - 2012	<b>UNIVERSITY OF FLORIDA. Gainesville, Florida, USA.</b> Master of Science with a Major in Coastal and Oceanographic Engineering
2004 – 2009	<b>TECHNOLOGICAL UNIVERSITY OF PANAMA. Panama City, Panama.</b> Bachelor of Science in Environmental Engineering Certificate of Suitability: 2009-120-005.
<b>PROFESSIONAL EXPERIENCE</b>	
March 2009 – December 2015	<b>Centro de Investigaciones Hidráulicas e Hidrotécnicas, Universidad Tecnológica de Panamá - Panamá</b> <ul style="list-style-type: none"><li>· Researcher of water quality and ocean engineering projects.</li><li>· Co-creator of the network: Indicators of Climate Change through marine water quality parameters (REMECA in Spanish).</li><li>· Coordinated the Unit of Teaching and continuing education.</li><li>· Developed and organized courses in environmental topics, oceans and water quality for students and professionals.</li></ul>
March 2013 – December 2015	<b>Part Time Instructor, Faculty of Civil Engineering</b> <b>Undergraduate courses - Panamá</b> Course: Principles of Hydrodynamics (4 credit hours) Course: General Ecology (4 credit hours) <b>Graduate courses</b> Course: Coastal Engineering (3 credit hours)

<b>HONORS AND AWARDS</b>	<ul style="list-style-type: none"><li>· Bob and Phyllis Dean Fellowship in Coastal Engineering 2017-2018</li><li>· Latin American Scholarship – State of Florida, University of Florida 2016-2018</li><li>· Hugh L. Popenoe Mesoamerican Research Endowment – Research travel grant at Panama (Center for Latin American Studies) 2016</li><li>· Fulbright-Laspau Scholarship 2010-2012</li></ul>
<b>ADDITIONAL SKILLS</b>	<ul style="list-style-type: none"><li>· Languages: Advanced English and Spanish (mother tongue)</li><li>· Matlab programming</li><li>· ADCP, CTD &amp; Turbidity programming</li></ul>

## Kati Lawson

Gulf Coast and Research Education Center  
Agricultural Education and Communication Department- University of Florida  
Phone: (813) 757-2284 | kmcwaters@ufl.edu

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### EDUCATION

#### **B.A. in Agricultural Communications with a minor in Leadership, May 2009**

University of Florida, Gainesville, FL

#### **M.Ed. in Education with a specialization in Guidance, May 2015**

Angelo State University, San Angelo, TX

### TEACHING EXPERIENCE

#### **University of Florida**

##### **Plant City, FL July 2016- Present**

Communication and Leadership Development Lecturer for the Agricultural Education and Communication Department

#### **Courses Taught:**

The Communication Process in Agricultural and Life Sciences (AEC4031)  
Instructional and Event Planning in Agricultural & Life Sciences (AEC3209)  
Advanced Agricultural Communication Writing (AEC4035)  
Working with People: Interpersonal Leadership Skills (AEC3413)  
Communication Campaign Strategies in Agricultural and Life Sciences (AEC4052)  
Digital Media Production in Agricultural and Life Sciences (AEC3070)  
Issues in Agricultural and Life Sciences (AEC3065)

#### **Workshops**

Spring 2016- Effective writing in Extension (for UF extension)

#### **Okeechobee High School (Aug. 2013-present)**

##### **Educator/College and Career Counselor**

- *Education Duties:* Taught agricultural communications to 10<sup>th</sup>, 11<sup>th</sup> and 12<sup>th</sup> grade students while also functioning as the college and career counselor during the 2013-2014 school year

#### **Osceola Middle School (Dec. 2010-June 2013)**

##### **Educator**

- Taught math to 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> grade students (1 year)
- Taught 5<sup>th</sup> grade with a specialization in math  
Appointed as 5<sup>th</sup> grade department head for 2012-2013

### PROFESSIONAL ORGANIZATION MEMBERSHIPS

North American Colleges of Teachers of Agriculture (NACTA)

National Young Farmers and Education Association (NYFEA)

### SELECTED CONFERENCE PRESENTATIONS

Lisa K. Lundy, Nicole Stedman, Andrew Thoron, Deb Barry, **Kati Lawson**, and Brian Myers

"Implementing Curriculum and Classes for One Degree with Two Locations and Two Specializations", NACTA 2017.