



# AVENIDA MENENDEZ

ST. AUGUSTINE, FLORIDA



Spring, 2018

SEA LEVEL RISE AND COASTAL CITIES: SCIENCE, POLICY AND PRACTICE

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# AVENIDA MENENDEZ

ST. AUGUSTINE, FLORIDA

## INTRODUCTION AND BACKGROUND

## EXECUTIVE SUMMARY

The analysis, discussion, and recommendations outlined in this proposal are in direct response to a request by the City of St. Augustine. The city would like to use student work as a brainstorming session on the impacts of Sea Level Rise (SLR). Students from the University of Florida were organized into groups around 3 survey sites.

The site team for the Avenida Menendez site consisted of 5 students from the following: College of Law, College of Engineering, College of Journalism, and College of Design, Construction, & Planning. The student team engaged the analysis from multiple angles; from a regulatory perspective, as a small-scale design problem, and from a zoomed-out approach. This student team felt it was important to see their site as one part of a whole urban network. The following student proposal aims to provide information on the following:

- A thorough and clear examination of the vulnerability of the Avenida Menendez site
- Exploration and assessment of existing regulations which are possible to alter or adjust for better implementation of adaptation planning
- Information about administrative tools available to promote adaptation planning for the waterfront site
- Discussion over micro and macro scale relationships which make site adaptation successful
- Suggestions for adaptations options and possible design solutions for adaptation and improvements

The following report will serve as a framework for pursuing adaptive methods for the site known as "Avenida Menendez". It will draw from local and national data and on communication with St. Augustine officials and community members. This report is intended to complement the student group's field work and presentation to the city staff and public. The organization of material was structured around collaboration, sharing of information, and stakeholder engagement.

# INTRODUCTION

Avenida Menendez site varies from the other selected sites in this student study of SLR impacts during spring 2018. This site is water-front on the Matanzas River. It contains constructed hard engineering and a dense built environment. Because of this existing network of elements, and due to high cultural value of the site, the forthcoming analysis calls for a reconsideration of parameters and a reassessment of treatments used in planning and historic preservation application.

The following discussion over vulnerability of the Avenida Menendez site is meant to illuminate possible actions that might be employed by homeowners and by the city of St. Augustine. Explorations of broad context ideas coupled with small-scale place-making have large implications for adaptation planning. This site will serve as an example for other waterfront contexts and may be representative for other coastal cities in general.

The Avenida Menendez waterfront is an artery of the economic heart of St. Augustine and a piece of the larger St. Augustine Town Plan Historic District. This site is forefront in SLR considerations for the city because of its location, its iconic seawall, and its mosaic of architectural styles. The site has benefited from major recent investments, yet there are challenges ahead. The following study of adaptation methods for the Avenida Menendez has illuminated spatial relationships in an unconventional manner. This new perspective raises questions about private-public roles and the treatment of historic properties at risk. In this approach, there are opportunities for creativity and for new ideas. A fresh approach is essential to achieving the goal; to protect the built environment and its residents, who are integral part of the cultural fabric.



## AVENIDA MENENDEZ CONTEXT ANALYSIS

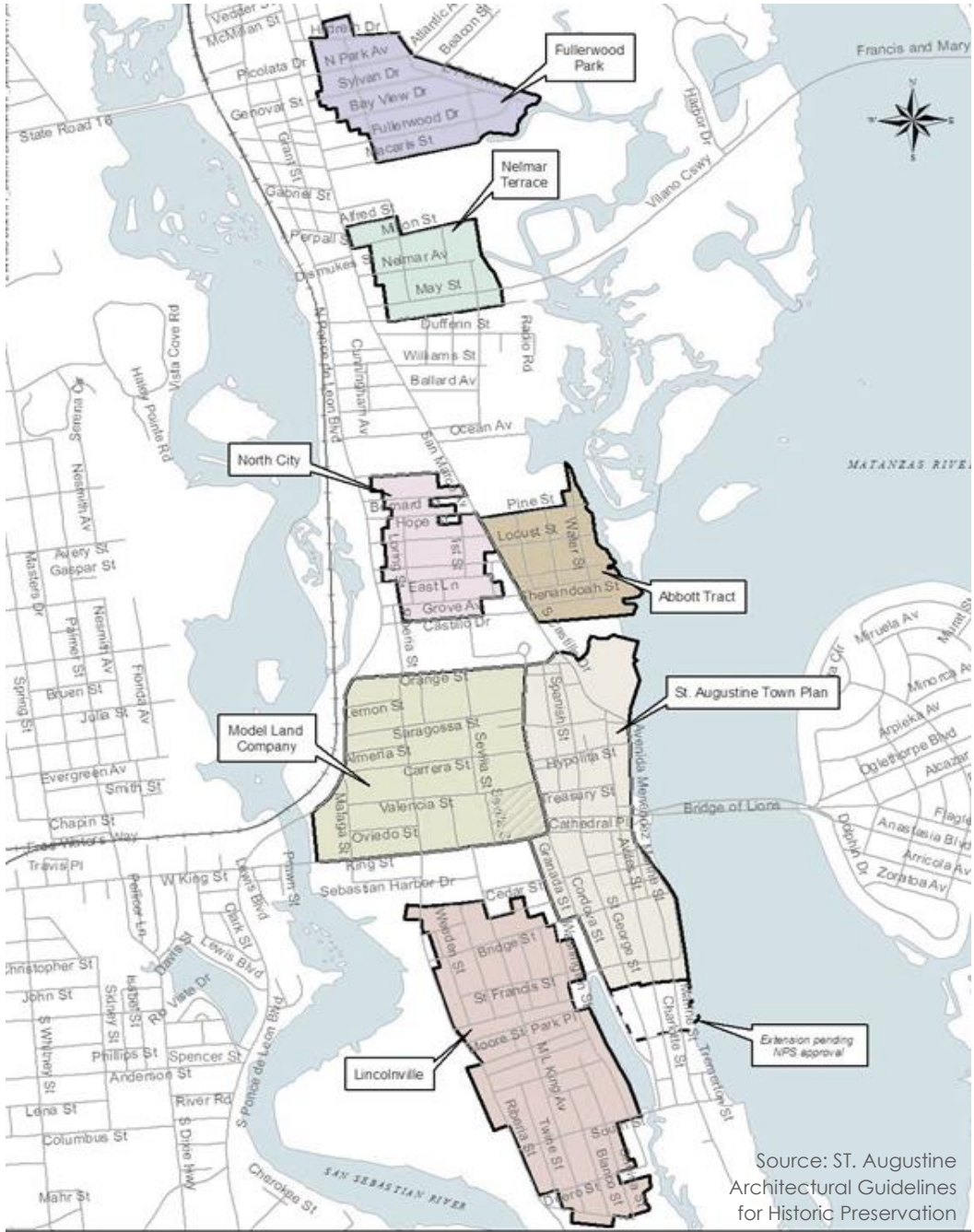
The Avenida Menendez site is located within one of seven historic districts in St. Augustine, which is the St. Augustine Town Plan. This Historic District is considered one of Florida's most architecturally significant areas, containing the greatest concentration of colonial and Flagler Era buildings built between 1672 and 1935. The site is bounded by King Street, Charlotte Street, St. Francis Street and Avenida Menendez itself, which runs along the Matanzas River waterfront and is bounded by the historic seawall built in 1833 and the new seawall built in 2014.




The City of St. Augustine was founded in 1565, and it is considered the site of the oldest continuously occupied European settlement in the United States. The St. Augustine Historic District numbers among Florida's most architecturally significant areas because of the variety of buildings embodying a number of different uses, materials, styles and periods of development, and its association with a number of important architects and builders like Alexander Jackson Davis, James Renwick and Franklin W. Smith.<sup>1</sup> Archaeological excavations, conducted since the 1930s have uncovered sites dating to the sixteenth century within the limits of the St. Augustine Historic District, which have served in the reconstruction of many of these buildings. The main architectural styles found within the district include Spanish Colonial, British Colonial, Queen Anne, Gothic Revival, Colonial Revival, Masonry and Frame Vernacular, St. Augustine Colonial Revival, and Bungalow. The St. Augustine Historic District, or Town Plan, is also significant due to its town planning and settling history, along with its religious and economic significance.



Beginning in 1821, when the United States acquired Florida, new settlers arrived to the city and the construction of railroads helped grow the economy and the population. Henry M. Flagler visited St. Augustine in 1885, and he envisioned the Ancient City becoming the Winter Newport, starting the Flagler Boom Era. This period changed the physical appearance of the city and it helped develop the tourist industry within the State. Much of the infrastructure present within the city was built during the Flagler Era including major streets, sidewalks, utilities, and drainage. Much of it has been updated to current standards, but it is all part of the rich history of the St. Augustine Historic District.

<sup>1</sup> St. Augustine Historic District Nomination



-  Iconic
-  Economic Driver
-  Representative

Source: ST. Augustine Architectural Guidelines for Historic Preservation

## St. Augustine National Register Historic Districts

The Avenida Menendez waterfront is an artery of the economic heart of St. Augustine and a representative of the larger St. Augustine Town Plan due to its location, its iconic seawall, and its mosaic of architectural styles. The waterfront has benefited from major recent investments and we are using it as a model for the rest of the district by revisiting adaptation measures that will take advantage of and enhance the existing infrastructure. Returning to this site for a study in adaptation methods, you are getting to see things in a way that have not previously been seen and there are opportunities for new discoveries and new ideas. By conducting this reexamination, our goal is to protect the built environment and its residents, who are integral part of the cultural fabric.

# BENCHMARK ANALYSIS

## ST. AUGUSTINE: Avenida Menendez Seawall as a Remedy for Historical Flooding Issues and Erosion.

The historic St. Augustine seawall started to be built originally by the Spanish in 1696 south of the Castillo de San Marcos fort. Between 1833 and 1844, another section of the seawall was built by graduates of the United States Military Academy at West Point. Since its construction, the historic seawall has faced erosion and collapse due to hurricanes and regular stormy weather and in 2008, Tropical Storm Fay partially collapsed it. After this event, St. Augustine took on the task of constructing a new seawall that would protect the historic one and the city's historic integrity.

The new Seawall that was constructed 12 feet into the water from the old wall to protect the original historic structure was built to withstand a category 1 tropical storm. It was built with concrete and reinforced steel, and the gap between the two walls was filled in and paved so it could once again serve as a waterfront promenade with a paved walking path, new streetlights and landscaping.

## LOUISIANA: Elevation Design Guidelines for Historic Buildings in the Louisiana GO Zone

The Louisiana Division of Historic Preservation (DHP) prepared the Elevation Design Guidelines with the intent to conserve the historic character of Louisiana's cities, towns, neighborhoods and buildings, where possible, by integrating both traditional and innovative elevation design approaches in a sensitive manner.<sup>2</sup> The document is divided into separate sections where the guidelines aim to facilitate the decision-making process to successfully complete the required historic preservation review, allowing elevation projects to be funded in a manner that achieves both risk reduction and preservation of irreplaceable historic buildings and districts.

Section 1: Introduction

Section 2: Site Design Guidelines: Provides information about the site on which the historic building is located.

Section 3: Architectural Design Guidelines: Discusses considerations regarding neighborhood urban design context, evaluating elevation alternatives, historic building types and architectural features, data needed for designing elevation plans and evaluating their effects on the historic building, and goals for new screening and scale minimization.

Section 4: Foundation Design Guidelines: Identifies engineering factors for designing new foundations for elevated buildings and includes detailed illustrated approaches to foundation screening.

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<sup>2</sup> Louisiana Office of Cultural Development. Elevation Design Guidelines for Historic Buildings in the Louisiana GO Zone.



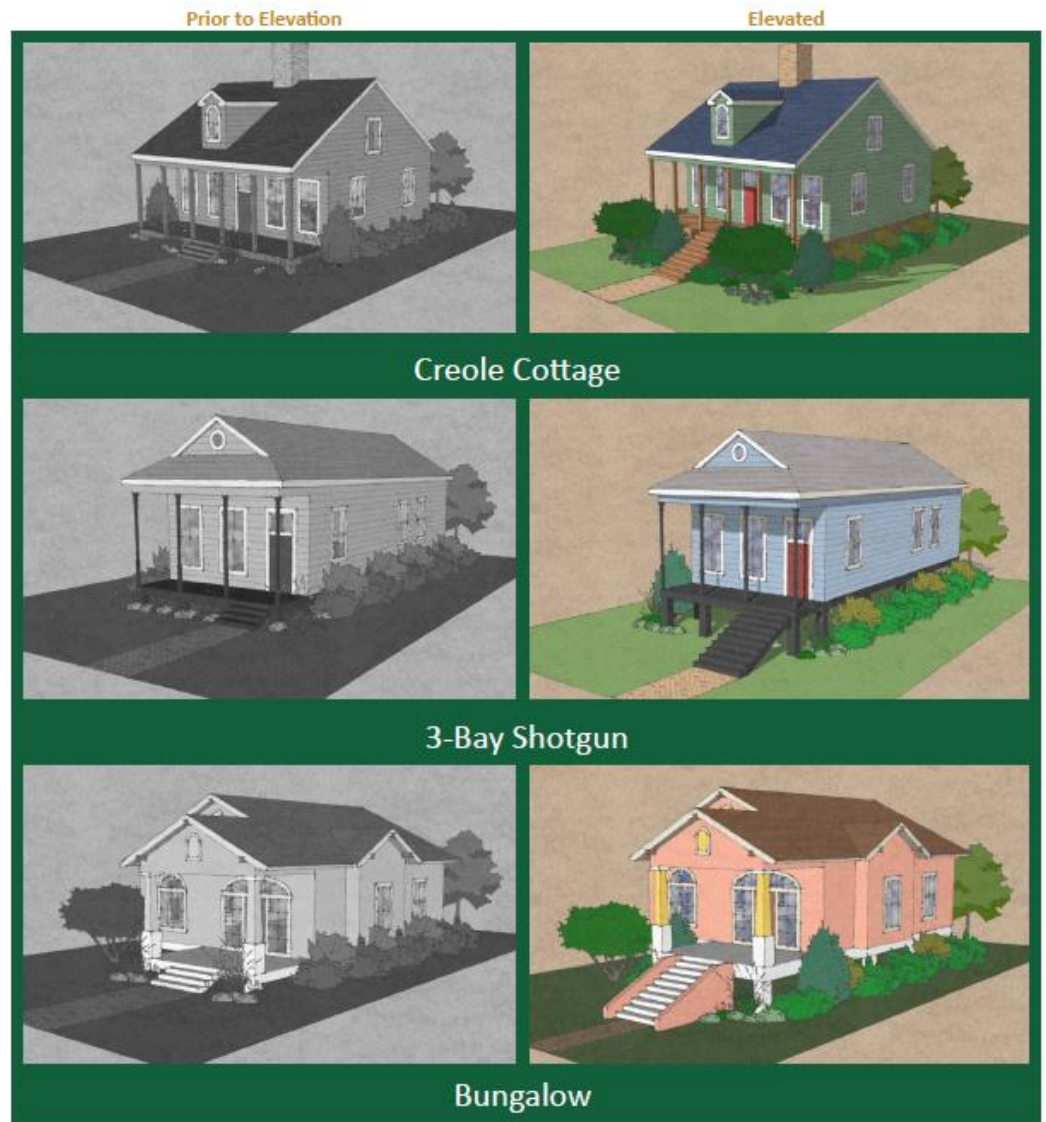
Section 5: Elevation Design – Next Steps: Summarizes the process for designing a new elevation plan and illustrates elevation approaches for some of Louisiana's most common historic building types.

Section 6: Elevation Construction: Provides a guide to the basic steps in building elevation and describes the most common elevation techniques, including extending existing piers or walls, whole house elevation, open foundation (piers, posts, columns, and pilings), slab elevation, slab separation, wall extension, and hybrid elevation.

Section 7: Commercial Buildings: Discusses elevation and alternative methods, such as the integration of interior stairs and exterior stair insets. This section also includes two commercial building case studies, one highlighting wet flood proofing techniques and the other illustrating principles of dry flood proofing.

Section 8: Contemporary Elevated Buildings: Illustrates the next generation of elevated building design through contemporary architectural examples by the Make It Right Foundation, Global Green and Build Now.

Section 9:  
Resources: Includes Architectural Types, Styles and Features, National, State and Local reference materials for use in designing an elevation plan.

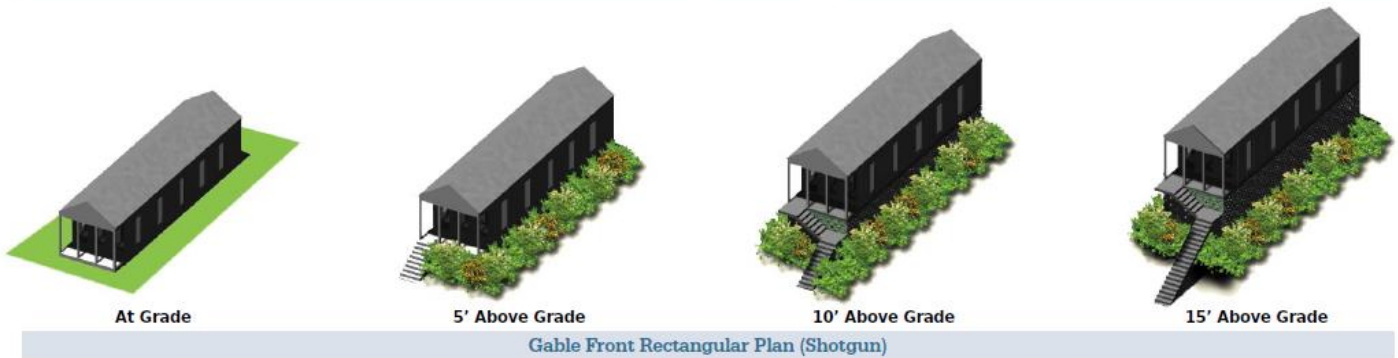


Source: Louisiana Elevation Design Guidelines

## MISSISSIPPI: Elevation Design Guidelines for Historic Homes in the Mississippi Gulf Coast Region

These Guidelines have been developed to ensure that both individual historic buildings, and historic buildings within historic districts, are preserved for future generations.

The purpose of this design manual is to provide recommended elevation design guidance for the rehabilitation of historic buildings funded through MDA programs. The goal of this effort is to reduce risk from future flood events through elevation, and to preserve the physical integrity and character of historic buildings. Specifically, one of the most important outcomes of this effort is to limit the total height of elevation for historic buildings so they maintain their historic character in relation to other historic buildings within each local historic district, thus protecting the architectural qualities of each historic district as a whole.<sup>3</sup>



Source: Mississippi Elevation Design Guidelines

<sup>3</sup> Elevation Design Guidelines for Historic Homes in the Mississippi Gulf Coast Region

## CALIFORNIA: Marin Ocean Coast Sea Level Rise Adaptation Report

The Marin Ocean Coast Sea Level Rise Vulnerability Assessment identifies vulnerabilities of parcels and buildings, transportation, utilities, working lands, natural resources, recreation, emergency services, and historic and archaeological resources. The objective of this report is to present options for increasing resiliency in existing natural and built assets and systems in the face of increased SLR and coastal storms. Strategies, which maximize environmental benefits, social equity, and economic well-being will be prioritized.

A possible adaptation approach for West Marin is to protect existing homes, businesses and other assets through building elevation, flood proofing, and nature-based strategies with flood protection and habitat benefits in the near- to-medium term. Additionally community-wide solutions such as elevating/armoring roads and developing shared wastewater treatment systems are recommended for consideration.

In the near term, property owners can elevate or otherwise retrofit structures to be safe from temporary flooding during storms and high tides. The county can facilitate this process through updated Local Coastal Program (LCP) policies that build on the existing regulatory framework for flood hazard areas and that encourage additional elevation for buildings threatened by SLR.

In the medium- to long-term, communities will need to consider the tradeoffs of various adaptation approaches, and decide whether to remain in current locations or consider relocating to safer areas. Flood insurance rates and coastal armoring mitigation requirements are anticipated to increase in the coming years, which may influence property-owner decisions more than development regulations.<sup>4</sup>

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<sup>4</sup> Marin Ocean Coast Sea Level Rise Adaptation Report



# AVENIDA MENENDEZ

ST. AUGUSTINE, FLORIDA

## PROBLEM STATEMENT, CHALLENGES, AND CONCERNS

## OVERVIEW

The Avenida Menendez site already experiences regular or "sunny day" flooding of the avenue itself and on residential property. However, the major damage and structural impact that the site has experiences was sure to storm events. Because of the location along the Matanzas river, as well as the orientation to the Northeast, the site is vulnerable to storm surge.

The gulf stream is only between 5-10 miles off the coast on any given day. As hurricane cyclones move from South to North along the Atlantic coast, their wind cones move counter-clockwise which pushes water East to West, through the St. Augustine Inlet, into the Matanzas River. This surge builds on the shallow areas directly within in the inlet and beats onto the seawall and over onto the properties beyond. Coupled with an incoming tide, this surge can be considerable. The Army Corps of Engineers is required by federal guidelines to maintain a certain depth in the inlet itself for defensible and navigable purposes, lending to a larger entrance for large volumes of surge water.

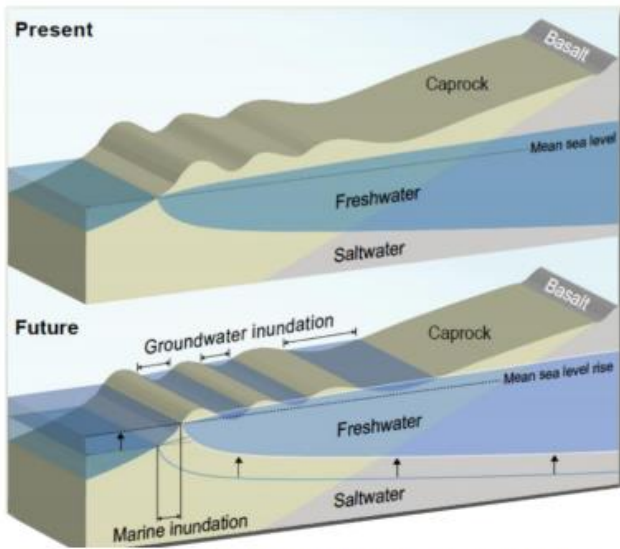


*Blake Shatto, 21, walks past the wreckage of a sunken sailboat, destroyed by Hurricane Matthew, at the Conch House Marina Resort in St. Augustine Beach on Saturday. There was not count yet of the number of homes and businesses damaged. WILL VRAGOVIC | Times*

In 2016, two years after the new wall was completed, Hurricane Matthew pushed a few feet of water over and into the homes behind. Residents within the boundaries of the site reported a high rate of loss from storm surge. The flooding from storm surge has traveled at least 2 blocks from the seawall, reaching St. George Street and beyond.

Interviews with homeowners along the avenue revealed that construction and repair caused by the 2016 flooding are still ongoing, and that the recent round of hurricane

surges have only added to the trouble. Residents reported that not only was storm surge devastating, because water levels remain high it takes longer periods of time for the site and their properties to drain. Meanwhile, other homeowners on the avenue are choosing to raise their homes due to need, perceived risk, and insurance encouragement.



**Figure 19. Conceptual diagram of groundwater inundation, obtained from Rotzoll and Fletcher (2012).**

While the amount of flooding increase and storm frequency for the future cannot be accurately confirmed, there is no question that the flooding problems for this site will increase. With the projected Sea Level Rise of 1.33mm per year and the localized amount of rise expected to exceed the global estimate, the Avenida Menendez site will experience increased nuisance flooding and be at a higher risk for extreme surge damage. As the sea level rises, drainage and standing pools due to diffuse flooding become more impactful.

# VULNERABLE STRUCTURES, INFRASTRUCTURE, AND NATURAL AREAS

Existing infrastructure in the Avenida Menendez site has been designed for and around expected flooding and drainage issues. The seawall which was completed in 2014 is the most recent of infrastructure improvement designed with protective measures in mind. The new concrete and reinforced steel wall runs 1,100 feet, from just south of the Bridge of Lions down to the old Armory at St. Francis Street. The project cost 6.7 million dollars and was the culmination of over ten years of research<sup>5</sup>. Unfortunately, the SLR projections from the city's latest Vulnerability Assessment by engineering consultants Dewberry, show the MHW level sitting at the top of the seawall by 2085<sup>6</sup>. This means that the roadway itself is at great risk of impassible flooding, as well as the streets directly inland. The city has considered revisiting the drainage solutions for the seawall, to enhance the exit of floodwaters. These measures are not certain at this point and they will be costly.



**Legend**  
■ Nuisance flooding, baseline (3.75 ft)  
■ Nuisance flooding, +1.5 ft SLR  
■ Nuisance flooding, +3 ft SLR

While the seawall and residential structures comprise the totality of the Avenida Menendez site, its natural area concern should be the Matanzas River itself. The flooding runoff flows directly into the river and the city should be considering the types of materials that join urban runoff. Furthermore, the wall prevents typical flora of the area such as Sea Oat or Mangrove forest, which reduces erosion. Because of this, building up natural barriers on the river-side of the wall with material such as artificial reef or oyster bars would be advisable. A natural barrier would provide protection against

surge force on the wall, as well as cause breakwater to happen farther out from the waterfront homes.

Adding to the site considerations, Avenida Menendez is a valuable heritage resource. The built environment of this site contains elements of the earliest European settlement in the country and therefore requires a high level of responsibility. There might be considerable archaeological material below the private residences along this street. Because this area is so valuable, its vulnerability should be doubly considered.

<sup>5</sup> City of St. Augustine, 2016

<sup>6</sup> Vulnerability Assessment, Dewberry Engineers. Source: City of St. Augustine

Additionally, property prices along the Avenida Menendez waterfront site are above average in the city<sup>7</sup>. This not only shows the statement of possible loss but reveals that there are varying expectations about risk and exposure. The value of property is only one part of the big picture. As discussed in the context of this paper, the Avenida Menendez is iconic and representative. It is a throughway for tourists and residents alike. It is in the interest of the city and all tax-payers to consider solutions for this waterfront site and explore all options. Because evidence shows that the seawall and protective measures are not able to protect against all scenarios, solutions for private homeowners will most likely come from private decision-making. However, city regulation and guidelines can work to direct and organize best practices and consistency.

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<sup>7</sup> St John's County Property Appraiser's Office



## EXISTING HISTORIC PRESERVATION GUIDELINES

The City of St. Augustine has already put together several great documents to set standards for historic preservation within their city. For this report, we have reviewed and summarized the main points that have influenced our adaptation strategies for the Avenida Menendez site.

### Historic Properties on St. Augustine Town Plan Historic District (Avenida Menendez Section)

Review of information during the historic investigation for the Avenida Menendez Seawall project by URS Architectural Historians meeting the *Secretary of the Interior's Professional Qualification Standards* resulted in the identification of twenty-seven historic properties within the Areas of Potential Effect. Of these, two properties, the St. Augustine Town Plan Historic District (SJ00010) and the Alvarez House (SJ00010G), are currently listed in the National Register of Historic Places (NRHP). One property, the Avenida Menendez Seawall (SJ04971), was formally determined eligible for listing in the NRHP in 2003-2005. The remaining twenty-four properties are located in the St. Augustine Town Plan Historic District. These properties were evaluated and determined to be contributing resources to the Historic District, and therefore, were considered to be listed in the NRHP. Of these twenty-four properties, eight were also determined to be individually eligible for listing in the NRHP.<sup>8</sup>

### To be listed on the National Register of Historic Places, a building typically must be 50 years old or older and:

- A. associated with events that have made a significant contribution to the broad patterns of our history; or
- B. associated with the lives of persons significant in our past; or
- C. embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction [historic districts]; or
- D. have yielded, or may be likely to yield, information important in prehistory or history.

Listing in the National Register does not, in itself, impose any obligation on the property owner or restrict the property owner's basic rights to use the property. It does, however, encourage the preservation of historic resources in four ways:

- 1. by providing official recognition of the historic significance of the property and encouraging consideration of its historic value in future development planning;

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<sup>8</sup> St. Augustine Seawall. City of St. Augustine, St. Johns County, Florida. July, 2011

2. by imposing limited protection from activities involving funding, licensing or assistance by Federal agencies that could result in damage or loss of the property's historic value;
3. by making the property eligible for Federal financial incentives for historic preservation; and
4. by making the property eligible for the local Historic Preservation Property Tax Exemption.<sup>9</sup>

## HISTORIC PRESERVATION ZONES <sup>10</sup>

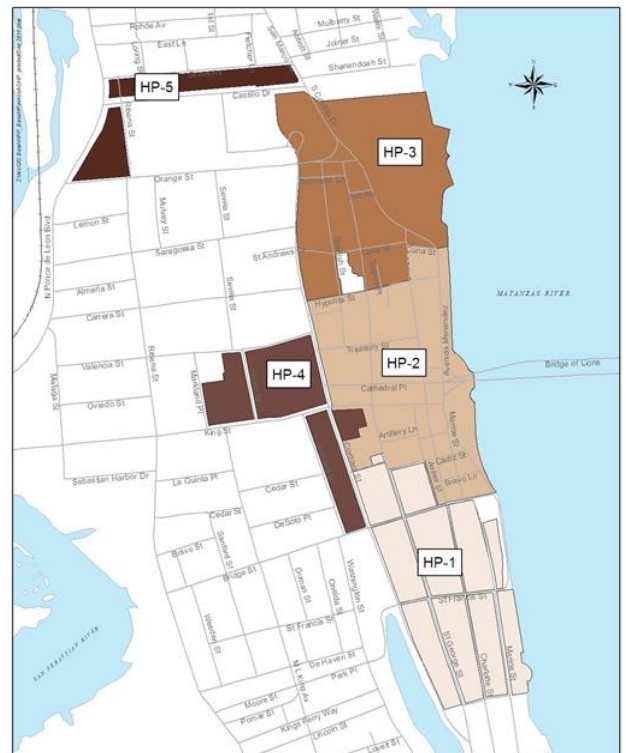
Historic Districts are also divided into preservation zones that further divide the districts in order to have a better understanding of the types of structures that should be built within each zone. The Avenida Menendez site is located within two Historic District Zones. These zones are HP-1 and HP2 and are defined as follows:

### Historic Preservation-One (HP-1)

The predominant existing land uses in this district are public institutions and residential properties. Institutional uses incorporate almost half of the area of HP-1. Major institutions include churches, schools, military facilities, and museums such as the St. Augustine Historical Society. Single-family residential uses dominate south of St. Francis Street and along the bay front. Multifamily residential uses dominate north of St. Francis Street and west of Marine Street. Existing commercial uses consist of bed and breakfast inns and professional offices. This district is the southern portion of the City of St. Augustine National Register District. Several of the oldest surviving Spanish Colonial buildings are located within HP-1.

### Historic Preservation-Two (HP-2)

The predominant existing land uses in this district are commercial and residential. Most commercial uses are tourist oriented retail, service and lodging establishments. Banking and office uses are also present. Single-family residential uses are located mostly south of the Plaza while multifamily residential uses are scattered throughout the district. This district is the central portion of the City of St. Augustine National Register District.



**St. Augustine Historic Preservation Zones**  
 Source: ST. Augustine Architectural Guidelines for Historic Preservation

<sup>9</sup> Architectural Guidelines for Historic Preservation. Prepared by the Planning and Building Division. City of St. Augustine, Florida. Fourth Edition, October, 2011. Pg. 17

<sup>10</sup> Architectural Guidelines for Historic Preservation. Prepared by the Planning and Building Division. City of St. Augustine, Florida. Fourth Edition, October, 2011. Pg. 23-25

## ARCHITECTURAL GUIDELINES FOR HISTORIC PRESERVATION<sup>11</sup>

The Architectural Guidelines for Historic Preservation were originally adopted by the City of St. Augustine Commission in 1984. They were revised in 1989 and then again in 1997.

The City of St. Augustine defines the purpose and scope of the guidelines as follows:

The Future Land Use Element and the Comprehensive Plan establishes the City's intent and objectives regarding land uses and development. The Historic Preservation Element of the Comprehensive Plan establishes the City's intent and objectives regarding historic preservation.

The City Code implements the Future Land Use Plan by establishing specific zoning districts and development regulations including permitted uses, lot dimensions and area, lot coverage, building size and height, required yards (setbacks), parking, landscaping, outdoor displays of merchandise, building codes and environmental protection.

Architectural guidelines are basic standards used to review, direct and regulate rehabilitation and maintenance, new construction and demolitions in the locally designated historic preservation zoning districts. The purpose of historic preservation in general and of these architectural guidelines in particular is to protect and preserve the rich architectural heritage and the visual public character of St. Augustine. These guidelines do not address the uses of land or the interior of buildings, but do regulate the exterior architectural elements of structures, buildings, objects and sites.

## SECRETARY OF INTERIOR'S STANDARDS TREATMENTS<sup>12</sup>

The Secretary of the Interior's Standards' suggested series of treatments include stabilization, restoration, reconstruction, remodeling, rehabilitation, and finally relocation. These treatments are defined on the St. Augustine Architectural Guidelines for Historic Preservation as follows:

### Stabilization

Stabilization is done to re-establish the weather tight and structural integrity of the building, particularly if the building is unsafe or deteriorated. Stabilization measures include repairing or covering roofs and windows so that rain cannot penetrate the interior, extermination of termites and other wood boring pests, protecting the property from vandalism, addressing structural problems, and other work that will prevent further deterioration.

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<sup>11</sup> Architectural Guidelines for Historic Preservation. Prepared by the Planning and Building Division. City of St. Augustine, Florida. Fourth Edition, October, 2011. Pg. 5

<sup>12</sup> Architectural Guidelines for Historic Preservation. Prepared by the Planning and Building Division. City of St. Augustine, Florida. Fourth Edition, October, 2011. Pg. 111-112

## Restoration

Restoration of historic material begins with the least degree of intervention possible, such as patching, piecing in, splicing, consolidating, or otherwise reinforcing or upgrading material according to recognized preservation methods. Restoration entails detailed research into the history, development and physical form of a building, skilled craftsmanship, and attention to detail. The original use is generally maintained or interpreted, as in the case of a museum.

## Reconstruction

Reconstruction entails reproducing, by new construction, the exact form and detail of a vanished building or part of a building, to its appearance during a specific time in its history. Reconstruction is recommended only when there is adequate historical, pictorial or physical documentation so that a building or feature can be adequately reproduced. St. Augustine Guidelines state that a new feature is appropriate when an entire interior or exterior feature is missing. Where an important architectural feature is missing, its recovery is always recommended in the guidelines as the preferred course of action.

## Remodeling

Remodeling is an approach in which alterations or repairs are undertaken with little or no regard for the overall design and individual features of an historic building. During the course of remodeling, the historic character of a building is usually lost or diminished. Remodeling is not a recommended approach.

## Rehabilitation

Rehabilitation is the process of repairing or altering an historic building for an efficient contemporary use while retaining its historic features. Rehabilitation includes structural repairs, repairing roofs and exterior finishes, painting and upgrading mechanical systems. It frequently involves changes of use. These changes may result in physical alterations, such as additions, expanded parking, and measures to comply with contemporary health and safety code requirements. Such new additions should be avoided, if possible, and considered only after it is determined that those needs cannot be met by altering secondary, non-character-defining interior spaces. Sensitive rehabilitation results in changes that do not negatively impact the historic character of a building and its setting.

## Relocation

Relocation refers both to removing all or part of a building or structure from one property and placing it on a different property, and also to shifting the location or orientation of all or part of a building or structure on the same property.

## SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION AND MAINTENANCE OF HISTORIC BUILDINGS<sup>13</sup>

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment. [Compatible New Use]
2. The historic character of the property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided. [Retention of Distinguishing Architectural Character]
3. Each property shall be recognized as a physical record of its time, place and use. Changes that create false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.
4. Most properties change over time; those changes have acquired historic significance in their own right shall be retained and preserved. [Retention of Significant Later Alterations and Additions]
5. Distinctive features, finishes and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved. [Sensitive Treatment of Distinctive Features and Craftsmanship]
6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of the deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence. [Repair or Replacement of Deteriorated or Missing Architectural Features Based on Historic Evidence]
7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible. [Cleaning with the Gentlest Possible Method]
8. Significant archaeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken. [Protection and Preservation of Significant Archaeological Resources]
9. New additions, exterior alterations, or related new constructions shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment. [Compatible Contemporary Design for New Alterations and Additions]

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<sup>13</sup> Architectural Guidelines for Historic Preservation. Prepared by the Planning and Building Division. City of St. Augustine, Florida. Fourth Edition, October, 2011. Pg. 113-114

## RESIDENTS' CONCERNS AND PUBLIC INPUT



“As a resident in this area you have an obligation to try to maintain the integrity of the city and the older homes as best as you can”

-Paul Thompson

The residents of the Avenida Menendez waterfront historic district feel a sense of pride towards their home and their role as stewards of historic structures. Through conversations with many of the local residents, a collection of core values emerged. With an emphasis on *authenticity, history* and *community connections*, the residents of Avenida Menendez feel that homeowners throughout the historic district have a responsibility to maintain the character and appearance of their homes, for they are each uniquely a piece of history with narratives worth capturing. Overall, the Avenida Menendez waterfront is a classic illustration of the variety of structures that make up St. Augustine, and as effects of climate change advance the city and its citizens have a duty to safeguard historic memorabilia in any way possible.

In the process of mitigation and adaptation, it is important to the residents that building guidelines ensure that a sense of authenticity is preserved. In practice, this would require that there is communication amongst homeowners, and that the scale of mitigation projects be determined in relation to other structures on the block.

Many homeowners and residents along Avenida Menendez have expressed that they often do not concern themselves with thoughts of hurricanes or sea level rise until they are faced with warnings from the news or city. In an effort to stimulate proactive preparation, the city must engage with residents prior to the hurricane season, and clearly communicate safety expectations. This also reinforces that the emotional capacity of residents along the waterfront must be strengthened. In a state of panic, residents will not be able to prepare properly, therefore this must be a sustained yearly effort on the part of community members, powerbrokers, and other relevant agencies. Avenida Menendez residents continuously expressed their gratitude for the city's efforts, and shared that they feel the city is a source of resources. This community expectation can be fostered through thorough communication of possible grants, partnerships and community strategies.



## AVENIDA MENENDEZ

ST. AUGUSTINE, FLORIDA

# ADAPTATION STATEMENT, CHALLENGES, AND CONCERNS

# GUIDING PRINCIPLES FOR PROPOSED DESIGN STRATEGIES



The research we have done for this report has helped us develop a series of recommendations that follow the standards set by governing local, state, and federal laws, regulations, and policies. We aim to propose a set of guidelines that illustrate the design options for the community to sensibly adapt the existing infrastructure and put buildings out of harm's way. These options will help the City of St. Augustine mitigate against sea level rise and will also help preserve the historic elements of invaluable properties located within its historic districts.

This report focuses on three adaptation strategy options. These options are used to look at the larger scale of the city which includes the Avenida Menendez Sea Wall, and the smaller scale which takes a closer look at the architecture of the site including its historic houses. The Protect Adaptation Strategy will be used at the larger scale of the city. The Accommodate Adaptation Strategy will be used at the smaller scale, while the Retreat Adaptation Strategy is a last resort option the City of St. Augustine should take into consideration since it will be a strong option to consider in future decades. This report does not focus on talking about the Retreat Adaptation Strategy, instead, it focuses on the Protect and Accommodate Adaptation Strategy Options that will serve as guidelines for the rest of the St. Augustine Historic District.

## ADAPTATION STRATEGY OPTIONS<sup>14</sup>

### Protect:

Protection strategies are those that employ some sort of engineered structure or other measure to defend development (or other resources) in its current location without changes to the development itself. "Hard armoring" refers to engineered structures such as seawalls, revetments, and bulkheads to defend against coastal hazards like wave impacts, erosion, and flooding. Soft armoring includes nature-based solutions such as horizontal levees, wetland restoration, and dune restoration.

### Accommodate:

Accommodation strategies employ methods that modify existing developments or design new developments to decrease hazard risks and thus increase the resiliency of development to the impacts of SLR. On an individual project scale, these accommodation strategies include actions such as elevating structures, retrofits, and/or the use of materials meant to increase the strength of development, building structures that can easily be moved and relocated.

### Retreat:

Managed retreat allows the shoreline to advance inward unimpeded. As the shore erodes, buildings and other infrastructure are either demolished or relocated inland.

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<sup>14</sup> Marin Ocean Coast Sea Level Rise Adaptation Report. Pg. 60-62





## AVENIDA MENENDEZ

ST. AUGUSTINE, FLORIDA

# ADAPTATION OPPORTUNITIES AND DESIGN SOLUTIONS

## OBJECTIVES

This report is proposing solutions in regulatory administration of adaptive design. The location and challenges which this site faces are beyond what measures of protection can provide, therefore the strategy must be adaptive. The following solutions are structured with the management of change in mind. As stated, because this is a historic and archaeological zone, and highly culturally valuable, managing the impacts of natural change and guiding man-made change is essential to resiliency. This strategy is either long-term or permanent, with the only feasible option beyond change being a managed retreat. Because the negative side of the strategy is that change will be permanent, the first step in this proposal is documentation. The positive aspect of this process, including the documentation, lies in the opportunity to learn more about our past and inform our future decisions. The city of St. Augustine already strongly supports documentation of its past and has greatly invested in adaptive engineering, therefore changing the approach to adaptive planning and treatment of historic resources is not out of reach.

# INFORMING PHYSICAL DESIGN SOLUTIONS

## DOCUMENTATION: Informs Adaptation Strategy Options

Documentation is the first and most important step for mitigation in this district. Documentation is essential because it will help evaluate the need for adaptation and for making informed decisions over the management of change. Through documentation, there is great opportunity to collaborate with multiple organizations, such as Envision Heritage at the University of Florida, The Flagler College Archaeology Program, the Florida Public Archeology Network, and many others.

Documentation could include inventorying historic sites with laser scanning, lists, photographs, and descriptions. The results could help in revising and expanding historic district boundaries. In addition, an updated study could: inform future SLR and climate change vulnerability assessments to more fully understand the extent of threatened historic resources; inform future adaptation planning for historic resources; and document the resources in case coastal hazards damage or destroy the structures.

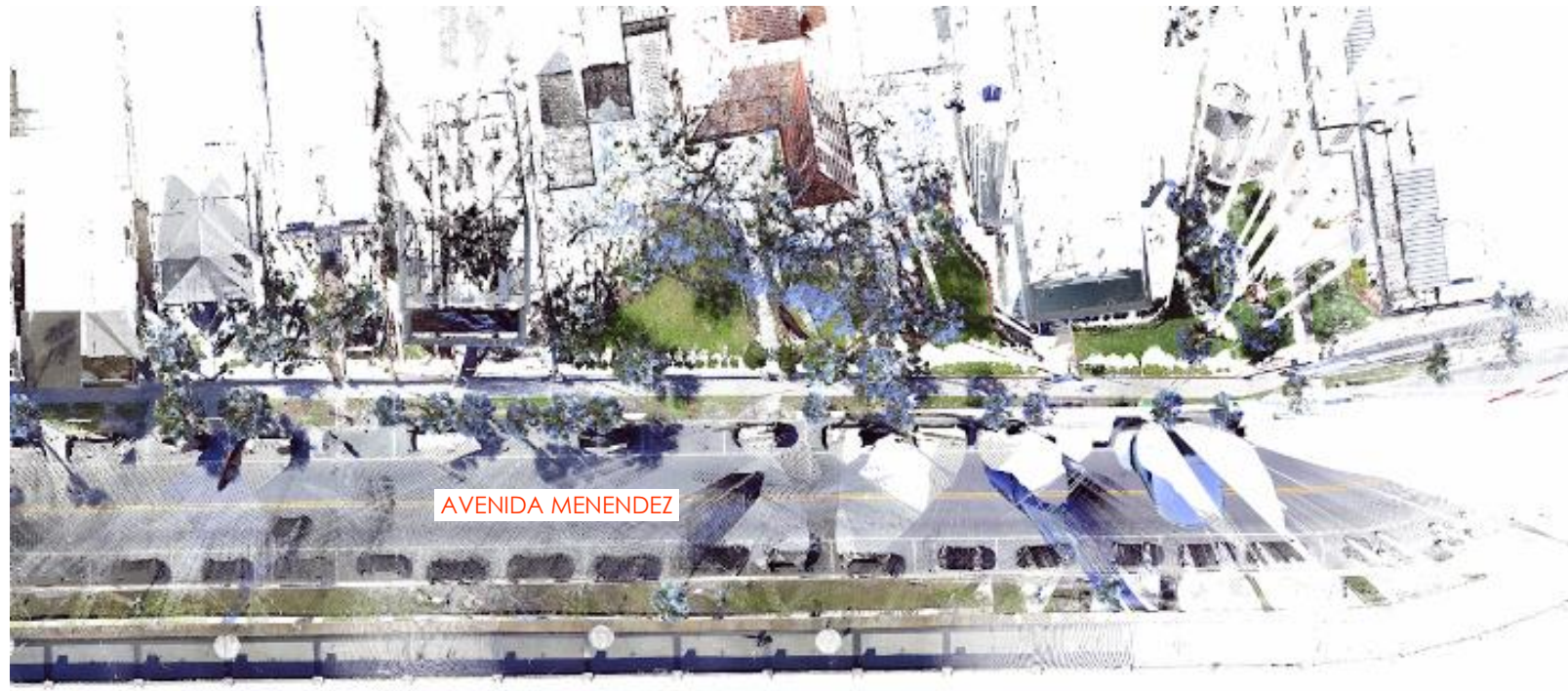
This report focuses on a specific documentation tool: 3D laser scanning. 3D laser scanning is an emerging technology that the UF Envision Heritage team uses to capture as-built conditions. The technology was employed for this report to start the documentation process for the Avenida Menendez site. 3D laser scanning aided by traditional documentation techniques will not only show a new way of seeing things that have not been considered before, but it will also add invaluable information to the archives of St. Augustine history. By building a complete digital model of the site—and later on, the whole St. Augustine Historic District—laser scanning could be used to analyze measured information of the site's infrastructure and architecture, and to visualize the potential risk of sea level rise and building elevation changes. Most importantly, the orthographic images can be used to evaluate options for protecting historic structures. In addition, the city will have accurate spatial imagery for reference in the future if needed.



Avenida Menendez Rendered Perspective View



Avenida Menendez Rendered Site Elevation A



Avenida Menendez Rendered Site Plan A



Avenida Menendez Rendered Legend



Avenida Menendez Rendered Site Elevation B



Avenida Menendez Rendered Site Plan B



Avenida Menendez Rendered Legend

# PHYSICAL DESIGN SOLUTIONS

## ADAPTATION STRATEGY OPTIONS

### ACCOMMODATION STRATEGIES: Smaller Scale

Based on documentation that has already been done by the City of St. Augustine, we have a list of 28 contributing historic resources located in the district.

The Secretary of the Interior's Standards for the Treatment of Historic Properties provide preservation principles and guidelines for physical changes made to historic properties, but it does not take into consideration sea level rise and they do not address flood adaptation measures like building elevation. These guidelines were designed to protect the historic properties from insensitive alterations, but failure to make any adaptations to flood-prone structures may lead to a total loss of the buildings themselves.

The main objective of this report is to set standards for adaptation that the residents can adopt to protect the city's architecture from flooding. Keeping this in mind, we are proposing a few adaptive measures to inform residents of their options, to set standards for consistency, to reduce flood risk and decrease flood damages while trying to retain as much integrity of the historic structures as possible.

In general, we recommend short term design strategies like wet flood proofing, reinforcing existing boundary walls, upgrading drainage, and installing removable flood walls to potentially reduce flood risk. However, since there is a mosaic of architectural styles that include Wooden Structures on Pier Foundation, Wooden Structures on Perimeter Foundations, Coquina Structures, and Structures on Slab Foundations, more specific long term design strategies need to be considered and implemented.



Wooden/Pier Foundations



Wooden/Perimeter Foundations



Coquina/Slab on Grade Foundations

## SHORT TERM DESIGN STRATEGIES

Short term design strategies are ones that can be easily employed by the city and its residents in order to modify existing developments and start decreasing hazard risks. These strategies are usually more affordable and faster methods to be resilient against sea level rise. The Benchmark Analysis for this report revealed a few of these design strategies. The National Center for Preservation Technology and Training defines many of these resilient heritage design strategies. We use the Center's definitions in this next section of the report to inform the public about their options and applications.

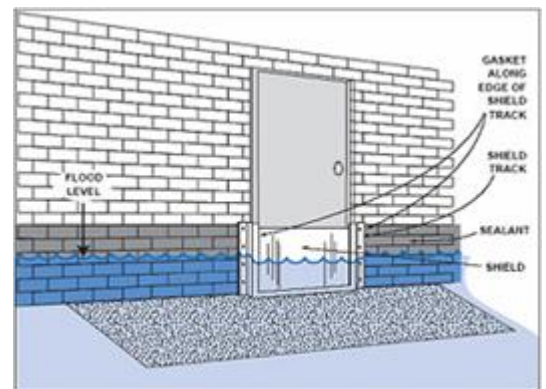
### Wet Flood Proofing:

Involves planning for the home to flood and making preparations to reduce the damage when it happens. Wet flood proofing is achieved by raising utilities, structural components, and contents above Base Flood Elevation. This treatment is only recommended for certain situations, such as a historic building that cannot be elevated or otherwise protected. This treatment requires some work in advance of a storm and more intervention than many of the other options available. Wet flood proofing is typically less expensive than other flood proofing options, but can lead to more interior damage as it allows water to enter and recede. Because the building is purposely allowed to get wet, it may take longer before it can be re-inhabited after a flood.

### Dry Flood Proofing:

The intent of dry flood proofing is to make a building watertight to one foot above Base Flood Elevation or the Design Flood Elevation by applying a waterproof coating or impermeable sheeting to the exterior. All openings, such as windows and doors, must be closed off during a flood with temporary or permanent shields.

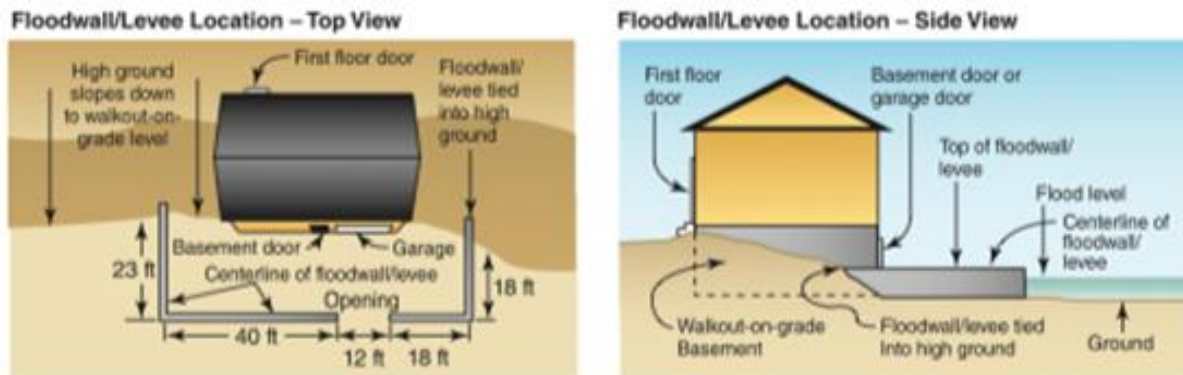
Dry flood proofing is not recommended for historic buildings, as the coatings used are difficult to remove without damaging the underlying materials and would change the appearance of the building where they are applied. Applying a waterproof coating or impermeable sheeting to the existing foundation and exterior walls does not mean they will be able to withstand the physical forces of a flood. The building must still be anchored to its foundation in order to resist the forces of water and movement. This retrofit only works for buildings that are built on grade (i.e., built level with the ground) and have an impervious exterior wall material like brick or concrete. This retrofit also works best only for short flooding events since coatings may deteriorate during extended flooding.



Source: NCPTT

## Permanent levees:

Constructed around the building, permanent levees are another option but can be very large and costly. These are not recommended for historic properties since they diminish the character of the homes. Most of the properties on the Avenida Menendez site already have some sort of levees. Increasing the heights of these levees would change the character of the houses. Levees require an engineer and permits to determine if they are appropriate for a site.



Source: NCPTT

## Drainage:

Part of the task of keeping water out of a historic building is to direct the water away from it. This is done by keeping roofs, gutters, and downspouts in working condition and channeling water collected by these into appropriate subsurface drainage. Grade the soil so that water drains away from the building. Point downspouts away from the building and onto splash blocks when grading alone is not sufficient. Catch basins, trench drains, or perforated French drains may be needed in some cases. For these retrofits, it may be necessary to consult a landscape architect or a civil engineer who can visit the site to determine the best course of action.



## LONG TERM DESIGN STRATEGIES

This report proposes that depending on the type of structure a resident owns, they could have at least two main long term design strategies for adaptation, which are also defined on this section. For example, in the case of wooden or raised structures, amphibious architecture and the permanent elevation of buildings could be protection methods implemented to minimize water damage. In the case of coquina wall structures, removable flood walls or an adaptation of the ground floor levels could take place since these types of structures are more often than not impossible to lift off the ground.

### Retrofit:

Many retrofits can be completed without negatively or significantly affecting historic character. However, there may be instances where the retrofit that best protects the building negatively affects its historic character or features. In those instances, the homeowner and their designer or contractor will have to discuss the best course of action. Owners of buildings with an official historic designation should consult local or state preservation offices to determine if the retrofits are appropriate.<sup>15</sup>

### Building Elevation:

When elevating a building, the recommended first floor elevation is usually determined by Base Flood Elevation (BFE) or a Design Flood Elevation (DFE) for the area. BFE is the height that experts have determined has a 1% chance of being reached or exceeded in any given year. When a home is elevated, steel beams are placed under the first floor to support the building and jacks are used to raise the house. A new foundation is constructed which should meet current building codes and be able to withstand the load of the home and forces from a flooding event.

Houses that are already raised off the ground (buildings with a crawl space) are easier to lift above flood levels. Buildings constructed on a concrete slab are more difficult to elevate and may need additional support or a new floor. To raise a house built on piles, it must first be moved out of the way to allow access for machinery needed to drive, jet, or auger the new piles. New foundations should be designed by a professional structural engineer who will ensure that loads are accurately calculated and foundation wall and sill plate connections are designed correctly. The new foundation must meet current codes and structural systems must be tied together, from the roof to the foundation, to reduce risks from future events.<sup>16</sup>



Source: Louisiana Elevation Design

<sup>15</sup> Marin Ocean Coast Sea Level Rise Adaptation Report

<sup>16</sup> National Center for Preservation Technology and Training. Building Elevation Definition.

## Amphibious Architecture:

Amphibious architecture refers to an alternative flood mitigation strategy that allows an otherwise-ordinary structure to float on the surface of rising floodwater rather than succumb to inundation. An amphibious foundation retains a home's connection to the ground by resting firmly on the earth under usual circumstances, yet it allows a house to float as high as necessary when flooding occurs. Amphibious foundations make homes resilient; resilient homes are the bases for resilient communities.<sup>17</sup>



Source: Buoyant Foundation Project

## Buoyant Foundation:

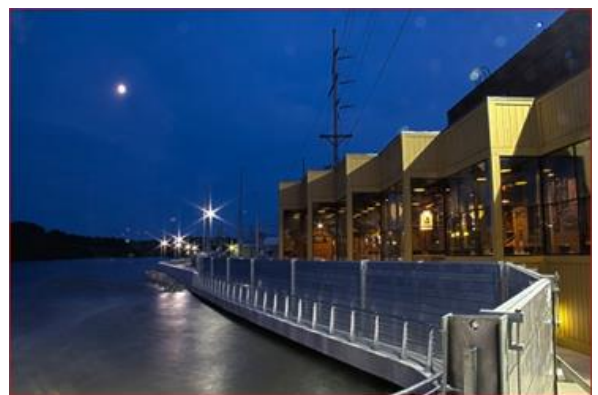
A buoyant foundation is a particular type of amphibious foundation that is specifically designed to be retrofitted to an existing house that is already slightly elevated off the ground and supported on short piers. The system consists of three basic elements: buoyancy blocks underneath the house that provide flotation, vertical guideposts that prevent the house from going anywhere except straight up and down, and a structural sub-frame that ties everything together. Utility lines have either self-sealing 'breakaway' connections or long, coiled 'umbilical' lines. Any house that can be elevated can be made amphibious.<sup>18</sup>



Source: Buoyant Foundation Project

## Invisible Flood Control Wall:

Removable flood protection system that is composed of gasketed aluminum planks and steel posts, which are quickly mountable and watertight. Steel base plates are cast into concrete foundations and are the only permanently installed feature of the flood barrier system. Applications for the system include perimeter walls, flood closures, and flood proofing.<sup>19</sup>



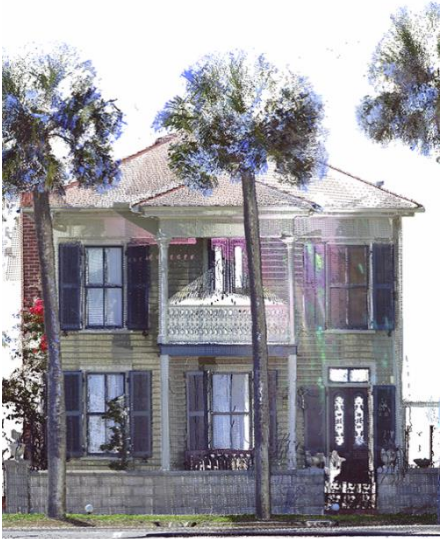
Source: Flood Control America

<sup>17</sup> Buoyant Foundation Project. Amphibious Architecture Definition.

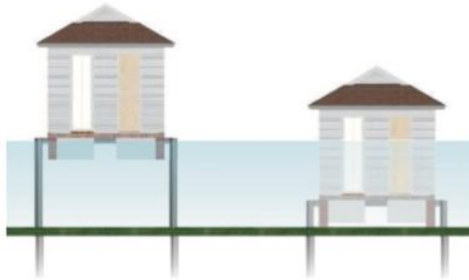
<sup>18</sup> Buoyant Foundation Project. Buoyant Foundation Definition.

<sup>19</sup> Flood Control America. How the Flood Wall Works.

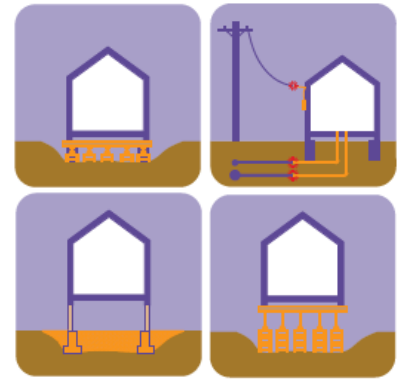
## LONG TERM DESIGN STRATEGIES FOR ADAPTATION



Wooden or Raised Structures



Amphibious Foundations



Permanent Elevation



Coquina Structures



Removable Flood Walls



Adapt Ground Level

As mentioned earlier on this section, the main objective of this report is to set standards for adaptation that the residents can adopt to protect the city's architecture from flooding. The short and long term design strategies we have defined are meant to help the city and its residents reduce flood risk and decrease flood damages to their properties while trying to retain as much integrity of the historic structures as possible.

This report seeks to inform residents about their strategy options, but it also seeks to stress the idea that any adaptation strategies should abide by all local, state, and federal building codes and regulations. Later on the Implementation section of this report, we will go further in detail to explain some of the allowances that are made for historic buildings to meet current codes. We want to stress, that homeowners should follow the City of St. Augustine Regulations and most of the retrofits we have defined in this section require a licensed architect or engineer to ensure they do not compromise the structural integrity of a building, so always consult with a professional before taking on adaptation strategies to mitigate sea level rise.

## PURPOSE OF ARCHITECTURAL DESIGN GUIDELINES



On the previous section, we talked about adaptation strategies that the City of St. Augustine and its residents could implement to mitigate sea level rise. All of the strategies presented affect the historic structures located within the Avenida Menendez in a way or another so Architectural Design Guidelines should be implemented in order to set standards for consistency throughout the site and the district as a whole. Following the Louisiana and Mississippi Design Guidelines, we have come up with a list of considerations that could aid in protecting the historic neighborhood from insensitive alterations that would affect the integrity of the historic properties.

### Site Considerations

- Site Elevation and Topography
- Parcel Configuration and Access
- Building Footprint and Orientation
- Adjoining/Adjacent Property Considerations
- Driveways, Parking and Garages
- Landscape Screening and Enhancement

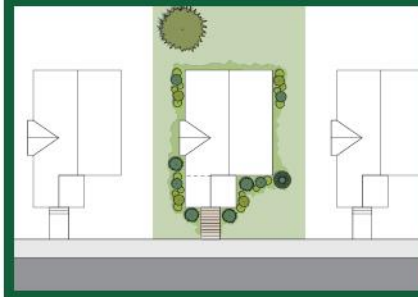
### Building Considerations

- Historic Neighborhood Context
- Potential Elevation Alternatives
- Typical Historic Building Types and Styles
- Composition and Scale
- Existing Façades
- Stairs and Porches
- Foundations and Screening
- Fences and Walls

### LANDSCAPE FOUNDATION SCREENING



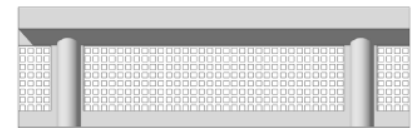
**Bungalow**



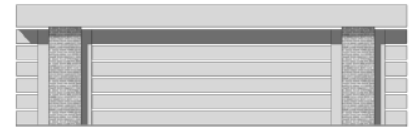
### LATTICE FOUNDATION SCREENING



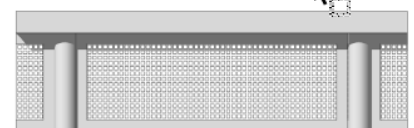
Elevation with no screen



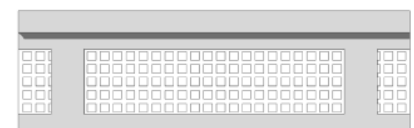
Elevation with lattice covering piers



Elevation with louver screen panel



Elevation with fine pattern lattice screen panel



Elevation with bold pattern lattice screen panel

Source: Louisiana Elevation Design Guidelines

We recommend that the City of St. Augustine includes a sub-set of Architectural Design Guidelines targeted specifically to address adaptation strategies which purpose is to mitigate sea level rise. These Guidelines then could be presented to any property owner planning to make changes to their historic property. Specifically, these Guidelines should address adaptation strategies like the elevation of buildings where many of the foundations would be exposed and appropriate architectural screenings of the foundations like landscape screening and lattice screen panels should be used in order to have less adverse effect on the historic character of the property that is being elevated. This set of Guidelines should consider the neighborhood context, treatment of elevation, and historic fabric interface to produce the best, individualized approach for a given historic building.

## PROPOSED POLICIES AND LEGAL ANALYSIS



After reviewing the City of St. Augustine's Comprehensive Plan, Adaptation Plan, Architectural Design Guidelines, Historic Preservation Plan, and other policy resources, we are impressed with the City's plans for resiliency. There are several legal and policy considerations specific to our site and design proposals, including revisions to the City of St. Augustine's Comprehensive Plan, considerations with revisiting building height restrictions in the City's historic districts, additional guidelines for and participation with the Historic Preservation Tax Exemption (ad valorem) program, and archeological opportunities with adaptive changes to historic buildings.

### INCORPORATING SEA LEVEL RISE CONSIDERATIONS INTO THE COMPREHENSIVE PLAN

Our project area includes two Historic Preservation Districts, so our legal and policy considerations largely address concerns with balancing the City of St. Augustine's Historic Preservation goals with adaptation to sea level rise. The historic resources of St. Augustine define the city and play an important role in driving the tourism economy.<sup>20</sup> The overarching challenge with historic buildings in our project site is determining how to balance adaptive strategies to improve their resiliency while maintaining the historic "location, circumstance, character, and construction" of these buildings in their districts.<sup>21</sup> The Adaptation Plan for St. Augustine and the Historic Element of the city's Comprehensive Plan address many of these issues.<sup>22</sup>

The current goal of the Historic Preservation Element of the Comprehensive Plan is to "[m]aintain and enhance the historic integrity and ambiance within the City of St. Augustine while encouraging economic growth and the identification, preservation, continued use and adaptive reuse of existing historic structures."<sup>23</sup> The objectives within the Historic Preservation Element support this goal but do not address concerns about the impacts of sea level rise. For this reason, the Historic Preservation Element should incorporate recommendations from the Adaptation Plan to improve the City's ability to make decisions about permitting adaptive changes to improve the resiliency of historic resources.<sup>24</sup> Under the recommendations of the Adaptive Plan, the Historic Preservation Element goal should consider incorporating language like the following:

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<sup>20</sup> Florida Community Resiliency Initiative Pilot Project, Adaptation Plan for St. Augustine, Florida. Adaptation Plan, Appendix C: Preliminary Workshop Summary, C-1 to C-2 (May 2017).

<sup>21</sup> *Id.* at 30.

<sup>22</sup> Florida Community Resiliency Initiative Pilot Project, Adaptation Plan for St. Augustine, Florida (May 2017); City of St. Augustine 2030 Comprehensive Plan, Evaluation and Appraisal Report-Based Amendments (June 2011).

<sup>23</sup> City of St. Augustine 2030 Comprehensive Plan, Evaluation and Appraisal Report-Based Amendments, Historic Preservation Element 100 (June 2011).

<sup>24</sup> Florida Community Resiliency Initiative Pilot Project, Adaptation Plan for St. Augustine, Florida. Adaptation Plan, Executive Summary ES-6 (May 2017).

Maintain and enhance the historic integrity and ambiance within the City of St. Augustine *amid changing environmental circumstances* while encouraging economic growth and the identification, preservation, continued use and adaptive reuse of existing historic structures.<sup>25</sup>

Similarly, Objective 3 of the Historic Preservation Element should consider incorporating language as follows:

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.*<sup>26</sup>

Incorporating this language into the Historic Preservation Element of the Comprehensive Plan enables the City of St. Augustine to develop procedural and substantive measures to make decisions about these historic resources in the future. Along with these targeted revisions to the Comprehensive Plan, incorporating guidelines like our adaptive architectural recommendations into the Architectural Guidelines for Historic Preservation will provide a supportive framework for the City of St. Augustine to oversee short-term and long-term adaptive solutions.

## NAVIGATING BUILDING HEIGHT RESTRICTIONS WITH STRUCTURAL ADAPTATION FOR RESILIENCY

Determining the appropriate restrictions on building height is a complicated issue when planning for sea level rise, especially when elevating historic structures in Historic Preservation Districts. The City of St. Augustine provides detailed information on building height restrictions under the zoning regulations for the city.<sup>27</sup> Under St. Augustine's zoning definitions, building height refers to the "vertical distance measured from the base flood elevation as determined by the Federal Emergency Management Agency to the top of the highest point of the roof or parapet" of buildings within "known flood zones and delineated on the Federal Emergency Management Agency Insurance Rate Map."<sup>28</sup> Applying this vertical measurement in Historic Preservation Districts is one of the relevant legal and policy issues specific to our project site.

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<sup>25</sup> Florida Community Resiliency Initiative Pilot Project, Adaptation Plan for St. Augustine, Florida. 4.3.4 Historic Resources 32 (May 2017). (Emphasis added to demonstrate added language that incorporates changing environmental circumstances into the Historic Preservation Element goal).

<sup>26</sup> *Id.* (Emphasis added to demonstrate added language that incorporates changing environmental circumstances into the Historic Preservation Objective).

<sup>27</sup> City of St. Augustine Code of Ordinances, Chapter 28, Article 1- In General, Sec. 28-2. – Definitions (available at [https://library.municode.com/fl/st\\_augustine/codes/code\\_of\\_ordinances?nodetid=PTIICOOR\\_CH28ZO\\_ARTIINGE\\_S28-2DE](https://library.municode.com/fl/st_augustine/codes/code_of_ordinances?nodetid=PTIICOOR_CH28ZO_ARTIINGE_S28-2DE)); Map of Historic Preservation Zones of St. Augustine, available at [http://cms4.revize.com/revize/staugustinefl/document\\_center/PlanningBuilding/Maps/HistoricPreservationZones.pdf](http://cms4.revize.com/revize/staugustinefl/document_center/PlanningBuilding/Maps/HistoricPreservationZones.pdf)).

<sup>28</sup> City of St. Augustine Code of Ordinances, Chapter 28, Article 1- In General, Sec. 28-2. – Definitions [https://library.municode.com/fl/st\\_augustine/codes/code\\_of\\_ordinances?nodetid=PTIICOOR\\_CH28ZO\\_ARTIINGE\\_S28-2DE](https://library.municode.com/fl/st_augustine/codes/code_of_ordinances?nodetid=PTIICOOR_CH28ZO_ARTIINGE_S28-2DE); (The height restriction excludes chimneys, ornamental features, or other building accessories. For buildings outside of delineated FEMA flood zones, vertical distance is measured from the "average contact ground level at the front wall of the building").

The project site for our group falls within two Historic Preservation Districts, zoned as HP-1 and HP-2.<sup>29</sup> The current zoning regulations for the Historic Preservation Districts set height restrictions so that “[n]o portion of peaked roof main buildings or structures shall exceed thirty-five (35) feet, two and one-half (2½) stories. No portion of flat-roofed main buildings or structures shall exceed thirty (30) feet, two (2) stories.”<sup>30</sup> The same building height restriction is reflected in Policy 1.2 of the Historic Element of Comprehensive Plan, with the intent to “[m]aintain the current thirty-five foot height limit on construction within the locally designated historic preservation zoning districts and National Register Districts.”<sup>31</sup> While there are numerous reasons the thirty-five foot height limit is important to maintain the historic character of the buildings and historic districts, this is an obstacle to adaptive designs to improve the resiliency of specific historic structures.

Our proposed design guidelines include recommendations on elevating specific types of historic structures prone to storm surge and flooding to improve their resiliency. After experiencing devastating amounts of property damage after Hurricanes Matthew and Irma, some private homeowners within our project site are taking initiative to modify and elevate their historic homes. Even prior to Hurricane Irma, the City of St. Augustine's Adaptation Plan highlights concerns with relying on FEMA-designated flood zones.<sup>32</sup> Within the workshopping component of St. Augustine's Adaptation Plan, there were concerns that the proposed revisions to FEMA's flood insurance rate maps for the city would reduce the extent flood zones, undermining the base flood elevation property owners previous relied on.<sup>33</sup> In planning for longer timeframes with sea level rise, basing elevation restrictions on FEMA's flood insurance rate maps is a short-term vision for adaptive planning.<sup>34</sup> According to FEMA's website, “FEMA maps coastal flood hazards based on existing shoreline characteristics, and wave and storm climatology at the time of the flood study. In accordance with the current Code of Federal Regulations, FEMA *does not map flood hazards based on anticipated future sea levels or climate change.*”<sup>35</sup> Timeframes are important in comprehensive planning, especially with adaptive planning for sea level rise. While it is difficult to determine which data and analysis resources are appropriate for measuring building height restrictions, sea level rise and other changing environmental conditions should be considered for long-range adaptive planning. Other local governments offer some examples on how to incorporate adaptability into zoning regulations when elevating structures. For example, the City of Key West, Florida, modified their height restriction to incorporate an exception for buildings elevated to meet or exceed FEMA base flood elevation, on the condition that:

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<sup>29</sup> Map of Historic Preservation Zones of St. Augustine, available at [http://cms4.revize.com/revize/staugustinefl/document\\_center/PlanningBuilding/Maps/HistoricPreservationZones.pdf](http://cms4.revize.com/revize/staugustinefl/document_center/PlanningBuilding/Maps/HistoricPreservationZones.pdf)

<sup>30</sup> City of St. Augustine Code of Ordinances, Chapter 28, Article III- Zoning Districts and District Regulations, Division 3- Historic Preservation Districts, Sec. 28-188. - Lot, yard and height requirements for historic preservation districts 1, 2 and 3. (available at [https://library.municode.com/fl/st.\\_augustine/codes/code\\_of\\_ordinances?nodetd=PTIICOR\\_CH28ZO\\_ARTIIIIZODIDIRE\\_DIV3HIPRDI\\_S28-188LOYAHEREHIPRDI123](https://library.municode.com/fl/st._augustine/codes/code_of_ordinances?nodetd=PTIICOR_CH28ZO_ARTIIIIZODIDIRE_DIV3HIPRDI_S28-188LOYAHEREHIPRDI123)).

<sup>31</sup> City of St. Augustine 2030 Comprehensive Plan, Evaluation and Appraisal Report-Based Amendments, Historic Preservation Element 100 (June 2011).

<sup>32</sup> Florida Community Resiliency Initiative Pilot Project, Adaptation Plan for St. Augustine, Florida. Adaptation Plan, Appendix C: Preliminary Workshop Summary, C-1 to C-2 (May 2017); See also *id.* at Appendix A, A-4 and fn. 94.

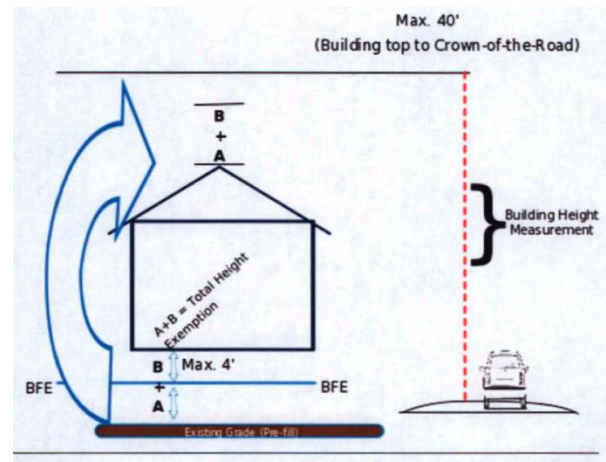
<sup>33</sup> *Id.* at Appendix C: Preliminary Workshop Summary, C-3 (May 2017).

<sup>34</sup> *Id.* at Appendix A, A-4 and fn. 94.

<sup>35</sup> *Id.*; Federal Emergency Management Agency, Coastal Hazard Mapping Questions, available at <https://perma.cc/HYN7-XMY5> (last updated Aug. 17, 2016) (emphasis added).

1. Only the equivalent measure of distance from the existing ground level, prior to infill, to the required base flood elevation of the building, and up to a maximum of four (4) feet above the base flood elevation, may exceed the building height regulations.
2. No exception shall result in a building height that would exceed 40 feet.<sup>36</sup>

Unlike St. Augustine, the City of Key West defines building height as the “vertical distance from the crown of the nearest adjacent street to the highest point of the proposed building.”<sup>37</sup> While this definition of building height measurement is even less considerate of changing environmental conditions than St. Augustine’s, the City of Key West provides a broader exception to elevate structures. The maximum height under the exception in Key West’s ordinance is five feet higher than the zoning restrictions in the City of St. Augustine.<sup>38</sup> The additional flexibility under the City of Key West’s ordinance is just another example of how a coastal city navigated a similar issue with elevating structures.



Source: City of Key West Design Guidelines

There are numerous challenges in determining building height restrictions, especially when debating on elevating historic building to improve their resiliency from the impacts of sea level rise. Beyond the design challenges in preserving the physical integrity and character of historic buildings in historic districts, homeowners in our project site will continue to modify and elevate their structures when faced with storm surges and flooding. The City of St. Augustine is already taking steps to address this complicated issue, and additional adaptive planning will produce building height restrictions and exceptions that work for stakeholders in the historic districts of St. Augustine.

## INCENTIVIZING RESILIENCY IN THE CITY OF ST. AUGUSTINE

In touring our project site, we visited homes where private homeowners were repairing and renovating their homes after suffering flood damage from Hurricanes Matthew and Irma. These homeowners indicated that insurance and private financing funded these repairs and renovations. Rather than reactively adapt or lose historic structures to the impacts of sea level rise, private homeowners can proactively adapt their homes to improve resiliency. Aside from insurance and private financing to repair and renovation historic buildings, property owners in the City of St. Augustine have access to three potential economic

<sup>36</sup> City of Key West, Florida, Code of Ordinances, Art. V. Supplementary District Regulations, Division 3 Area Requirements. Ord. No. 15-07, § 1, 4-7-2015. Sec. 122-1149(d). - Height. (available at [https://library.municode.com/fl/key\\_west/codes/code\\_of\\_ordinances?nodeId=SPBLADERE\\_CH122ZO\\_ARTVSUDIRE\\_DIV3ARRE\\_S122-1149HE](https://library.municode.com/fl/key_west/codes/code_of_ordinances?nodeId=SPBLADERE_CH122ZO_ARTVSUDIRE_DIV3ARRE_S122-1149HE)).

<sup>37</sup> *Id.* at (a).

<sup>38</sup> *Id.*



incentive programs. These programs include the Historic Preservation Tax Exemption (ad valorem) program, the Federal Rehabilitation Tax Credit program for commercial properties, and the 2012 Lincolnville Community Redevelopment Area.<sup>39</sup> For our project site, the Historic Preservation Tax Exemption program, which was adopted by the City in 1995, is of particular interest for rehabilitating and adapting historic buildings impacted by sea level rise. The City of St. Augustine's Architectural Guidelines for Historic Preservation, Comprehensive Plan, and the draft Historic Preservation Masterplan all include information about this program.

The City of St. Augustine's Architectural Guidelines for Historic Preservation provides the most detail about the process of applying for the Historic Preservation Property Tax Exemption.<sup>40</sup> The partial ad valorem tax exemption is available for historic property that is being restored, rehabilitated, or renovated under the guidelines.<sup>41</sup> When applied to qualifying properties, the exemption is from ad valorem taxes levied by the City on "on 100% of the assessed value of the improvement for 10 years."<sup>42</sup> The elements for qualification require that the property is individually listed in the National Register of Historic places, a contributory property to a National Register District, or "designated a historic property or be a contributing property in a locally established historic preservation district."<sup>43</sup> The improvements to the property must be "consistent with the United States Secretary of Interior's Standards for Rehabilitation" and must be "determined by the Historic Architectural Review Board to meet criteria established by the Department of State."<sup>44</sup> For the cost of the improvement, twenty-five percent of the proposed improvement must apply to the exterior or foundation of the structure, and the minimum valuation of the improvement must equal "\$20,000 or 50% of the assessed value of the structure before the improvement, whichever is less."<sup>45</sup>



Source: Michael Boynton

Applications for the program are made prior to starting construction with forms provided by the Planning and Building Division from the Department of State.<sup>46</sup> The plans must be approved by the Historic Architectural Review Board and a building permit from the Planning and Building Division must be issued before starting any construction.<sup>47</sup> The process for reviewing and approving a property under the tax

<sup>39</sup> City of St. Augustine DRAFT Historic Preservation Master Plan, 4.27, 5.32 (DRAFT August 2017).

<sup>40</sup> City of St. Augustine Florida, Architectural Guidelines for Historic Preservation, 4th Ed. 12-13 (October 2011).

<sup>41</sup> *Id.* at 12.

<sup>42</sup> *Id.*

<sup>43</sup> *Id.*

<sup>44</sup> *Id.*

<sup>45</sup> *Id.*

<sup>46</sup> *Id.* at 13.

<sup>47</sup> *Id.*

exemption program is in addition to the building permit review process.<sup>48</sup> After the construction to the property is complete, the Planning and Building Division must inspect the property to ensure compliance and continued maintenance to the property.<sup>49</sup> Finally, in order to activate the tax exemption, the property owner signs an Historic Preservation Property Tax Exemption Covenant agreeing to maintain the improvements during the period of the exemption, and the covenant must be approved by resolution of the City Commission. Once approved, the covenant must be recorded with the deed to the property, which allows the Property Appraiser to activate the tax exemption.<sup>50</sup>

For numerous reasons, this process is lengthy and involves financial risk by property owners relying on this tax exemption. Several buildings in our project site meet the qualifications for eligibility under the program as “contributing propert[ies] in a locally established historic preservation district.”<sup>51</sup> Our interest with this ad valorem tax program is providing an additional source of funding to incentivize sea level rise adaptations to historic buildings in our project site. As noted, the ad valorem tax program already requires that twenty-five percent of the proposed improvement must be to the exterior or foundation of the structure. The City of St. Augustine could incorporate additional architectural guidelines with this program which support adaptations to improve the resiliency of vulnerable structures. For example, the requirement for twenty-five percent of the proposed improvement to apply to the exterior or foundation could incorporate exceptions or additional requirements for flood proofing or elevating eligible buildings. There are numerous ways the City of St. Augustine could amend the architectural guidelines and impose additional requirements to improve the resiliency of historic buildings through the ad valorem tax program.

Under the draft Historic Preservation Master Plan, the City of St. Augustine includes a task of developing informational brochures to inform residents about economic incentive programs.<sup>52</sup> Brochures, along with other forms of informational outreach to potential stakeholders could attract more use of the ad valorem tax program. Another task includes revising the City's Historic Preservation webpage to include direct links to initiatives and programs that benefit historic preservation, with particular attention directed toward the ad valorem tax exemption program.<sup>53</sup> The website for the City of St. Augustine provides some information about the City's historic preservation initiatives but continues to recommend contacting a professional and the Planning and Building Department for more information.<sup>54</sup>

Sections of St. Augustine's Comprehensive plan also reference the Historic Preservation Tax Exemption program. The Housing Element of the Comprehensive Plan includes a policy to educate developers in National Register Districts regarding “the City's Historic Preservation Property Tax Exemption program as well

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<sup>48</sup> *Id.*

<sup>49</sup> *Id.*

<sup>50</sup> *Id.*

<sup>51</sup> City of St. Augustine Florida, Architectural Guidelines for Historic Preservation, 4th Ed. 12-13 (October 2011).

<sup>52</sup> City of St. Augustine DRAFT Historic Preservation Master Plan, 5.33 (DRAFT August 2017).

<sup>53</sup> *Id.*

<sup>54</sup> City of St. Augustine, Historic Preservation Division, (available at [http://www.citystaug.com/government/planning\\_and\\_building/divisions/historicpreservation.php](http://www.citystaug.com/government/planning_and_building/divisions/historicpreservation.php)).

as investigate grants for historic preservation from the State of Florida and the Federal government.”<sup>55</sup> Additionally, the Intergovernmental Coordination Element of the Comprehensive Plan states that the City of St. Augustine “shall coordinate planning activities mandated by the Comprehensive Plan,” including the Historic Preservation Property Tax Exemption Program.<sup>56</sup>

The City of St. Augustine recognizes the importance of investing in its historic resources, as demonstrated in the City’s Architectural Guidelines for Historic Preservation, Comprehensive Plan, and the draft Historic Preservation Masterplan. The City already highlights numerous tasks for improving use of the ad valorem tax program. Revising some of the architectural guidelines for the program to incorporate adaptive designs will improve the resiliency of historic buildings in the City for generations in the future. Lastly, revitalizing public interest in this economic incentive program will encourage more rehabilitation projects in our site, and throughout the City.

## ARCHEOLOGICAL OPPORTUNITIES WITH ADAPTATION: PREPARING FOR THE FUTURE, UNEARTHING THE PAST



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In this last section of legal and policy considerations for our project site we examine the archeological opportunities that will emerge from adaptive change. The City of St. Augustine is one of the few local governments in the country with a municipal Archaeology Program, and the City’s archaeology ordinance provides the framework for the archaeology program and designates specific archaeological zones.<sup>58</sup> As noted on numerous advertisements for the City of St. Augustine, the City is at the site of

the first successful European Settlement in the United States.<sup>59</sup> Our project site falls within Zone 1 and Zone 2 of the archaeological zoning overlays, which includes the site of the original the 16<sup>th</sup> Century downtown

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<sup>55</sup> City of St. Augustine 2030 Comprehensive Plan, Evaluation and Appraisal Report-Based Amendments, Housing Element. 49 (June 2011).

<sup>56</sup> *Id.* at Intergovernmental Coordination Element, Policy 1.5, 86.

<sup>57</sup> Photograph of archaeological investigation under a partially elevated building in our project site. A section of a coquina wall or foundation is visible in the picture. Photo credit: Marty Hylton.

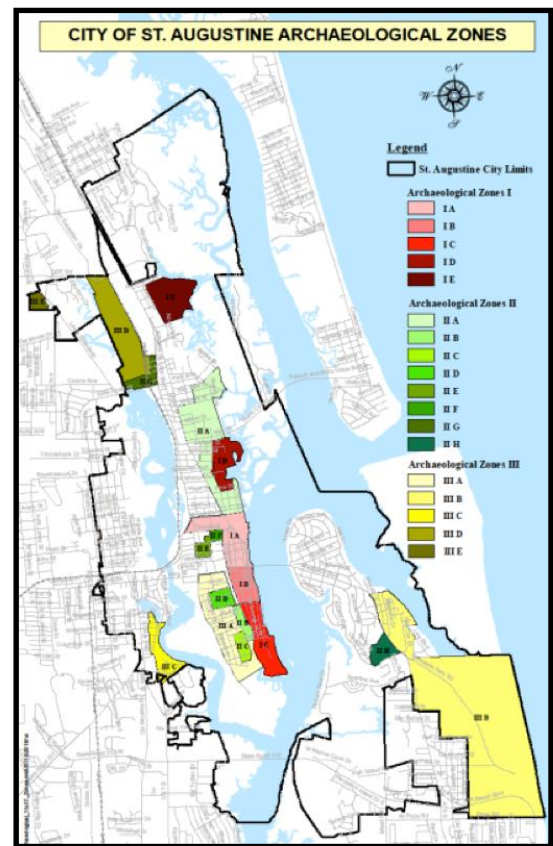
<sup>58</sup> City of St. Augustine, Archaeology in St. Augustine, Archaeology Ordinance (available at [http://www.citystaug.com/document\\_center/Archaeology/ArchaeologyOrdinance.pdf](http://www.citystaug.com/document_center/Archaeology/ArchaeologyOrdinance.pdf)).

<sup>59</sup> City of St. Augustine DRAFT Historic Preservation Master Plan, Historic Preservation Strategies at 5.4. (DRAFT August 2017); City of St. Augustine, Archaeological Zones, Zone 1, (available at <http://www.citystaug.com/archaeology/zone1.php>).

settlement.<sup>60</sup> The archaeological ordinance triggers an archaeological review on a site with any disturbance of just three inches of soil.<sup>61</sup> A disturbance includes the “cumulative digging, excavating, site preparation work or other such construction activities, regardless of the number of individual excavation or construction areas, related to an archaeological site.”<sup>62</sup> With our proposed adaptive design guidelines for improving the resiliency of qualifying structures, we anticipate that additional construction on vulnerable historic buildings will trigger more archaeological reviews of properties within our project site.

Concerns about the impacts of sea level rise inundating archeological sites is an issue the City of St. Augustine previously addressed in the workshopping component of the Adaptation Plan. The responsive strategies discussed by the workshopping addressed two types of decisions, (1) “which sites to excavate quickly,” and (2) “whether and how much to attempt the digital mapping and recording of information, including at sites that will not be fully excavated.”<sup>63</sup> The Historic Preservation Element of the Comprehensive Plan includes the objective to “continue to identify and preserve archaeological resources” and includes policies to enforce the City’s archaeological program.<sup>64</sup>

The City of St. Augustine’s draft Historic Preservation Master Plan includes numerous policy statements which support the City’s Archaeological Program.<sup>65</sup> Generally, the City already intends to expand and enhance support of the Archaeological Program.<sup>66</sup> As noted under the Historic Preservation Strategies under the draft Historic Preservation Master Plan, the Archaeology Program “is challenged by the need to respond to rising sea levels, which can make threatened deposits inaccessible, and an increase in new construction associated with demolition applications.”<sup>67</sup> If the City wants to take advantage of this window of opportunity to review these archeological deposits, the time to act is now. Adhering to the goals of expanding funding and support to the archaeology program will enable the City of St. Augustine to examine these sites before it is too late.



Source: City of St. Augustine, Archaeological Zones Map

<sup>60</sup> City of St. Augustine, Archaeological Zones, Zone 1, (available at <http://www.citystaug.com/archaeology/zone1.php>).

<sup>61</sup> City of St. Augustine, Archaeology in St. Augustine, Archaeology Ordinance (available at [http://www.citystaug.com/document\\_center/Archaeology/ArchaeologyOrdinance.pdf](http://www.citystaug.com/document_center/Archaeology/ArchaeologyOrdinance.pdf)).

<sup>62</sup> *Id.*

<sup>63</sup> Florida Community Resiliency Initiative Pilot Project, Adaptation Plan for St. Augustine, Florida. Adaptation Plan, Appendix C: Preliminary Workshop Summary, C-3 (May 2017).

<sup>64</sup> City of St. Augustine 2030 Comprehensive Plan, Evaluation and Appraisal Report-Based Amendments, Historic Preservation Element 102 (June 2011).

<sup>65</sup> See generally, City of St. Augustine DRAFT Historic Preservation Master Plan (DRAFT August 2017).

<sup>66</sup> *Id.* Historic Preservation Strategies at 5.4., 4.27.

<sup>67</sup> *Id.*

## CONCLUSIONS ABOUT LEGAL AND POLICY CONSIDERATIONS

Our project site is uniquely impacted by several legal and policy considerations in planning for the impacts of sea level rise. While our targeted response addresses our project site specifically, there are still other broad policy considerations worth researching, such as amending the comprehensive plan to incorporate adaptation action areas with supporting zoning overlays.<sup>68</sup> Additional concerns about potential municipal liability associated with adaptive changes, such as an updated water mitigation system failing, is another issue worth addressing in a more extensive analysis of adaptive change.<sup>69</sup> Lastly, additional research could address concerns with federal funds, such as post-hurricane FEMA funding, triggering Section 106 review under the National Historic Preservation Act for an undertaking without taking into account “the effect of the undertaking on any historic property.”<sup>70</sup>

In conclusion, there several legal and policy considerations specific to our site and design proposals, especially concerning the adaptation of historic buildings. Revising the City of St. Augustine's Comprehensive Plan to include more operative language to address the impacts of sea level rise will help the City oversee short-term and long-term adaptive solutions. Evaluating the basis for determining height restrictions in zoning will help the City address appropriate adaptive elevation strategies for historic buildings. Revising and expanding the ad valorem tax program will incentive the rehabilitation of historic buildings to improve their resiliency. Finally, increased adaptive changes in historic districts, like our project site, will trigger more archeological investigations throughout the city, which might be the last opportunity to examine these archeological resources before the long-term impacts of sea level rise inundate these areas.

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<sup>68</sup> (For more detailed information see generally Florida Community Resiliency Initiative Pilot Project, Adaptation Plan for St. Augustine, Florida. Adaptation Plan, 22 (May 2017); see also South Florida Regional Planning Council, Adaptation Action Areas: A Planning Guidebook for Florida's Local Governments Regional Climate Action Framework: Implementation Guide 50–62 (2015), available at <https://perma.cc/2H39-7WUC>.

<sup>69</sup> See Thomas Ruppert & Carly Grimm, *Drowning in Place: Local Government Costs and*

*Liabilities for Flooding Due to Sea-level Rise*, 87 Fla. Bar J. 29 (Nov. 2013), available at <https://perma.cc/6SUM-36Q9>. (discussing *Jordan v. St. Johns County*).

<sup>70</sup> See generally Section 106 Assistance for Users, available at <http://www.achp.gov/usersguide.html>; 54 U.S.C. § 306108, formerly 16 U.S.C. § 470f.

# COMMUNICATIONS STRATEGY FOR EDUCATION AND ENGAGEMENT



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 (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.

## \* 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.

## \* PARTICIPATION

Public participation in the city's decision-making process to mitigate the effects of flooding, improve 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.

After studying the three sites in St. Augustine and engaging with the public in those three sites, suggestions around awareness, preparedness and participation arose at each site.

At Avenida Menendez, many homeowners have already begun taking steps to prepare for future storms including the elevation of their traditional living space by a few feet and the creation of flood barriers to block out the water that rises over the city's sea wall. In an effort to preserve the integrity of the architecturally rich structures, the city's standards and expectations should be thoroughly communicated throughout the adaptation process.

Although this site was the focus of our collaborative partnership with the city of St. Augustine, there are other residential areas throughout the city as well as private business suffering from 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. Focusing on the sustainability and longevity of the historic city and its communities rather than the doomsday narrative often seen can promote public engagement from residents and business in not only the city’s efforts but in self-mitigation practices as well.



# AVENIDA MENENDEZ

ST. AUGUSTINE, FLORIDA

## CONCLUSION



# CONCLUSION

**Table 1. Identified time horizons and relevance to municipal planning and infrastructure.**

Life Cycle Alignment	Time Horizon/ Time Period	Relevance	Use
<b>Municipal Planning</b>	20-40 years	Comprehensive Plan & Outcomes	Vulnerability assessment Key planning value
	2035-2055	Short end of Commercial and Utility life-cycles	Basis for evaluation of all adaptation strategies
<b>Critical Infrastructure/ Long-term awareness</b>	50-80 years	Utility Infrastructure life-cycles Transportation infrastructure lifecycles	Secondary vulnerability assessment to provide insight into long-term risk Basis for long-term infrastructure decisions
	2065-2085	Residential structure lifecycles	Evaluate cost-effectiveness of additional protection for adaptable resilience strategies

The range of SLR projections was established from the NOAA SLR scenarios for the U.S. (NOAA 2012). Relative SLR projections from Mayport, FL based on the NOAA guidance were retrieved from the U.S. Army Corps of Engineers Sea-Level Change Curve Calculator (<http://www.corpsclimate.us/ccaceslcurves.cfm>, USACE 2016). The Mayport gauge location was selected as it was the closest to St. Augustine. Projected SLR values for the short- and long-term horizons are provided in Table 2.

engagement with residential decision-making and city regulation for adaptive design.

We saw that the planning process around adaptive design maneuvers will be essential to the continued care and success of the Avenida Menendez site. As discussed in the adaptation solutions and design opportunities, change will be required consistently, and collaboration is essential. The adaptation solutions that this paper has outlined are not meant to be temporary solutions but unending action which becomes a regular part of the city planning process. This has wide relevance, not limited to the Avenida Menendez. Our analysis of the site, interviews with residents, and research show that treatment of the Avenida Menendez site should be centered on creative solutions for preserving the built environment of the waterfront site. This report underlines, that using regulatory and administrative networks in new ways, along with private-public partnership, will be an answer for this site and act as an example for the rest of St. Augustine. This approach should be integrated into planning and will enhance the resiliency of the city and its region.

The Vulnerability Assessment completed for the City in 2016 puts Residential structure lifecycles in the critical infrastructure category, which we of this report agree with. The goal of this report however, was to emphasize that engaging residential role in critical infrastructure processes, such as adaptive design, is not a secondary or long-term action, but one that must be started immediately. Our report outlines important and relevant concerns and designs for this immediate



# AVENIDA MENENDEZ

ST. AUGUSTINE, FLORIDA

## TEAM QUALIFICATIONS

## DESIGN TEAM



### ROSEMARIE FUSCO

Rosemarie is a graduate student in Urban and Regional Planning at the University of Florida. Rosemarie holds a BA in Criticism and History of Architecture and Design and a BFA in Printmaking and Graphic Design from Pratt Institute, Brooklyn NY. Her professional background is in public works administration and spatial design for large institutions. Spending her life in coastal cities such as Tokyo, New York, and Seattle - Rosemarie has cultivated a passion for urban hydrology and coastal resiliency. Her research is focused on financing adaptation planning in city governments. She is currently an assistant in the GeoPlan Center at UF.



### MICHAEL BOYNTON

Michael is in his final year at the University of Florida Levin College of Law and is graduating with a Certificate in Environmental and Land Use Law. Along with his legal and urban planning experience, Michael has a Master's in Urban and Regional Planning from Rollins College and a Bachelor's in Political Science and History from the University of Florida. As a native Floridian, Michael cares about planning for the long-term impacts of climate change on Florida.



### MAYRELIS PEREZ

Mayrelis is a graduate student in Historic Preservation at the University of Florida. She has a Bachelor of Architecture degree with a Concentration in Historic Preservation. Mayrelis has worked in architectural offices focusing on adaptive reuse projects. Her recent work with the UF Envision Heritage team has introduced her to Sea Level Rise and sparked an interest on the subject since there is much room for future development and adaptation.



### LIANA ZAFRAN

Liana is a third year undergraduate pursuing a degree in Sustainability Studies. Throughout her time in St. Augustine, she shot and directed 2 mini-films that serve to document the coastal area's challenges with sea level rise and the historic narratives, beginning with the Timucuan creation story, that make the region unique. Overall, Liana values bio-centric solutions that reinforce the interdependent relationship which underlies all interactions on Earth.

Rosemarie Fusco, [rosemariefusco@gmail.com](mailto:rosemariefusco@gmail.com), 845-269-2609

## Education

2017-2019 Current Candidate - University of Florida, Gainesville FL; Master of Urban & Regional Planning  
2003-2007 Pratt Institute, Brooklyn NY; B.A., Theory, Criticism, & History of Architecture & Design  
2003-2007 Pratt Institute, Brooklyn NY; B.F.A., Printmaking & Graphic Design  
2006 Scuola Internazionale della Grafica, Venice, IT; Certificate of Historic Graphics

## Employment

*University of Florida, 1480 Inner Rd, Gainesville, FL*

August 2017 - Current

(1) *Department Assistant, School of Landscape Architecture and Planning*

- Supporting administration, acting as Teaching Assistant, and updating website/online materials.

(2) *Assistant at GeoPlan Center*

- Providing support for regional training sessions on the Sea Level Rise Tool (an ArcGIS Python app).

- Updating mapping layers using ArcGIS and ArcCatalog, within the Florida Geographic Data Library.

*Assistant – M.I. Historical Society, Collier County Museum, 180 S Heathwood, Marco Island, FL*

January 2015 – July 2017

- Completed large database overhaul, organized public online access using museum website.

- Worked on development and planning projects, to promote growth of organization and publicity.

- Attended Collier County Historic Preservation & Archaeology Planning Board Meetings.

*Executive Assistant & Office Manager – Deep Blue Communications, 7 Century Hill Dr., Latham NY*

September 2013 – December 2014

- Managed scheduling, control documents, customer database, and all support to CEO and COO.

- Arranged all details for corporate events, hosting, conference travel, and board meetings.

- Managed all supply stocks, vendor relationships, and provided solutions for technical repair teams.

*Registrar & Controller - Mike Weiss Gallery, 520 West 24th St., New York, NY*

December 2011 – January 2013

- Maintained all master documentation; bookkeeping reports, sales log, website, and installation.

- Managed studios for 14 represented artists, including many public works.

*Production Coordinator - David Zwirner Inc., 525 West 19th St., New York, NY*

October 2008 – June 2011

- Reported to Director of Inventory and Facilities; managed inventory database and documentation.

- Managed installation workflow for large spaces and domestic shipping for public and private installations.

## Project-Based Consulting

January 2013 – July 2013 *Lead, Special Events, Burke Museum of Natural History, University of Washington, Seattle, WA*

July 2011 – January 2012 *Temporary Special Events, Lincoln Center for the Performing Arts, Inc., New York, NY*

May 2006 – May 2007 *Lab Tech, Conservation Lab, Brooklyn Museum of Art, Brooklyn NY*

## Training

Professional work in GIS mapping, historic preservation, database content, graphic design, production design of cultural affairs, facilities maintenance, special event planning, & team management. Trained in, but not limited to:

- Client Relations Management Software
- Property Management Software
- Microsoft Office Programming
- ESRI ArcGIS Platform including Story Maps
- Full Adobe Creative Suite and SketchUp
- Wordpress, Sharepoint, Quickbooks

## Extra

- 65 WPM typing speed
- Languages: Italian, French, Spanish
- Volunteer, Florida State Parks Service
- Volunteer, Gainesville Modern
- Candidate, American Institute Certified Planners
- Secretary, Student Planning Association, UF
- Active Member, Florida Trust Historic Preservation
- Active Member, Florida Association of Museums

# MICHAEL GARY BOYNTON

MGBoynton@gmail.com ♦ 1671 Legion Drive, Winter Park, FL 32789 ♦ (407) 808-1868

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## EDUCATION

### **University of Florida Levin College of Law, Gainesville, FL**

*Juris Doctor Candidate*

May 2018

GPA 3.47 (Top 22% of class)

*Journal of Law & Public Policy*, Executive Outreach Chair; Book Awards in Insurance Law; Interviewing, Counseling, & Negotiation; International & Comparative Law Skills

Certificate in Environmental and Land Use Law

Dean's List Designation; Member of Phi Delta Phi Legal Honor Society

Recipient of Lewis "Lukie" Ansbacher Endowed Memorial Merit-Based Scholarship

### **Florida A&M University College of Law, Evening Program, Orlando, FL**

*Juris Doctor Coursework*

Attended August 2014 - May 2016

GPA 3.43 (Ranked first in class)

Book Awards in Torts; Criminal Law; Legal Methods I; Legal Methods II

Recipient of Dean's Scholarship; Dean's List Designation; Law Review Grade-on

### **Rollins College, Winter Park, FL**

*Master of Planning in Civic Urbanism (Urban and Regional Planning)*,

May 2013

GPA 3.69

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

*Bachelor of Arts, Political Science and History, Cum Laude*

May 2008

## EXPERIENCE

### **Colling Gilbert Wright & Carter, Orlando, FL**

*Legal Intern*

September 2015 - July 2016

Drafted motions, responses, memorandums of law, and other pleadings on active files concerning personal injury, medical malpractice, slip and fall, and nursing home abuse. Assisted partners and associates at the firm in preparing for mediations and trials. Reviewed and prepared documents for discovery.

### **Morgan, White-Davis & Martinez, P.A., Winter Park, FL**

*Legal Assistant*

May 2010 - September 2015

Filed applications and appeals for Title II and Title XVI Social Security Claimants. Regularly communicated with Claimants and updated changes in their medical conditions. Drafted Medical Source Statements and memorandums. Managed Social Security, Workers' Compensation and Personal Injury intakes for the law firm. Trained additional employees.

### **State Attorney's Office of the Ninth Judicial Circuit, Orlando, FL**

*Legal Intern*

May 2008 - July 2008

Assisted the Felony-Bureau Chief at trials, reviewed documents, compiled exhibits, reviewed prison tapes, and organized witnesses during trials.

# MAYRELIS PEREZ

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2220 SW 34th St. Apt. 316, Gainesville, FL 32608

C: (818) 390-0035 mayrepjc@gmail.com

## EDUCATION

2009-2011 | Academy of the Canyons | High School Diploma | Valencia, CA  
2011-2016 | California State Polytechnic University | College of Environmental Design |  
*Bachelor's of Architecture Degree | Pomona, CA*  
2017-Summer | Preservation Institute Nantucket | University of Florida Historic Preservation Program |  
*NCPTT Photogrammetry and Laser Scanning Training | Nantucket, MA*  
2017-Current | University of Florida | College of Design, Construction & Planning |  
*Master of Historic Preservation | Gainesville, FL*

## EMPLOYMENT

2014-2016 | ENV Archives-Special Collections | Assistant | Pomona, CA  
*Record Keeping, Collection Organization, Database Drafter/Writer | Multiple Collections*  
2015-2016 | Page & Turnbull | Architectural Intern | Los Angeles, CA  
*2D Drafting, 3D Modeling, Rendering and Specifications, Historic Preservation & Architectural Designer | Multiple Projects*  
2016-2017 | IS Architecture | Junior Job Captain | La Jolla, CA  
*2D Drafting, 3D Modeling, Rendering, Construction Documents and Specifications, Consultant Communication, Historic Preservation Consultant, Architectural Designer | Multiple Projects*  
2017- Current | Envision Heritage | Drafter | Gainesville, FL  
*2D Drafting, 3D Modeling, Rendering, Construction Documents and Specifications, Laser Scanning & Photogrammetry Documentation, HABS Documentation | Multiple Projects*

## AWARDS

2012 | Golden State Seal Merit  
2013 | Disney Imagineering Traveling Award  
2014 | INTERIM Exhibition | Cal Poly Pomona | Department of Architecture  
2015 & 2016 | Knox Mellon Award in Historic Preservation  
2018 | Villagers' Preservation Scholarship Recipient

## INVOLVEMENT

2014 | Architectural Design Assistant | Supervising Professor: Irma Ramirez  
2014 | Team Member | North China University of Technology | Beijing, China | Summer Design Quarter  
2015 | Architectural Teaching Assistant | Supervising Professor: Lauren Bricker  
2015-2016 | Sigma Alpha Pi | Leadership Honors Society | Pomona Chapter  
2016 | Docent | Neutra VLD House | Silverlake, CA  
2017-Current | Florida Flagship Modern Buildings Survey | University of Florida  
2017-Current | Gainesville Mid-Century Survey | City of Gainesville, Department of Doing



Liana Zafran

#### CONTACT

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#### PERSONALITY TRAITS

Compassionate  
Observant  
Passionate  
Cerebral  
Imaginative  
Curious  
Optimistic  
Competant  
Warm  
Creative

#### PASSIONS

Protecting and Nourishing the Land  
Organic and Sustainable Farming  
Artistic Expression  
Cooking with Wild Foods  
Simple Living

#### EDUCATION

University of Florida, Gainesville, FL

Sustainability Major / Natural Resource and Agricultural Ethics and Policy Minor

EXPECTED GRADUATION DATE: SPRING 2019

#### INTERNSHIPS

Florida Organic Growers

AUGUST 2016 - OCTOBER 2017

Coordinate programming for FOG's Organic Food and Farming Summit, Develop an interdisciplinary agenda with emphasis on sustainable social, economic and environmental practices within the food system, Organize the event's farm tour series, Provide summit attendees with hands-on, interactive workshops through on-farm grafting and implements workshops.

#### EXPERIENCE

Siembra Farms - Farm Volunteer

MARCH 2016 - PRESENT

Care for crops utilizing organic farming practices, Understand symptoms and solutions such as managing pests and attracting beneficials and Implement organic controls that are balanced in their convenience and environmental impact.

The Fine Print - Staff Writer

MARCH 2016 - PRESENT

Prioritize marginalized voices through hyper-local advocacy journalism, Maintain loyalty of local citizens through transparency, Investigate deeply divisive systems with critical attention to deeply engrained complexities and Communicate systemic patterns.

Camp Harlam - Lead Cabin Counselor

MAY 2015 - AUGUST 2016

Identified and respond to camper behavior with compassion, advocated for my campers' needs in a sleepaway camp setting, Built personal relationships based on trust with campers, Communicated with supervisors and parents to assure all needs were being met, Lead hikes and nature excursions, and Was recognized by my supervisors with an award of excellence.

#### ACKNOWLEDGMENTS

Southern Association of Student Councils - Leadership Outreach and Mentorship Award 2013, 2014, 2015

Received 1st place award three consecutive years for my project called The Buddy System.

In this program, members of student government and students with disabilities were paired as buddies based on compatible personality traits. Weekly activities such as picnics, plays and pottery brought the buddies together for laughs and smiles. Based on the ideals of inclusion, this program fostered long-lasting relationships and still exists today.

#### CERTIFICATIONS

National Council for Behavioral Health - Mental Health First Aid Certified

MAY 2015 - PRESENT

Applied training in daily interactions with campers who had disabilities and special needs, and Prompted me to focus on inclusion and compassion when working with different types of people.

## APPENDIX B — Acknowledgements

First and foremost, our student group would like to extend gratitude and thanks to the great City of St. Augustine. The residents and members of the city made our experience working and exploring so fruitful. Thank you to Mayor Nancy Shaver for welcoming us and to listening to our thoughts.

The City Staff was generous with their time and knowledge, and this was so greatly appreciated. Specifically, Jessica Beach and Jenny Wolfe; we are indebted to you and thank you for your guidance and for answering 1 million questions a day.

Thank you to all our lecturers during this semester who widened our horizons and provided us with much needed perspective: Kathryn Frank and Mike Volk from the College of Design, Construction, & Planning, Eban Bean from the College of Engineering, Andrea Dutton from the Department of Geological Sciences, Thomas Hawkins, from UF Law and 1000 Friends of Florida, Misty Sharp from the Department of Food and Resource Economics, and Dan Fesenmeier from the UF Department of Tourism.

This report and all the brilliant learning achieved this semester was made possible by our role models and professors, who brought us through this semester and provided us with the strength and motivation to achieve and to seek answers. Thank you so much to our core: Alyson Fournoy and Tim McLendon, College of Law, Arnaldo Valle-Levinson, College of Engineering, Alyson Larson, College of Journalism, and Marty Hylton and Crystal Goodison, College of Design, Construction, & Planning.

And to our fearless leader and lead goose, Carolyn Cox – you have essentially achieved the impossible. How you got us all here, we will never really know. Thank you for your incredible hard work and patience. Your organization this semester has made such an impact on all of us and it will be remembered.



## APPENDIX C — References/Sources

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2. City of Key West, Florida, Code of Ordinances, Art. V. Supplementary District Regulations, Division 3 Area Requirements. Ord. No. 15-07, § 1, 4-7-2015. Sec. 122-1149(d). - Height. (available at
3. City of St. Augustine, Archaeological Zones, Map of City of St. Augustine Archaeological Zones, available at <http://www.citystaug.com/archaeology/zones.php>.
4. City of St. Augustine 2030 Comprehensive Plan, Evaluation and Appraisal Report-Based Amendments (June 2011).
5. City of St. Augustine Code of Ordinances, Chapter 28, Article 1- In General, Sec. 28-2. – Definitions (available at [https://library.municode.com/fl/st.\\_augustine/codes/code\\_of\\_ordinances?nodeId=PTIIC OOR\\_CH28ZO\\_ARTIINGE\\_S28-2DE](https://library.municode.com/fl/st._augustine/codes/code_of_ordinances?nodeId=PTIIC OOR_CH28ZO_ARTIINGE_S28-2DE)).
6. City of St. Augustine, Map of Historic Preservation Zones of St. Augustine, available at [http://cms4.revize.com/revize/staugustinefl/document\\_center/PlanningBuilding/Maps/HistoricPreservationZones.pdf](http://cms4.revize.com/revize/staugustinefl/document_center/PlanningBuilding/Maps/HistoricPreservationZones.pdf)).
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14. Federal Emergency Management Agency, Coastal Hazard Mapping Questions, available at <https://perma.cc/HYN7-XMY5> (last updated Aug. 17, 2016).
15. Flood Control America. How the Flood Wall Works.
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17. Implementation Guide 50–62 (2015), available at <https://perma.cc/2H39-7WUC>.
18. Louisiana Office of Cultural Development. Elevation Design Guidelines for Historic Buildings in the Louisiana GO Zone.
19. Marin Ocean Coast Sea Level Rise Adaptation Report.
20. National Center for Preservation Technology and Training. Building Elevation Definition.
21. Section 106 Assistance for Users, available at <http://www.achp.gov/usersguide.html>.
22. South Florida Regional Planning Council, Adaptation Action Areas: A Planning Guidebook for Florida's Local Governments Regional Climate Action Framework:
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27. St. Augustine Seawall. City of St. Augustine, St. Johns County, Florida. July, 2011.
28. 54 U.S.C. § 306108, formerly 16 U.S.C. § 470f.