

ULI TECHNICAL ASSISTANCE PANEL

CITY OF ST. PETERSBURG

ZONING STANDARDS FOR MULTI-FAMILY DEVELOPMENT IN THE COASTAL HIGH HAZARD AREA

June 18 + June 19, 2019

INTRODUCTION

About ULI

The Urban Land Institute (ULI) is a not-for-profit education and research institute supported by its members. Its mission is to provide leadership in the responsible use of land and in creating and sustaining thriving communities worldwide. Established in 1936, ULI has more than 45,000 members internationally representing all aspects of land use and development disciplines. The Tampa Bay District Council has more than 600 members in 7 counties including Pinellas, Hillsborough, Pasco, Manatee, Sarasota, Hernandez and Citrus.

About ULI Technical Assistance Panels (TAPs)

In keeping with the Urban Land Institute mission, Technical Assistance Panels (TAPs) are convened to provide planning and development assistance to public officials and local stakeholders of communities, nonprofit organizations and private sector representatives who have requested assistance in addressing their land use challenges. A group of diverse professionals representing the full spectrum of land use and real estate disciplines typically spend two days visiting and analyzing the built environments, identifying specific planning and development issues, and formulating realistic and actionable recommendations to move initiatives forward. Panel members are not compensated for their time, but they are reimbursed for out-of-pocket expenses, such as overnight lodging and transportation to attend the TAP.

ULI TEAM

ULI Tampa Bay assembled a diverse mix of regional and national ULI member leaders:

- Jim Cloar, Downtown Development Strategies (TAP Chair)
- Chris Ahern, Applied Technology & Management
- Michael Antinelli, Brizaga, Inc
- Leigh Fletcher, Fletcher & Fischer
- Nick Herring, Framework Group
- Manuela Powidayko, City of New York
- Whit Remer, Insurance Institute for Business & Home Safety
- Kristine Retetagos, KAST Construction
- Taryn Sabia, Florida Center for Community Design and Research, USF
- Jeremy Sharp, City of Norfolk
- Siobhan O’Kane, ULI Tampa Bay
- Jenna Wylie, ULI Tampa Bay
- Maggie Winter, Florida Center for Community Design and Research, USF

PARTNER

- City of St. Petersburg

SPONSOR

- Kresge Foundation
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BACKGROUND

ULI Tampa Bay provided technical assistance to the City of St. Petersburg on zoning standards for the City of St. Petersburg's Comprehensive Plan and Land Development Regulations in the Coastal High Hazard Area (CHHA).

The 2016 CHHA area within the city has more than doubled in size due to an update to the computer model that determines vulnerable area. Developed by the National Weather Service, the SLOSH model estimates storm surge heights resulting from historical, hypothetical, or predicted hurricanes by taking into account the atmospheric pressure, size, forward speed, and track data. These parameters are used to create a model of the wind field which drives the storm surge. The CHHA now covers a total of 16,328 acres or 41% of the City of St. Petersburg, an increase from 7,705 acres identified in the 2010 map. See page 45.

Locations now within the CHHA include some high-profile areas identified as important for economic development, including the Innovation District, the USF St. Petersburg Campus, Metropointe Commerce Park, Carillon Office Park, Jabil Headquarters Campus, and the Skyway Marina District.

Areas included in the CHHA are governed both by state law and the policies adopted to administer those provisions in local government comprehensive plans. To reduce loss of life and property caused by natural disasters, the State of Florida requires local governments to identify the CHHA and plan accordingly with the emphasis on reducing vulnerability to hurricane impacts.

The city wants to increase resiliency and reduce flood risk within the CHHA by establishing elevated design standards in the land development code for multifamily residential development in the CHHA in order to create projects that are more resilient to storm surge, mitigate for service and infrastructure needs during and immediately following a major storm event, enable safe re-occupation as quickly as possible following an evacuation, and increase the likelihood that there is something to come back to.

The city is considering elevating design standards for multi-family development through the introduction of a point system within the City's Land Development Code (LDR) that would enable developers the opportunity to choose from a menu of 'resilience measures' that promote flood risk reduction, stormwater management, and energy resilience, among other practices.

This point system would apply to any new multi-family development in the CHHA. The city is interested in the City of Norfolk, Virginia's recent adoption of a similar code.

Given that the CHHA is now 41% of the city, the city is being thoughtful about balancing goals and objectives for addressing resiliency, emergency management, economic development, workforce housing, community and growth management. As such, the city is also reviewing code and comprehensive plan amendments pertaining to requests for an increase in density in the CHHA. Under current policy, requests for increased density are not allowed in the CHHA, per Land Use Policy LU7.1. In other words, any requests to amend current zoning to allow for a greater number of units is currently not permitted.

Under the City's current proposed LDR and Comprehensive Plan amendments, meeting the thresholds of the proposed 'resilient point system' would allow a developer to apply for additional density. In addition to satisfying the points requirement, these applications would also have to be evaluated against balancing criteria that would be added to the City's Comprehensive Plan.

These balancing criteria, outlined below in brief, are already found in the Countywide Plan Rules, administered by Forward Pinellas, but would be adopted at the local level. The City of St. Petersburg proposes to add an additional three, shown in items 10 through 12.

1. *Access to Emergency Shelter Space and Evacuation Routes.*
2. *Utilization of Existing and Planned Infrastructure.*
3. *Utilization of Existing Disturbed Areas.*
4. *Maintenance of Scenic Qualities and Improvement of Public Access to Water.*
5. *Water Dependent Use.*
6. *Part of Community Redevelopment Plan.*
7. *Overall Reduction of Density or Intensity.*
8. *Clustering of Uses.*
9. *Integral Part of Comprehensive Planning Process.*
- 10. *Location within an Activity Center or Target Employment Center.***
- 11. *Furthers the Goals and Policies of the Integrated Sustainability Action Plan (ISAP).***
- 12. *Reduction of Storm Vulnerable Structures.***

Furthermore, for project proposals that would increase density in the CHHA, the city proposes to require multifamily developers to fiscally mitigate the increased demand for emergency shelter capacity that the project would trigger by increasing the population density of the CHHA. Developers would be required to pay a "to be determined" Shelter Mitigation Fee proportional to the county's cost burden for providing additional shelter space.

It should be noted that any requests for increases in density via an amendment to the City's Future Land Use Map and/or Official Zoning Map, whether they are City-initiated or private applications, would still be subject to the City's normal application process, including public notice, CPPC and City Council public hearings, and state, regional and county review. All applications are reviewed and considered on a case-by-case basis.

TAP SCOPE

1. **Evaluate the draft zoning standard and comprehensive plan amendment and:**
 - a. Identify additional “requirements” that multifamily residential projects must include when constructing within the CHHA, regardless of an increase in density. *(For example, the City of Norfolk components/categories are Risk Reduction, Stormwater Management, Energy Resilience. Create some categories that are more St. Petersburg-centric.)*
 - b. Estimate the costs of the additional requirements.
 - c. Assign a “weight” to each requirement and devise a “minimum number of points needed” scorecard (for each component/category).

2. **Provide other recommendations pertaining to the draft CHHA standard and introducing increased density in the CHHA.**

TAP PROCESS

ULI Tampa Bay assembled a team of ULI members who have expertise in resilient construction standards, multi-family development, pre-construction & estimating, planning, engineering, economic development, and land-use law for an intensive two-day workshop. Prior to convening, the ULI team received background information specific to the CHHA and relevant economic development and planning documents. ULI had preliminary meetings with the city team to prepare for the panel and better define the scope of work for the two-day TAP.

Day one of the TAP included a tour of the key locations within the recently expanded CHHA as well as a series of stakeholder interviews. Stakeholders included city staff, business and community leaders, developers, insurance experts and more.

Day two focused on potential strategies and solutions to the issues. Panelists formalized their observations and developed recommendations. At the day’s end, the ULI team made an initial public presentation to the team at the city and members of the business and residential community.

Perceptions & Potential

Every ULI Technical Assistance Panel begins with and relies on outreach to get a substantive insider perspective on the subject at hand.

A series of stakeholder meetings were held in order for the ULI team to assess concerns, questions, and ideas regarding proposed changes to the City's land development code and comprehensive plan. Stakeholder groups included members of the development community: practitioners from planning, engineering and architecture, developers, utility companies, insurance, and the Tampa Bay Regional Resiliency Coalition. ULI held additional meetings with city staff, including from emergency management. The following opportunities and constraints emerged from the stakeholder discussions.

What We Heard

Opportunities

- Buildings constructed to a higher standard within the CHHA makes the CHHA more resilient and sets an important example for the wider City.
- Attention to this topic represents an opportunity to focus on preparedness education and outreach.
 - When requiring developers to create “Hurricane Evacuation and Re-Entry Plans” (per Development Regulation G in the draft proposal) be mindful that this is outside of their wheelhouse. The city should work with emergency management to provide examples of best practice and a simple template to provide clarity, make the process easier on developers, and ensure that the plan is appropriate, effective and aligned with the emergency management procedures and goals.
- Opportunity to increase the likelihood that residents have something to return to in the case of a storm.
- Establishing a fund to make capital improvements or providing financial resources to emergency management is a smart solution to achieve the envisioned emergency response plans for the City.
- From an emergency management perspective, there may be value in increasing the number of resilient dwellings that would be under mandatory evacuation. New developments that are designed to both be livable after a hurricane event and be self-sustaining after residents are allowed to return to their homes may reduce the overall dependence on emergency management services.
- New development in the CHHA can mitigate risk by replacing older, more vulnerable structures with a much more resilient building stock. The high standards of current Florida building code ensure that any new building would be inherently more resilient than those built before 2010.
- In general, many of the large institutions in the CHHA, like the hospitals, have a strong need for more workforce housing close to their campuses.
- During emergency situations and storm events, critical facilities such as hospitals provide their own shelter for workers and their families in order to have critical staff

- teams nearby and ready to respond. This is made easier if the staff already live nearby, because the ability to make a longer commute to the hospital during a storm event can become very difficult.
- There is the potential to apply this new code to commercial buildings and other uses in the CHHA for a more complete picture of a resilient St. Petersburg.
 - Future opportunity to apply this standard city-wide with potential higher standard for the CHHA.
 - There is an opportunity to encourage and incentivize the upgrade of existing buildings/redevelopment to be more resilient.
 - Living shorelines can be community assets. Refer to Army Corps Nationwide Permit 54 for erosion-prevention projects.
 - Consideration for other potential development off-sets, other than increased density. For example, a TDR/density swap within the CHHA with a preservation component that would lead to no net change in the overall density of the CHHA.
 - Potential for encouraging new linkages or communal investment in shared systems which relate to multi-family development and future infrastructure.
 - The proposed code can unlock opportunities for economic development in the burgeoning Innovation District, etc. because it will provide a pathway to thoughtfully increase density, which is currently not allowed under existing code.
 - The ROI for mitigation is strong. A recent analysis of 23 years of federally funded natural hazard mitigation investment suggests that society will ultimately save \$6 for every \$1 spent on up-front mitigation cost.

Constraints

- There is the possibility of disinvestment in the CHHA because of an increase of cost of development.
- Less development in the high-profile areas of the CHHA could slow city economic development efforts. It could also depress real estate driven tax revenue, a critical funding source for the City's future resilient infrastructure investments.
- The proposed new balancing criteria is limiting and doesn't allow for consideration of applications outside targeted areas.
- The proposed draft code doesn't provide for a great enough range of options or flexibility and can therefore be limiting or render development infeasible.
- There is discontent on behalf of some developers of current projects within the new CHHA boundaries that have already been entitled and planned, but not yet issued permits. They feel they didn't have a chance to accommodate for the proposed point system during due diligence, and that it could unfairly affect the feasibility of projects that are already well into the planning process.
- Mitigation and adaptation techniques and threat measurement technologies are ever evolving. There is concern that the new code and point system may be too rigid to appropriately respond to and give recognition for ongoing innovations in technology and resilience problem solving.
- The proposed point system is building-specific but doesn't necessarily apply easily to a master planned, mixed-use or community scale proposals. Many of these large-

- scale developments have resilient systems built in at the community level, not necessarily within individual buildings. At present, the proposed point system doesn't have a way to recognize and allocate points for these types of investments of merit.
- There seems to be a lack of a detailed understanding of the vulnerable populations within the CHHA, which would help to inform a more holistic strategy for this area.
 - There is a lack of understanding of how this draft code relates to other city initiatives (Complete Streets, ISAP, Vision 2050).
 - Concern that increased density will place more people in harm's way and that there will be an impact of adding additional density on existing shelter deficits.
 - A missed opportunity to instead focus/encourage development in less vulnerable areas and utilize coastal land for preservation/mitigation.
 - Concern that this elevated standard will exacerbate housing affordability issues.
 - Suggestion that the city should provide more "carrots" than sticks to incent resilient building practices. For example, the city could consider a reduction in impact fees as a reward for following the points system.
 - Concern that designing the points thresholds based on ranges of the number of dwelling units in a project (per section B 16.30.040.4. -- *CHHA Design Standards* in the draft proposal) could lead to unintended consequences. Some stakeholders suggested devising a points threshold calculated on a "per unit basis".

Panel Recommendations

The City of St. Petersburg is working to reconcile risk reduction with future development. Integral to the city's policy decision making is the consideration of and reference to the city's goals, such as community development and safety, the Integrated Sustainability Action Plan (ISAP), workforce housing goals and its 'Health in all Policies' strategy. It is important that city leaders consider how this regulation can be applicable to a balanced, community-wide investment strategy. The city asked the ULI team to weigh in on a specific component of this.

The ULI team evaluated the draft zoning code for an elevated standard for multi-family development in the CHHA, prepared by staff at the City of St. Petersburg. This would introduce a resilience point system for all new multi-family development in the CHHA.

The City of Norfolk has served as a model for the City of St. Petersburg as it explores this resilience point system. The ULI team's recommendations were in part informed by the City of Norfolk's experiences and lessons-learned. These may also be instructive for the City of St. Petersburg as it moves forward.

- Include a range of options and alternatives for development, aligned with resilience goals.
- Be open and adaptive to change as the zoning code is implemented. Continually evaluate and amend, as required.
- Clearly connect the zoning code to a comprehensive strategy and goals for city-wide resiliency.
- Begin and maintain a dialogue with the local development community. Their feedback will be vital in fine-tuning the requirements.
- Track how the code is being implemented on a site-by-site basis. The innovative implementations that developers come up with can provide valuable case studies for future users.
- Be prepared to go "off book". Each site is unique, and the code can't possibly consider every possibility. In these unique circumstances, be prepared to adjust requirements.

More information on the City of Norfolk and the City of New York's experiences can be found beginning on page 36.

Expanded Point System Components

The city's proposed point system would require new development of multi-family structures to incorporate resilience measures from two components/categories— 'Risk Reduction' and 'Recovery'. The intent is to ensure that developments are more resilient to storm surge and enable safe re-occupation following an evacuation or weather event.

The ULI team determined that a system with additional components would better suit the multi-faceted approaches of addressing resiliency and represent a more holistic approach to building resilience and recovering quickly after storm events. These are:

- **Structural Mitigation:** Measures address physical construction, engineering techniques or technology that work to achieve hazard resistance and resilience in structures or systems to reduce or avoid possible impacts of hazards.
- **Energy:** Measures address the ability for buildings to be resource efficient, reduce waste and sustain electricity independently from the grid. They also facilitate the ability for buildings to stay online during weather events. Measures in this category align well with the city's climate and energy goals and further the objectives of the recently adopted Integrated Sustainability Action Plan.
- **Nature-Based Mitigation:** Nature-based measures use natural systems to provide critical services, such as wetlands for flood mitigation or mangroves to reduce the impact of waves, storm surge, and coastal erosion. These can be a cost-effective and flexible approach for disaster risk and water resource management.
- **Recovery:** This component focuses on measures implemented for post-disaster recovery, ensuring that places within the CHHA are intact and habitable after required evacuation events and that buildings are occupiable after residents are allowed to return. This component facilitates the resumption of services within a city.

Additional Pathways to Development

The proposed code amendment currently provides one pathway to development of new multi-family dwelling units in the CHHA. Through the proposed 'point system', developments must achieve a certain threshold of points, determined through the integration of measures outlined in the table.

The ULI team recommends providing additional pathways to development. Importantly, these pathways would still result in resilient building in the CHHA, but would allow more choice and flexibility, as well as help to address other city goals. This recommendation is, in part, informed by the experience of the City of Norfolk, which introduced the point system or 'Resilient Quotient' into their code in early 2018. See more on Page 36.

There are certain standards that would be a prerequisite to all development, unless identified as infeasible. These include:

- **Elevation Requirements:** All new or substantially improved multi-family units would need to comply with current city elevation requirements that the lowest habitable floor and all mechanical, electrical and plumbing (MEP) systems shall be at a minimum of base flood elevation (BFE) + 2 feet of freeboard. The ULI team recommends incorporating this requirement into this code to reinforce this standard.
- **Measures to Address Recovery:** Regardless of the chosen pathway to development, new development would need to incorporate measures that address recovery, as detailed

in the recovery points component. Measures in this category specifically address impacts of weather events on residents and buildings.

The ULI team's recommended pathways for the development of new multi-family dwelling units in the CHHA include:

1. Point System

This development pathway enables new developments to utilize the point system, which provides a menu of options for building resilience. A minimum number of points would be required based on the number of dwelling units. Applications for development would need to include points from all four components – structural mitigation, energy, nature-based solutions mitigation and recovery.

2. Leadership in Energy and Environmental Design (LEED) GOLD standard (or higher) or similar certification, plus a minimal number of points from the Recovery component.

Under this pathway, development of new multi-family standards that achieves a LEED Gold certification or higher would be permitted. LEED, which is a globally recognized symbol of sustainability achievement, provides a framework to create healthy, highly efficient and cost-saving green buildings.

Other similar certifications could also be considered, at the discretion of the zoning administrator.

A proposed development that meets LEED Gold standard or higher would also need to include a certain number of points under the recovery category on the point system to ensure buildings specifically mitigate for coastal storm events.

3. Workforce housing, plus a minimal number of points from the Recovery component.

During stakeholder interviews, the ULI team heard about the need for more affordable housing options throughout the city. With its doubling of size, the CHHA now includes more locations within employment and activity centers that could benefit from more affordable residential options.

Under this pathway, a proposal for the development of workforce housing that meets elevation requirements could be considered within the CHHA. Any new development

would still need to include a certain number of points under the recovery category on the point system to ensure buildings specifically mitigate for coastal storm events.

Workforce housing, or sometimes referred to as “missing middle housing” is defined by the City’s Comprehensive Plan.

Buildings that meet the City’s elevation requirements, comply with the required building code and introduce more ‘recovery’ components would be more resilient. This alternative pathway seeks to balance the financial feasibility of constructing affordable units, which can be more difficult than units considered market rate or luxury, with ensuring more resilient building.

4. Historic Preservation, plus a minimal number of points from the Recovery component.

This pathway would provide an exemption for designated historic structures. This would apply for any multi-family, deemed historic based on local, state and/or historic designation that is subject to substantial renovation. This is due to the cost that can often be associated with retrofitting an existing building, including complying with an elevation requirement. Any proposal for exemption on these grounds would need to also achieve a certain number of points under the recovery category.

Determining Points for the Point System

The ULI team conducted an exercise to evaluate costs and benefits of resiliency standards on a scale of low, middle, and high. The ULI team ranked each development activity by “cost of construction” and “value to resilience”. Both factors are important to consider and should inform the specific points allotted for each development activity/criterion. The rating system created by the ULI team has laid the foundation for creating the points system.

Items to consider when scoring points:

- The value of the resilience measure should reinforce the city’s goals and objectives for resiliency, as identified in the ISAP. To the extent possible, it should also be scored according to the specific vulnerabilities in the CHHA, such as flooding.
- Including a range of options from low to the high cost is preferable to provide flexibility and scalability to the development without compromising on its resiliency. The ULI team has additional suggested measures, identified in Table 2 on Page 26.
- The ULI team recommends that if a development uses the ‘point system’ that it should be required to earn at least one point from each of the four components, but earned points do not need to be distributed equally amongst the 4 components to reach the overall points threshold.

- As the point system is implemented, it is important to continually evaluate and amend. This is a new and unique system in the code and will require some 'real time' testing to make work.

These rankings shown in Table 3 on Page 29.

Recommended edits to the body copy of the *DRAFT CHHA LDR Code Amendment* by the ULI Team are illustrated in red below.

City of St. Petersburg DRAFT CHHA LDR Code Amendment

SECTION 16.30.040. - DEVELOPMENT IN THE COASTAL HIGH HAZARD AREA (CHHA) ~~AND THE HURRICANE VULNERABILITY ZONE OVERLAY~~¹⁹¹

16.30.040.1. - Development regulations.

- A. The Coastal High Hazard Area (CHHA) is the area at or below the elevation of the Category 1 storm surge line as established by the sea, lake and overland surges from hurricanes (SLOSH) computerized storm surge model. The CHHA ~~and the hurricane vulnerability zone are~~ is generally shown on the map in the coastal management element of the Comprehensive Plan. Development within these areas shall be consistent with the goals, objectives and policies of the Comprehensive Plan.
- B. New construction of hospitals, nursing homes and assisted living facilities is prohibited in ~~Hurricane Evacuation Level A Zones~~ the CHHA. ~~The construction or expansion of these uses in Hurricane Evacuation Level B Zones is discouraged.~~
- C. New mobile home parks are prohibited in ~~Evacuation Level A Zone~~ the CHHA.
- D. Solid waste and commercial hazardous waste management facilities including regional storage, treatment or transfer sites are prohibited in the ~~hurricane vulnerability zone~~ CHHA.
- E. New construction of residential multifamily dwelling units resulting from a density/intensity increase from a plan amendment after *adoption date* shall provide for hurricane shelter mitigation. Such mitigation for the impacts attributable to the development shall include one or a combination of the following: payment of a hurricane mitigation shelter fee, contribution of land, or construction of hurricane shelters. A hurricane shelter mitigation fee shall be provided prior to issuance of the certificate of occupancy for the dwelling unit(s), and calculated in accordance with the following formula: TBD. If the property owner elects to contribute land or construct hurricane shelter space, a binding agreement shall be executed regarding such mitigation prior to issuance of a building permit for construction of the residential units.
- F. Construction, expansion or substantial renovations of hotel uses shall provide a Hurricane Evacuation and Closure Plan that complies with all Pinellas County and City of St. Petersburg hurricane evacuation plans and procedures to ensure orderly evacuation of guests and visitors pursuant to the Pinellas County Code, Chapter 34, Article III.
- G. New construction of multi-family residential dwelling units shall provide a Hurricane Evacuation and Re-entry Plan requiring mandatory evacuation in accordance with Emergency Management Directives. Such requirements shall be incorporated into a legally binding document such as lease documents, condominium rules, homeowner rules, or other such method approved by the POD.

16.30.040.2. – CHHA Design Standards.

A. Purpose: The City of St. Petersburg is committed to improving the capacity to endure and quickly recover from coastal hazards. This section is intended to ensure that developments are more resilient to storm surge, mitigate for service and infrastructure needs during and immediately following major storm events, and enable safe re-occupation following an evacuation or weather event.

B. All new or substantially improved multi-family structures shall comply with one of the following:

1. The lowest habitable floor and all MEP systems shall be at a minimum of base flood elevation (BFE) + 2 feet of freeboard and shall utilize Table X to identify additional required activities. The point system provides options within ~~four~~ two components and each development shall achieve a minimum number of points, with at least X points from each component selected from the menu of options shown in the following table, based on the number of dwelling units within the development as shown below.

- 3 to 5 units: X points total, no less than X point per component.
- 6 to 29 units: X points total, no less than X points per component.
- 30 to 89 units: X points total, no less than X points per component.
- 90 to 199 units: X points total, no less than X points per component.
- 200 or more units: X points total, no less than X points per component.

Or

2. The lowest habitable floor and all MEP systems shall be at a minimum of base flood elevation (BFE) + 2 feet of freeboard and the structure shall achieve LEED Gold certification or higher and shall achieves a minimum of X points from the Recovery component.

Or

3. The lowest habitable floor and all MEP systems shall be at a minimum of base flood elevation (BFE) + 2 feet of freeboard and the structure contains a minimum of 20% (the ULI team has suggested a minimum of 20%, but defers to the City's workforce housing goals to better inform the appropriate percentage of units) of dwelling units dedicated to workforce housing and achieves a minimum of X points from the Recovery component.

Or

4. For structures designated as historically significant, as defined by XXX, the construction, expansion, or substantial renovation shall achieve a minimum of X points from the Recovery component and develop an evacuation plan in accordance with local mitigation strategies.

Table 1 below details the ULI Technical Assistance Panel’s response to the *Draft Point System For Multi-Family Residential Development* provided by the City of St. Petersburg.

The panel spent a significant portion of the 2 days examining each of the development criteria provided in the original draft of the points system provided by the city. Each criterion for points was evaluated for practicality, resilience value & intent, clarity and unintended consequences.

The table below goes line by line through the original draft point system and provides the ULI TAP Team’s recommended changes and clarifying comments on why changes were made.

- For easy reference, each of the original development activities/criteria has been given a number
- “Development Activities” (actions that earn points) are referred to as “criterion/criteria” in the commentary below.

[ORIGINAL DRAFT]

TABLE 1: POINT SYSTEM FOR MULTI-FAMILY RESIDENTIAL DEVELOPMENT

COMPONENT 1: RISK REDUCTION

		DEVELOPMENT ACTIVITIES / CRITERIA FOR POINTS
#1	ORIGINAL DRAFT:	Construct building to meet design requirements of next higher classification of Risk Category, per ASCE 7.
	RECOMMENDED CHANGE:	Construct building to meet design requirements of next higher classification of Risk Category, per ASCE 7 <u>OR</u> <u>Increase design wind speed from ASCE-7 recommendations and apply Miami-Dade High Velocity Hurricane Zone (HVHZ) standards for <u>current classification</u> of Risk Category</u> <u>OR</u> <u>Increase design wind speed from ASCE-7 recommendations and apply Miami-Dade High Velocity Hurricane Zone (HVHZ) standards of the <u>next higher classification</u> of Risk Category, per ASCE 7</u>

	COMMENTS:	<p><i>Considering the damage inflicted by Hurricane Michael and the increasing frequency of major hurricanes, the City of St. Petersburg may wish to consider strengthening its building code as it relates to wind resistance. ASCE-7 includes minimum wind speeds required for the design of buildings and other structures for various risk categories, and it is reasonable to offer additional points for applying wind criteria for the next risk category. Additionally, the city may wish to consider the implementation of High Velocity Hurricane Zone criteria. Utilized in Miami-Dade and Broward Counties, HVHZ criteria calls for specific resilient building materials and other products that meet the rigorous testing requirements of the HVHZ, going above and beyond the requirements of the Florida product approval.</i></p> <p><i>**Please note that the scale of options above should award progressively more points.</i></p> <p><i>***If HVHZ is already required in the City, we recommend not awarding points.</i></p>
#2	ORIGINAL DRAFT:	<p>Elevate finished floor above minimum 2 feet required (per ASCE 24 & Floodplain regulations)</p>
	RECOMMENDED CHANGE:	<p>Elevate the first habitable/residential floor beyond the required Base Flood Elevation (BFE) + 2 feet of Freeboard:</p> <ul style="list-style-type: none"> • XX points for each additional foot of elevation above 2ft+ BFE
	COMMENTS:	<p><i>The ULI team recommends the city maintain the existing requirement for minimum elevation of first habitable/residential floor, at minimum, and reiterate this requirement in the body copy of the CHHA LDR Code Amendment under the 16.30.040.2. – CHHA Design Standards section. As noted in the recommendation, the city should consider implementing a calculated minimum elevation by applying “conservative” SLR projections adopted by the Regional Planning Council in 2019 to current BFE. Developments would then be the greater of existing strategy of BFE +2 feet or BFE projected in minimum of 20 years design life. Please note that ULI has named the conservative projections but the city may want to review for design impact from projected design life before implementing in code.</i></p> <p><i>Points should be considered for <u>each</u> additional foot of elevation of the habitable floor beyond the 2+BFE already required. This builds in flexibility and scalability. For example, a town home can earn some points for accommodating 3ft+BFE, and a larger multifamily project that invests in elevating residential units and stacking them above a ground floor garage would (and should) be rewarded many more points. The garage example is a much higher investment for the developer, provides a much higher resilience value, and removes the risk of residential flooding.</i></p>

#3	ORIGINAL DRAFT:	Elevate mechanical systems above minimum 2 feet required (per ASCE 24 & Floodplain regulations)
	RECOMMENDED CHANGE:	<p>Elevate the mechanical system beyond the required Base Flood Elevation (BFE) + 2 feet:</p> <ul style="list-style-type: none"> • XX points for each additional foot of elevation above 2ft+ BFE, up to XX feet <u>OR</u> • XX points for installing mechanical, electrical and plumbing (MEP) equipment or back-up systems such as generators on the roof OR an ancillary structure that elevated to the most conservative (highest) flood elevation produced by the recent SLOSH model.
	COMMENTS:	<p><i>Similar to the comments for development activity #2, the ULI team recommends the city maintain the existing requirement for minimum elevation of mechanical systems and reiterate this requirement in the body copy of the CHHA LDR Code Amendment under the 16.30.040.2. – CHHA Design Standards section.</i></p> <p><i>Scalable points should be considered for <u>each</u> additional foot of elevation beyond the 2+BFE already required up to XX additional feet. The highest amount of points should be given to projects that relocate MEP to the roof OR an ancillary structure that elevated to the most conservative flood elevation produced by the recent SLOSH model, because this ensures they are free from any risk of flooding.</i></p>
#4	ORIGINAL DRAFT:	Construct an impact-resistant roof (Are some materials better than others, metal?)
	RECOMMENDED CHANGE:	Construct an impact-resistant roof <u>OR fully-adhered roof with parapets located every 3 feet</u>
	COMMENTS:	<i>Fully adhered roof attachments can also provide better wind uplift ratings with fewer seams; more symmetrical wind loadings; eliminates roof fasteners that penetrate the roof membrane;</i>
#5	ORIGINAL DRAFT:	Install impact resistant glazing (or operable hurricane shutters, one or other is required, but is one preferable and should be incentivized?)

	RECOMMENDED CHANGE:	Install impact resistant glazing (or operable hurricane shutters, one or other is required, but is one preferable and should be incentivized?) [DELETE]
	COMMENTS:	<i>Removed for redundancy. This is already well-covered by code and shouldn't merit points when compared to other criteria in this table. That being said, hurricane shutters are less preferential than impact glazing.</i>
#6	ORIGINAL DRAFT:	Protect coastal property with a living shoreline (LSL). (LSLs use natural materials to stabilize the shoreline and maintain valuable fish and wildlife habitat; LSLs utilize a variety of materials such as wetland plants, oyster shell, coir fiber logs, sand, wood, and native rock.)
	RECOMMENDED CHANGE:	Protect coastal property with a living shoreline (LSL) <u>per the US Army Corps of Engineers (USACE) Living Shoreline Permit Standard.</u> <i>(LSLs use natural materials to stabilize the shoreline and maintain valuable fish and wildlife habitat; LSLs utilize a variety of materials such as wetland plants, oyster shell, coir fiber logs, sand, wood, and native rock.)</i>
	COMMENTS:	<i>Added in a reference to the US Army Corps of Engineers (USACE) Living Shoreline Permit Standard. This will provide a consistent standard for what qualifies as a "LSL" and ensure the investment is worthy of points and meets the level of mitigation desired.</i>
#7	ORIGINAL DRAFT:	Design building located in the Coastal A Flood Zone to Flood Zone V standards
	RECOMMENDED CHANGE:	Design building located in the Coastal A Flood Zone to Flood Zone V standards <u>or the most conservative (highest) flood elevation produced by the recent SLOSH model.</u> = XX Points
	COMMENTS:	<i>The city asked if this criterion was the same as that stated in criterion #1. They have some similarities but are not the same. The Flood Zone V standards are more focused on flooding, with</i>

		<p><i>a particular focus on protecting coastal areas that would likely be subjected to High Velocity Wave Action (HVWA) during a storm.</i></p> <p><i>Flood Zone V standards may require resilient upgrades that may not make sense for areas that have no chance of High Velocity Wave Action (HVWA).</i></p> <p><i>The city might consider offering more points for sites right at the waterfront if they pursue this more stringent rule, since they may be subject to waves. With sea level rise, wave patterns will tend to shift more towards inland. Buildings in V or Coastal A Zones should either build open foundations so the water can flow below the structure (can be used for parking), with a small enclosure (up to 300sqf) for access. You can enclose it, but only with breakaway walls that are designed to purposely fail in the event of a flood.</i></p>
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Component 2: Recovery

#8	ORIGINAL DRAFT:	Establish operating procedures for how the project will handle loss of off-site or grid power, transition to a backup source of power, and transition back to normal operation.
	RECOMMENDED CHANGE:	Establish operating procedures for how the project will handle loss of off-site or grid power, transition to a backup source of power, and transition back to normal operation. [DELETE]
	COMMENTS:	<p><i>Redundant -- This should be an inherent component of the 'Hurricane Evacuation and Re-entry Plan' required of all new construction of multi-family dwelling units as stated in 16.30.040.1 - Development Regulation G in the draft CHHA LDR Code Amendment. It also may be redundant with many of the development activities below (see #9 thru #16). Projects with generators and back-up power sources, etc. should already have procedures in place for using them.</i></p> <p><i>For clarification purposes, it may be worth adding this criterion under 16.30.040.1 - Development Regulation G in the draft CHHA LDR Code Amendment. Because of the crossover with other criteria in this table, the ULI team does not believe this should merit points.</i></p>
#9	ORIGINAL DRAFT:	Generate no less than 75% of the electricity expected to be used by the development from on-site solar and/or wind energy sources
	RECOMMENDED CHANGE:	<p><u>Renewable Energy Sources:</u></p> <p>Generate a percentage (see options below) of the electricity expected to be used by the development from on-site solar and/or wind energy sources:</p>

		a) 75–100% = XX points b) 50-74% = XX points c) 26-49% = XX points d) At least 25% = XX points														
	COMMENTS:	<i>For clarity, combine criteria #9, #10, #13 & #14 Under one “Renewable” heading. Create a sliding points scale based on percentage of electricity generated by on-site renewable systems. These criteria are important for getting people back online quickly after a storm and align well with the goals of the ISAP and Bloomberg’s Climate Challenge Grant. Adding flexibility and a percentage scale will encourage more developers to consider investing in renewables.</i>														
#10	ORIGINAL DRAFT:	Generate no less than 50% of the electricity expected to be used by the development from on-site solar and/or wind energy sources														
	RECOMMENDED CHANGE:	Generate no less than 50% of the electricity expected to be used by the development from on-site solar and/or wind energy sources [DELETE]														
	COMMENTS:	See comments for #9.														
#11	ORIGINAL DRAFT:	On-site battery storage of solar generated power with X amount of capacity														
	RECOMMENDED CHANGE:	<p>On-site battery storage of solar generated power to keep critical functions working in the event of power failure:</p> <table border="1"> <tr> <td>(A)</td> <td>Life Safety Features*</td> <td>XX Points</td> </tr> <tr> <td>(B)</td> <td>(A) + At least 100% of Normal Load of Common Areas</td> <td>XX Points</td> </tr> <tr> <td>(C)</td> <td>(A) + (B) + Lighting & Refrigeration Residential Units</td> <td>XX Points</td> </tr> <tr> <td>(D)</td> <td>(A) + (B) + (C) + HVAC in Residential Units</td> <td>XX Points</td> </tr> <tr> <td>(D)</td> <td>80-100% of Normal Load of Entire Building</td> <td>XX Points</td> </tr> </table> <p>*Types of circuits that promote “Life Safety” to be powered by onsite battery storage which are in addition to current requirements of Emergency exit lighting requirements (i.e., NFPA):</p> <ul style="list-style-type: none"> Emergency exit lighting that recharges batteries of emergency exit lighting. 	(A)	Life Safety Features*	XX Points	(B)	(A) + At least 100% of Normal Load of Common Areas	XX Points	(C)	(A) + (B) + Lighting & Refrigeration Residential Units	XX Points	(D)	(A) + (B) + (C) + HVAC in Residential Units	XX Points	(D)	80-100% of Normal Load of Entire Building
(A)	Life Safety Features*	XX Points														
(B)	(A) + At least 100% of Normal Load of Common Areas	XX Points														
(C)	(A) + (B) + Lighting & Refrigeration Residential Units	XX Points														
(D)	(A) + (B) + (C) + HVAC in Residential Units	XX Points														
(D)	80-100% of Normal Load of Entire Building	XX Points														

		<ul style="list-style-type: none"> Overhead lighting, for every other fixture in common areas. (greater than NFPA emergency generator minimum requirements)
	COMMENTS:	<p><i>When considering energy savings alone, battery technology isn't efficient and cost effective enough just yet to incent most multifamily projects to invest in solar and storage. Systems typically have a poor economic return without accounting for savings due to avoided outage costs. Incorporating avoided outage costs triples the annual savings delivered by the solar+storage systems for multifamily.</i></p> <p><i>While the cost-effectiveness of solar storage to support energy resilience remains out of reach for many property owners, it is clear that solar plus storage will become cheaper, more robust, and more powerful over the coming years, in both centralized and distributed applications.</i></p> <p><i>Even if semi-aspirational, the ULI team encourages the city to keep this criterion in place and consider it to be on the top end of the points allocation due to cost and resilience value being high.</i></p> <p><i>NOTE: This criteria compliments #9 criteria about renewables well and is deserving of additional points beyond those allocated to #9. Recommendations</i></p>
#12	ORIGINAL DRAFT:	<p>Install a cool roof on at least 25% [sliding scale?] of the total roof area of the development</p> <p>[Add to definition section]</p>
	RECOMMENDED CHANGE:	<p>Install a cool/high-reflectance roof (coating that is white or has special reflective pigments that reflect sunlight) on at least 75% of the total roof area of the development, with a minimum SRI (solar reflectance index value) of 39 and in accordance with the standards set by the HVWZ.</p>
	COMMENTS:	<p><i>Through additional criteria (#+25, later in this table), the ULI team has made the distinction between a relatively inexpensive white paint "cool roof" and the more expensive alternative, a green roof. Cool roofs may be easier to implement but may not be very efficient over the long term because they lose reflective capacity. Green roofs merit more points.</i></p> <p><i>The number 39 is the SRI number from LEED v4 credit SS7.2.</i></p>
#13	ORIGINAL DRAFT:	<p>Generate no less than 25% of the electricity expected to be used by the development from on-site solar and/or wind energy sources</p>

	RECOMMENDED CHANGE:	Generate no less than 25% of the electricity expected to be used by the development from on-site solar and/or wind energy sources [DELETE]
	COMMENTS:	See comments for #9.
#14	ORIGINAL DRAFT:	Generate no less than 25% of the electricity needed expected to be used by the development from on-site solar and/or wind energy sources
	RECOMMENDED CHANGE:	Generate no less than 25% of the electricity needed expected to be used by the development from on-site solar and/or wind energy sources [DELETE]
	COMMENTS:	See comments for #9. Appears to be the same as #13.
#15	ORIGINAL DRAFT:	Install a geothermal energy heating & cooling system serving all residential units and common areas
	RECOMMENDED CHANGE:	Install a geothermal energy heating & cooling system <u>that serves at least 75% of the project's residential units.</u>
	COMMENTS:	<i>Many geothermal projects can cover the majority of residential units, but need to utilize different means (like mini splits) for storage areas, small commercial units, and some other common areas, etc. The Pearl development in Tampa Heights is a good example of this. The ULI team has added more flexibility to this criterion to avoid disqualifying projects of merit from receiving points and to avoid the unintended consequence of disincentivizing developers from pursuing geothermal energy because the threshold for points feels unattainable.</i>
#16	ORIGINAL DRAFT:	Equip the project with at least one alternative, independent source of electricity supply so that the project is capable of fully operating if a primary source of power experiences interruption
	RECOMMENDED CHANGE:	Equip the project with at least one alternative, independent source of electricity supply so that the project is capable of fully operating if a primary source of power experiences interruption [DELETE]

	COMMENTS:	<i>Feels redundant and can be achieved through criteria #9, #11 and #23</i>
#17	ORIGINAL DRAFT:	Pre-wire all units to accept power provided by on-site solar panels and/or wind turbines
	RECOMMENDED CHANGE:	None
	COMMENTS:	<i>This is forward thinking and will allow developments to retrofit and add renewable sources as they become more economically feasible. Norfolk has a similar option.</i>
#18	ORIGINAL DRAFT:	Install a 20+ SEER HVAC system in each dwelling unit
	RECOMMENDED CHANGE:	None
	COMMENTS:	<i>ULI team agreed with promotion of highest SEER values</i>
#19	ORIGINAL DRAFT:	Install a 16-19 SEER HVAC system in each dwelling unit
	RECOMMENDED CHANGE:	None
	COMMENTS:	<i>ULI team agreed with promotion of higher SEER values.</i>
#20	ORIGINAL DRAFT:	Install multi-room mini-split heating and cooling systems in each unit

	RECOMMENDED CHANGE:	Install <u>efficient, zone-controlled</u> heating and cooling systems in each <u>residential</u> unit (<u>mini-splits, or smart thermostats, etc.</u>)												
	COMMENTS:	<i>Expanded criterion definition beyond only mini-splits</i>												
#21	ORIGINAL DRAFT:	Install a solar or tank-less water heating system in each unit												
	RECOMMENDED CHANGE:	Install a solar or tank-less water heating system in each <u>residential</u> unit												
	COMMENTS:	<i>None</i>												
#22	ORIGINAL DRAFT:	Install no fewer than 2 operable windows on no fewer than two exterior walls in each unit												
	RECOMMENDED CHANGE:	<i>Cross ventilation for each residential unit (no less than 2 openings)</i>												
	COMMENTS:	<i>Avoid unintended consequences and edit this to be broader. Goal is to encourage flow through ventilation in case of power outages.</i>												
#23	ORIGINAL DRAFT:	Install a generator for power generation to keep critical functions (refrigerator, freezer, basic lighting, healthcare appliances, etc.) working in the event of power failure												
	RECOMMENDED CHANGE:	<p>Install a generator for power generation to keep critical functions working in the event of power failure:</p> <table border="1" data-bbox="537 1549 1419 1684"> <tr> <td>(A)</td> <td>Life Safety Features*</td> <td>XX Points</td> </tr> <tr> <td>(B)</td> <td>(A) + Refrigerators, Freezers, Healthcare Appliances</td> <td>XX Points</td> </tr> <tr> <td>(C)</td> <td>(A) + (B) + HVAC in common area</td> <td>XX Points</td> </tr> <tr> <td>(D)</td> <td>(A) + (B) + (C) + HVAC in each residential unit</td> <td>XX Points</td> </tr> </table> <p>*Types of circuits that promote “Life Safety” to be powered by emergency generators which are in addition to current requirements of Emergency exit lighting requirements (i.e., NFPA):</p> <ul style="list-style-type: none"> • Emergency exit lighting that recharges batteries of emergency exit lighting. 	(A)	Life Safety Features*	XX Points	(B)	(A) + Refrigerators, Freezers, Healthcare Appliances	XX Points	(C)	(A) + (B) + HVAC in common area	XX Points	(D)	(A) + (B) + (C) + HVAC in each residential unit	XX Points
(A)	Life Safety Features*	XX Points												
(B)	(A) + Refrigerators, Freezers, Healthcare Appliances	XX Points												
(C)	(A) + (B) + HVAC in common area	XX Points												
(D)	(A) + (B) + (C) + HVAC in each residential unit	XX Points												

		<ul style="list-style-type: none"> Overhead lighting, for every other fixture in common areas. (greater than NFPA emergency generator minimum requirements)
	COMMENTS:	<p>To encourage the installation of on-site generators in multi-family developments large and small, we have created a sliding point scale to reward different levels of generator coverage. Restoration of at least minimum life safety features in a multifamily development will be critical component to getting residents back into their residences and ultimately restoring services after an evacuation event.</p>
#24	ORIGINAL DRAFT:	Install highly-reflective blinds/shades or window film/tint to reduce solar gain
	RECOMMENDED CHANGE:	Install highly-reflective blinds/shades, <u>low-E</u> window film/tint, <u>external/structural shade</u> to reduce solar gain.
	COMMENTS:	None

TABLE 2: ADDITIONAL/NEW CRITERIA PROPOSED BY ULI TEAM (Not in the original draft of point system)

+25	NEW CRITERIA	<p>Incorporation of a Green Roof to reduce stormwater-runoff and solar gain. (A green roof is a layer of vegetation planted over a waterproofing system that is installed on top of a flat or slightly-sloped roof).</p> <ul style="list-style-type: none"> 10% of Total Roof Area = XX Points 30% of Total Roof Area = XX Points 50% of Total Roof Area = XX Points 75%+ of Total Roof Area = XX Points
	COMMENTS:	<p>The ULI team thought it was important to make a distinction between a cool roof (#12) and a green roof – and offer both in the point system. A green roof is more expensive to build and maintain and has the added benefit of reducing stormwater runoff. A green roof should earn more points than a cool roof. Building in a points scale to this criterion recognizes that a completely green roof may not be attainable, but a partial green roof still warrants points. Some projects may combine both a partial green roof and partial cool roof – earning points from both criteria.</p>

+26	NEW CRITERIA	<p>Natural Buffers: Setbacks are determined by zoning. Extra points can be earned for nature-based features in addition to setback.</p> <ul style="list-style-type: none"> a. Stormwater Retention (bioswales, rain gardens, rainwater harvesting/cisterns, stormwater harvesting, etc.) b. Appropriate and beneficial plantings (native, drought tolerant, salt adapted)
	COMMENTS:	<p><i>Worth noting -- To encourage the practice of using stormwater as an asset, Pinellas County has included incentives within its Land Development Code that allow open space requirements to be satisfied through green infrastructure stormwater management techniques. Refer to Chapter 138, Zoning, of the County Land Development Code.</i></p>
+27	NEW CRITERIA	<p>Contribution to conservation fund in lieu of ability to achieve points in the 'Nature Based Solutions' component</p>
	COMMENTS:	<p><i>Zoning administrator should devise a system for what constitutes as an appropriate contribution amount based on project size/number of units and relative to the cost of the other 'Nature Based Solutions' criteria for earning points. The conservation funds could go towards purchasing lands for preservation and retreat in the most vulnerable areas of the CHHA and/or repetitive loss areas.</i></p>
+28	NEW CRITERIA	<p>Devote space onsite to the creation of a community serving Resilience Hub.</p> <p>[Defined as <u>community-serving</u> facilities meant to both <u>support residents of the surrounding area</u> and coordinate resource distribution and services before, during or after a natural hazard event. The hub should be resourced by community organizations to meet the needs of the community during an extreme event, meaning it must maintain food, water, and emergency supplies. Hubs should be able to remain operational during an extended power outage, ideally relying on multiple types of energy generation such as solar and storage.]</p>
	COMMENTS:	<p>https://www.usdn.org/uploads/cms/documents/usdn_resiliencehubs_2018.pdf</p>

+29	NEW CRITERIA	<p>Incorporate and plan for a Resilient Common Area that serves residents of the project.</p> <p>This space should meet the needs of residents during and (most importantly) immediately following an extreme event, meaning it must maintain food, water, and emergency supplies. The Common Area’s HVAC, basic lighting and outlet power should be able to remain operational during an extended power outage, ideally relying on multiple types of energy generation such as solar and storage.</p>
	COMMENTS:	<p><i>As we learned from Hurricane Irma, having a space onsite with air-conditioning, power for phone charging, water, etc. for residents during post-storm recovery and prolonged power outages is critically important and can reduce the burden on city resources.</i></p>
+30	NEW CRITERIA	<p>Contribution to Emergency Shelter Fund to help pay for upgrades to existing shelters and the construction of new shelters</p>
	COMMENTS:	<p><i>Planning staff & Emergency Management should devise a system for what constitutes an appropriate contribution amount based on project size/number of units and relative to the cost of the other 'Recovery' criteria for earning points.</i></p>
+31	NEW CRITERIA	<p>Innovation Points (Resilient solutions beyond those found in this table will be considered for points at the discretion of the zoning administrator)</p>
	COMMENTS:	<p><i>In recognition of the fact that (a) the proposed CHHA LDR Code Amendment covers a wide range of multifamily project types and scale, and (b) the technologies and innovation driving resilient solutions for coastal communities are constantly evolving – the ULI team strongly recommends including the opportunity to earn “Innovation Points” in each of the four Resilience Components that make up the points system.</i></p> <p><i>This gives developers the flexibility to pursue innovative resilient solutions best suited for their projects and makes the code adaptable to advancements in resilient technologies. Innovation points should be considered and allotted at the discretion of the zoning administrator.</i></p>

Table 3 below:

1. **Categorizes the Development Activities/ Points Criteria into 4 components:**
 - a. Structural Mitigation
 - b. Energy Efficiency
 - c. Nature Based Solutions
 - d. Recovery

2. **Rates the criteria by**
 - a. Resilience Value
 - b. Cost to Developer

This table reflects the recommended changes of the ULI team as outlined in tables 1 and 2 above.

TABLE 3: POINT SYSTEM FOR MULTI-FAMILY RESIDENTIAL DEVELOPMENT			
COMPONENT 1: STRUCTURAL MITIGATION			
	DEVELOPMENT ACTIVITY	RESILIENCE VALUE	EXPECTED COST
S1	<p>Construct building to meet design requirements of next higher classification of Risk Category, per ASCE 7</p> <p><u>OR</u></p> <p>Increase design wind speed from ASCE-7 recommendations and apply Miami-Dade High Velocity Hurricane Zone (HVHZ) standards for current classification of Risk Category</p> <p><u>OR</u></p> <p>Increase design wind speed from ASCE-7 recommendations and apply Miami-Dade High Velocity Hurricane Zone (HVHZ) standards of the next higher classification of Risk Category, per ASCE 7</p>	HIGH	HIGH
S2	<p>Elevate the first habitable/residential floor beyond the required Base Flood Elevation (BFE) + 2 feet of Freeboard:</p> <p>- XX points for each additional foot of elevation above 2ft+ BFE</p>	HIGH	HIGH

S3	<p>Elevate the mechanical system beyond the required Base Flood Elevation (BFE) + 2 feet:</p> <ul style="list-style-type: none"> XX points for each additional foot of elevation above 2ft+ BFE, up to XX feet <p><u>OR</u></p> <ul style="list-style-type: none"> XX points for installing mechanical, electrical and plumbing (MEP) equipment or back-up systems such as generators on the roof OR an ancillary structure that elevated to the most conservative flood elevation produced by the recent SLOSH model. 	HIGH	LOW
S4	Construct an impact-resistant roof OR fully-adhered roof with parapets located every 3 feet	HIGH	LOW
S5	Design building located in the Coastal A Flood Zone to Flood Zone V standards or the most conservative (highest) flood elevation produced by the recent SLOSH model.	HIGH	HIGH
S6	Innovation Points	-	-
COMPONENT 2: ENERGY EFFICIENCY			
	DEVELOPMENT ACTIVITY	RESILIENCE VALUE	EXPECTED COST
E1	<p><u>Renewable Energy Sources:</u></p> <p>Generate a percentage (see options below) of the electricity expected to be used by the development from on-site solar and/or wind energy sources:</p> <ul style="list-style-type: none"> e) 75–100% = XX points f) 50-74% = XX points g) 26-49% = XX points h) At least 25% = XX points 	HIGH	HIGH

E2	<p>On-site battery storage of solar generated power to keep critical functions working in the event of power failure:</p> <table border="1" data-bbox="404 359 1115 779"> <tr> <td data-bbox="404 359 505 415">(A)</td> <td data-bbox="505 359 932 415">Life Safety Features*</td> <td data-bbox="932 359 1115 415">XX Points</td> </tr> <tr> <td data-bbox="404 415 505 506">(B)</td> <td data-bbox="505 415 932 506">(A) + At least 100% of Normal Load of Common Areas</td> <td data-bbox="932 415 1115 506">XX Points</td> </tr> <tr> <td data-bbox="404 506 505 596">(C)</td> <td data-bbox="505 506 932 596">(A) + (B) + Lighting & Refrigeration Residential Units</td> <td data-bbox="932 506 1115 596">XX Points</td> </tr> <tr> <td data-bbox="404 596 505 686">(D)</td> <td data-bbox="505 596 932 686">(A) + (B) + (C) + HVAC in Residential Units</td> <td data-bbox="932 596 1115 686">XX Points</td> </tr> <tr> <td data-bbox="404 686 505 779">(D)</td> <td data-bbox="505 686 932 779">80-100% of Normal Load of Entire Building</td> <td data-bbox="932 686 1115 779">XX Points</td> </tr> </table> <p>*Types of circuits that promote “Life Safety” to be powered by onsite battery storage which are in addition to current requirements of Emergency exit lighting requirements (i.e., NFPA):</p> <ul data-bbox="293 961 1115 1157" style="list-style-type: none"> • Emergency exit lighting that recharges batteries of emergency exit lighting. • Overhead lighting, for every other fixture in common areas. (greater than NFPA emergency generator minimum requirements) 	(A)	Life Safety Features*	XX Points	(B)	(A) + At least 100% of Normal Load of Common Areas	XX Points	(C)	(A) + (B) + Lighting & Refrigeration Residential Units	XX Points	(D)	(A) + (B) + (C) + HVAC in Residential Units	XX Points	(D)	80-100% of Normal Load of Entire Building	XX Points	HIGH	HIGH
(A)	Life Safety Features*	XX Points																
(B)	(A) + At least 100% of Normal Load of Common Areas	XX Points																
(C)	(A) + (B) + Lighting & Refrigeration Residential Units	XX Points																
(D)	(A) + (B) + (C) + HVAC in Residential Units	XX Points																
(D)	80-100% of Normal Load of Entire Building	XX Points																
E3	Install a geothermal energy heating & cooling system that serves at least 75% of the project’s residential units.	MED	HIGH															
E4	Install a cool/high-reflectance roof (coating that is white or has special reflective pigments that reflect sunlight) on at least 75% of the total roof area of the development, with a minimum SRI (solar reflectance index value) of 39 and in accordance with the standards set by the HVWZ.	LOW	LOW															
E5	Pre-wire all units to accept power provided by on-site solar panels and/or wind turbines	LOW	LOW															
E6	Install a 20+ SEER HVAC system in each dwelling unit	MED	MED															
E7	Install a 16-19 SEER HVAC system in each dwelling unit	MED	MED															

E8	Install efficient, zone-controlled heating and cooling systems in each residential unit (mini-splits, or smart thermostats, etc.)	MED	MED
E9	Install a solar or tank-less water heating system in each residential unit	LOW	LOW
E10	Cross ventilation for each residential unit (no less than 2 openings)	LOW	LOW
E11	Install highly-reflective blinds/shades, low-E window film/tint, external/structural shade to reduce solar gain.	LOW	LOW
E12	Innovation	-	-
Component 3: Nature Based Solutions			
N1	Protect coastal property with a living shoreline (LSL) per the US Army Corps of Engineers (USACE) Living Shoreline Permit Standard. <i>(LSLs use natural materials to stabilize the shoreline and maintain valuable fish and wildlife habitat; LSLs utilize a variety of materials such as wetland plants, oyster shell, coir fiber logs, sand, wood, and native rock.)</i>	MED	MED
N2	Incorporation of a Green Roof to reduce stormwater-runoff and solar gain. (A green roof is a layer of vegetation planted over a waterproofing system that is installed on top of a flat or slightly-sloped roof). <ul style="list-style-type: none"> ○ 10% of Total Roof Area = XX Points ○ 30% of Total Roof Area = XX Points ○ 50% of Total Roof Area = XX Points ○ 75%+ of Total Roof Area = XX Points 	MED	MED
N3	Natural Buffers: Setbacks are determined by zoning. Extra points can be earned for nature-based features in addition to setback. <ul style="list-style-type: none"> a. Stormwater Retention (bioswales, rain gardens, rainwater harvesting/cisterns, stormwater harvesting, etc.) b. Appropriate and beneficial plantings (native, drought tolerant, salt adapted) 	MED	LOW

N4	Contribution to conservation fund in lieu of ability to achieve points in the 'Nature Based Solutions' component	HIGH	MED												
N5	Innovation	-	-												
Component 4: Recovery															
R1	Illumination and natural daylighting	HIGH	LOW												
R2	<p>Install a generator for power generation to keep critical functions working in the event of power failure:</p> <table border="1" style="margin-left: 40px;"> <tr> <td>(A)</td> <td>Life Safety Features*</td> <td>XX Points</td> </tr> <tr> <td>(B)</td> <td>(A) + Refrigerators, Freezers, Healthcare Appliances</td> <td>XX Points</td> </tr> <tr> <td>(C)</td> <td>(A) + (B) + HVAC in common area</td> <td>XX Points</td> </tr> <tr> <td>(D)</td> <td>(A) + (B) + (C) + HVAC in each residential unit</td> <td>XX Points</td> </tr> </table> <p>*Types of circuits that promote "Life Safety" to be powered by emergency generators which are in addition to current requirements of Emergency exit lighting requirements (i.e., NFPA):</p> <ul style="list-style-type: none"> • Emergency exit lighting that recharges batteries of emergency exit lighting. • Overhead lighting, for every other fixture in common areas. (greater than NFPA emergency generator minimum requirements) 	(A)	Life Safety Features*	XX Points	(B)	(A) + Refrigerators, Freezers, Healthcare Appliances	XX Points	(C)	(A) + (B) + HVAC in common area	XX Points	(D)	(A) + (B) + (C) + HVAC in each residential unit	XX Points	HIGH	HIGH
(A)	Life Safety Features*	XX Points													
(B)	(A) + Refrigerators, Freezers, Healthcare Appliances	XX Points													
(C)	(A) + (B) + HVAC in common area	XX Points													
(D)	(A) + (B) + (C) + HVAC in each residential unit	XX Points													
R3	Devote space onsite to the creation of a community serving Resilience Hub.	LOW	LOW												
R4	Incorporate and plan for a Resilient Common Area that serves residents of the project.	LOW	LOW												
R5	Contribution to Emergency Shelter Fund to help pay for upgrades to existing shelters and the construction of new shelters	HIGH	MED												
R6	Innovation Points	-	-												

Additional Recommendations

The ULI team commends the City of St. Petersburg for being proactive about hardening the CHHA to ensure that future multi-family development is resilient. Planning for the future of the CHHA

and other vulnerable areas of the city requires a balancing of sometimes competing city goals such as economic development, emergency management, resiliency, community development, workforce housing and growth management. Implementing a new approach to new multi-family development in the CHHA is a good opportunity to pilot a resilient code.

As it evaluates the implementation of this new code in the CHHA, the city should consider further increasing resiliency and reducing flood risk within the CHHA by applying elevated design standards to all development typologies. This follows the City of Norfolk example.

As the city prepares for a more resilient future and embarks on it's work for Vision 2050, other items to consider include:

- Incorporate specific resiliency goals for development and coastal defense as a guiding principle of the 2050 plan.
- Develop a more-fine grain approach to land use in the CHHA by:
 - Consider limited future density in areas that may be subject to daily tidal flooding due to sea level rise in the next couple of decades. Comprehensive infrastructure improvements should continue to be targeted in areas to prevent sunny day flooding.
 - Target specific areas for buyout, in the event of future disaster within repetitive loss geographies. These areas can serve as coastal defense.
 - In other areas that are only subject to coastal flooding by severe but infrequent storms, create a density boost that could assist in getting better resilient building stock and amenities.
 - Elsewhere, the city should consider tools to help encourage building owners to retrofit the existing building stock, at least by elevating MEP, installing water pumps, or footings for the deployment of flood panels in advance of a storm.
 - Consider a Transfer of Development Rights (TDR) / land swap solution from areas in the most vulnerable areas of the original CHHA to less vulnerable areas of the CHHA. This could boost preservation areas and result in a zero net gain of overall entitled density in the CHHA.
- Review height requirements in the CHHA to ensure there is no conflict between the elevated standard and existing requirements.
- Allow for portions of a parcel included in the CHHA to be placed into restricted development status in exchange for permitting redevelopment of remaining portion of a parcel, not within CHHA.
- Establish a fund that developers can pay into as a condition of permit for development in CHHA that either improves emergency response (i.e., hires drivers to evacuate residents), pays for improvements to existing shelters (i.e., adding food storage or generator back up to existing shelters), or contributes to the overall resiliency of the CHHA (i.e. funds grants to help vulnerable populations within the CHHA retrofit their properties with more resilient features, etc.).

CASE STUDY: THE CITY OF NORFOLK

The City of Norfolk, Virginia adopted a new zoning ordinance in January 2018 that included the goal of enhancing flood resilience and directing new more intense development to higher ground. The ordinance includes a Resilience Quotient system, which applies to all new development citywide, and establishes a Coastal Resilience Overlay (CRO) zone, where new development and redevelopment will have to comply with new flood resilience requirements, in the most flood prone areas and an Upland Resilience Overlay (URO), designed to encourage new development, in areas of the city with lower risk of flooding.

Resilient Quotient System Overview

The Resilience Quotient requires resilient development techniques to be incorporated into all new development projects, or substantial redevelopment projects. Projects where the cost of work is less than 50% of the assessed value of the building are exempt from meeting the Resilience Quotient.

Also exempted are LEED-certified buildings receiving a certification of gold or above and work on designated historic properties that maintains or enhances the historic character. (Single-family homes have a simpler method of achieving resilience available to them and thus are not a part of this discussion.) Developments not eligible for one of those exemptions must do one of the following – either meet a standard set of resilience conditions (including elevating mechanical equipment, installing systems to detain a certain amount stormwater on site, and installing systems that allow connection of generators, solar, wind or other locally generated power sources during power outages) or earn a required number of points from a point system.

For developers opting to use the point system, the number of points that must be earned in each category depend on the size and number of units included in the development proposal. For example, smaller developments of five or less dwelling units must earn 4 points, 1 each per component; larger developments of 200 or more dwelling units must earn 10 points, 2 per component. Similar scales are also included for non-residential development – per square foot of floor area. The system awards points for the following resilience measures for residential development (similar standards are tailored for non-residential development):

- Risk reduction - elevate mechanical equipment; construct impact resistant roof; construct structure to withstand 110-mile winds; and/or install hurricane resistant shutters.
- Stormwater management - install a green roof, rain-gardens, or other stormwater infiltration systems; use pervious paving systems; provide a community-garden space; preserve pre-development natural, native vegetation; provide for new tree-planting; and/or preserve large non-exotic trees on site.
- Energy resilience - generate electricity with on-site solar or wind power; install geothermal heating and cooling systems; install green walls; adopt energy efficient lighting; include wiring that allows connection to solar, wind or back-up generator; install cool roof; install solar or tankless water heating system; install back-up generator; provide EV charging stations; use vegetation to shade structure; and/or install reflective shades.

The ordinance also includes incentives for extinguishing development rights in the Coastal Resilience Overlay district. Points can be earned in the Upland Resilience zone by extinguishing development rights through acquisition of open space conservation easements or voluntary removal – via deed restriction or other method – of development rights in the CRO.

The new zoning ordinance was informed by prior planning documents: PlaNorfolk2030 (adopted in 2013), which is the city’s comprehensive plan, and Norfolk Vision 2100, which was adopted in 2016 and defined the city’s approach to flooding, sea-level rise, and long-term resilience.

The Resilience Quotient at a Glance

Overall

- Applies citywide to all new development and all substantial reconstructions.
- LEED Gold or equivalent properties are exempt
- Historic rehabs are exempt

Single Family

- Elevate 16 inches
- Store 200 gallons of rainwater
- Install generator switch

Multifamily

- Elevate 16 inches and capture first 1.25 inches of rainwater - or -
- Comply with point system requirements (3 components – risk reduction, stormwater management, energy resilience)

Non-Residential

- Elevate 8 inches and capture first 1.25 inches of rainwater - or -
- Comply with point system requirements (3 components – risk reduction, stormwater management, energy resilience)

Resilience Overlays

Coastal Resilience Overlay (CRO)

- Applies to all properties within a high-risk flood zone (V, A, or X-shaded)
- Requires additional 0.5 points from point system requirement for risk reduction component and stormwater management component or 25% more flood risk reduction and stormwater management capacity
- Requires native, salt tolerant plants
- Requires all parking areas and open space to be pervious
- Limits parking to 110% of the minimum required

Upland Resilience Overlay (URO)

- Applies to entire city outside high risk flood zones

- Allows up to four points to be counted towards the point system requirements for extinguishing a development right (through a conservation easement, deed restriction, or other such method) in the CRO

LESSONS LEARNED

- Include a range of options and alternatives for development, aligned with resilience goals.
- Be open and adaptive to change as the zoning code is implemented. Continually evaluate and amend, as required.
- Clearly connect the zoning code to a comprehensive strategy and goals for city-wide resiliency.
- Begin and maintain a dialogue with the local development community. Their feedback will be vital in fine-tuning the requirements.
- Track how the code is being implemented on a site-by-site basis. The innovative implementations that developers come up with can provide valuable case studies for future users.
- Be prepared to go “off book”. Each site is unique, and the code can’t possibly consider every possibility. In these unique circumstances, be prepared to adjust requirements.

Case Study: New York City

Zoning for Coastal Flood Resiliency

Since Hurricane Sandy in 2012, the NYC Department of City Planning (DCP) has been working with stakeholders across New York City (NYC)'s floodplain to develop zoning strategies that help promote resilient buildings and neighborhoods, and therefore reduce flood risk in the city's most vulnerable areas. This set of recommendations would improve upon and make permanent existing temporary zoning rules that were adopted on an emergency-basis after Sandy.

Zoning for Coastal Flood Resiliency would provide homeowners, business owners and practitioners living and working in the city's floodplain, the option to design or otherwise retrofit buildings to (a) reduce damage from future flood events, (b) be resilient in the long-term, and (c) potentially save on long-term flood insurance costs. Overall, implementation of Zoning for Coastal Flood Resiliency would improve the ability of the city's many flood-prone neighborhoods to withstand and recover quickly from future storms.

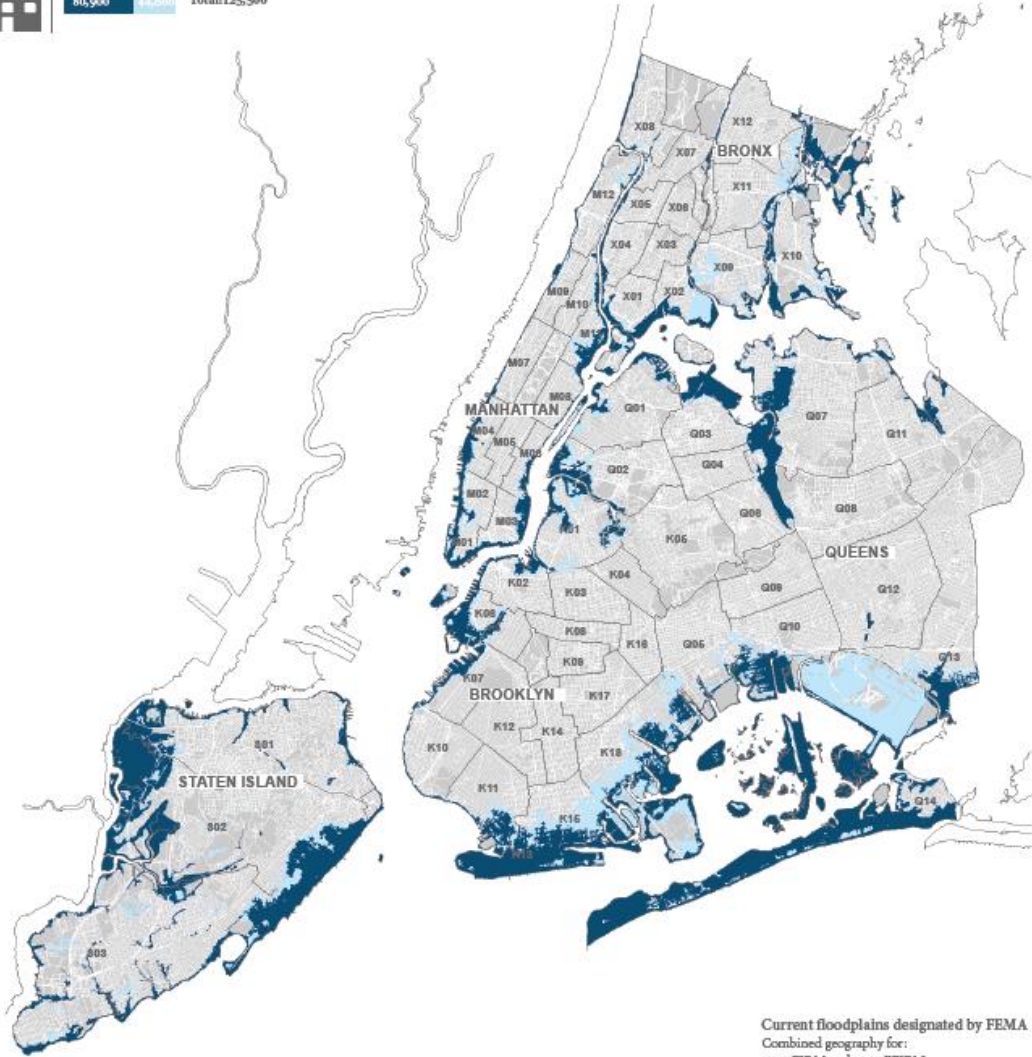
These recommendations have been drawn from lessons learned and initiatives implemented through the city's recovery efforts after Hurricane Sandy. They were developed based on analysis of resilient construction in the floodplain, through coordination with partner city agencies, and community feedback received during an extensive public engagement process.

Features of the preliminary recommendations include:

- 1. An expanded geography:**

Buildings in both the city's 1% annual chance floodplain and 0.2% annual chance floodplain would have access to rules that allow building owners to invest in resiliency improvements to fully meet or exceed flood-resistant construction standards, even when these standards are not required by the Federal Emergency Management Agency (FEMA) and Appendix G of the NYC Building Code.

1% and 0.2% annual chance floodplain



Current floodplains designated by FEMA
 Combined geography for:
 2007 FIRM and 2015 PFIRM

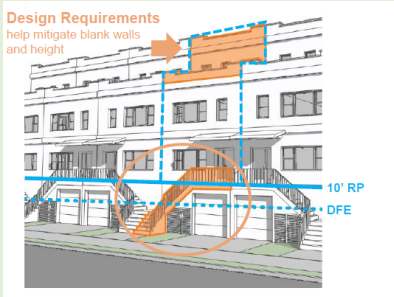
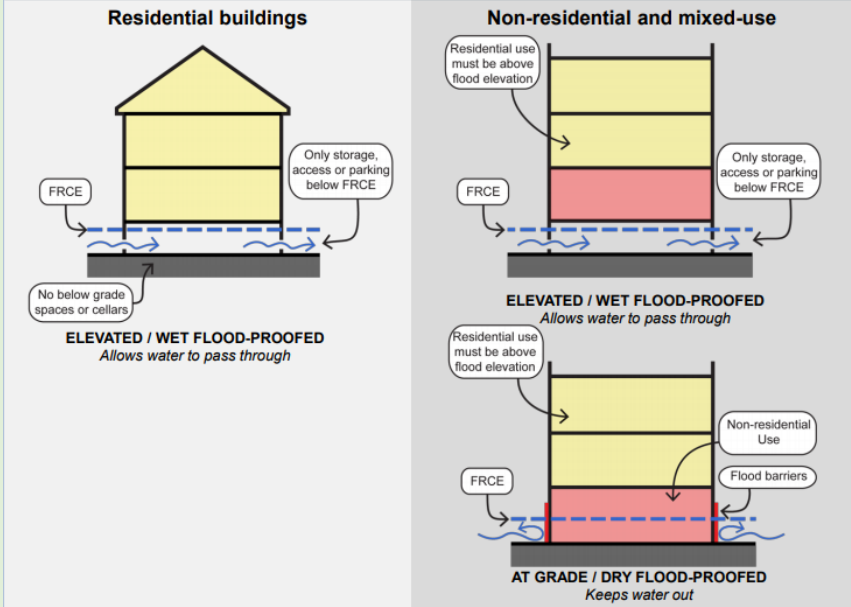
- 1% annual chance floodplain
- 0.2% annual chance floodplain
- Community District

Source: The floodplains are based on a combined geography for the 1% annual chance floodplain and 0.2% annual chance floodplain established by the FEMA 2007 Flood Insurance Rate Maps (FIRMs) and the FEMA 2015 Preliminary Flood Insurance Rate Maps (PFIRMs).

2. An enhanced building envelope:

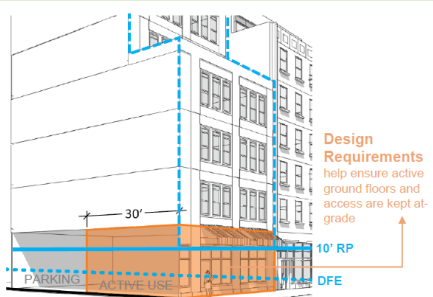
Zoning allowances coupled with enhanced design requirements would allow building owners to better accommodate sea level rise projections when designing new buildings or retrofitting existing ones, without creating negative impacts on the streetscape. This would increase the building's and its content's safety and allow flood insurance costs to be reduced, while ensuring an accessible design that makes the streetscape more inviting.

FEMA: FLOOD ZONE CONSTRUCTION STANDARDS



Height Allowances

for all building-types by allowing the envelope to be measured from the DFE or a higher Reference Plane (10' or 5', depending if within 1% or 0.2% floodplain)



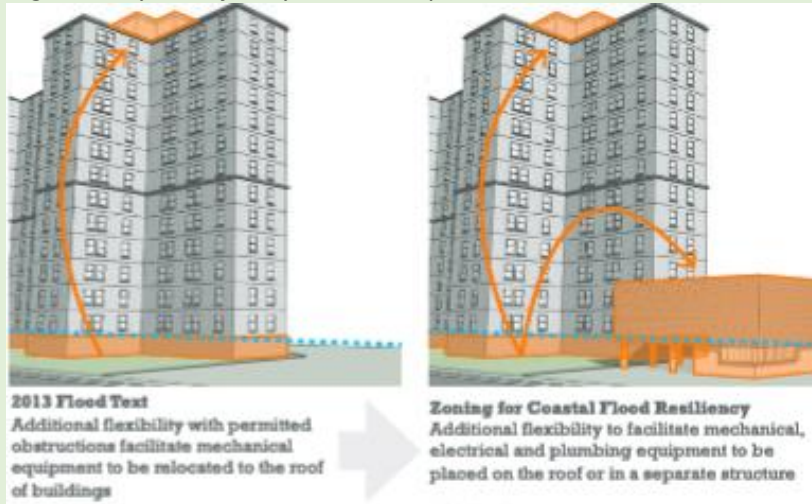
Floor Area Exemptions

for active uses (commercial and community facilities) that are dry-floodproofed and kept at grade, and any wet-floodproofed spaces

3. Alternatives for the relocation of important equipment:

Building owners would have additional zoning flexibility to relocate mechanical, electrical and plumbing (MEP) equipment or install back-up systems such as generators above areas at risk of being flooded, including on roofs or in new separate structures.

High density Multifamily MEP Example:



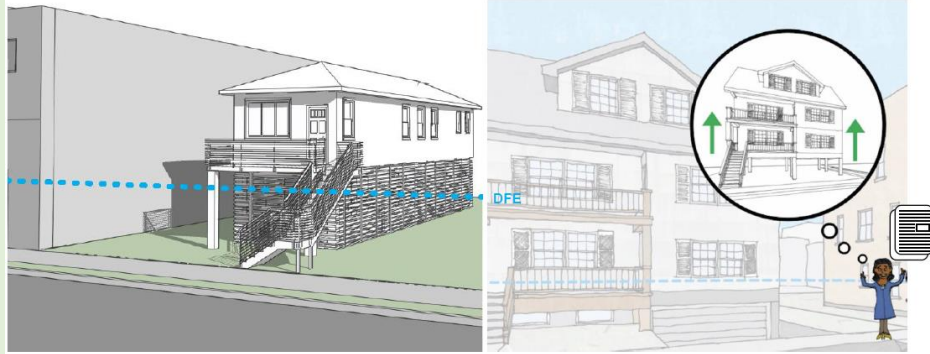
Low density Multifamily MEP Example:

<p>Issue Existing homes may need to safeguard their mechanical equipment by removing it from below-grade spaces, but there may be no place to put the equipment within the home.</p> <p>Solution Allow alternative locations for mechanical equipment for existing one- and two-family homes, such as rear and side yards.</p>	<p>Solution Additionally, allow accessory mechanical equipment on flat roofed accessory structures, when:</p> <ul style="list-style-type: none"> • Equipment is screened on all sides • Does not exceed 12 feet in height for shallow-pitch or flat roofs • Does not exceed 14 feet to the mid-point of the roof for steep-pitch roofs

<https://www1.nyc.gov/assets/planning/download/pdf/zoning/districts-tools/flood-test/flood-text-overview-presentation.pdf>

4. A zoning framework that facilitates recovery from future disasters:

Rules that make it easier for damaged buildings to be reconstructed would be enabled in the event of a future disaster. This would allow residents and neighborhoods to recover faster and allow the city to more quickly offer disaster assistance to those who are impacted.



Reconstruction allowances

Substantially-damaged non-conforming or non-complying buildings can rebuild to at least minimum resiliency standards

Documentation process

Aerial photographs/tax bills can be used to establish the existence of a building. A survey may be used to document non-compliances

In the long-term, Zoning for Coastal Flood Resiliency, in conjunction with coastal protection strategies and infrastructure improvements that are being pursued by the city and other state and federal agencies, will help to fully realize the vision of a more resilient NYC. To learn more, please visit: <https://www1.nyc.gov/assets/planning/download/pdf/plans-studies/flood-resiliency-update/zoning-for-flood-resiliency.pdf>

Other resiliency initiatives

Aside from Zoning for Coastal Flood Resiliency, DCP also works in shaping NYC's waterfront and waterways to promote growth, equity, resiliency and sustainability. This work is mainly conducted through the NYC Waterfront Revitalization Program (WRP), which establishes the City's policies for waterfront planning, preservation and development projects to ensure consistency over the long term. The goal of the program is to maximize the benefits derived from economic development, environmental conservation and public use of the waterfront. Projects that require certain federal, state and local discretionary actions that are located within and/or affect the Coastal Zone are reviewed by a relevant government agency to assess the consistency of a proposed activity or project with the WRP's ten policies.

One of these policies—Policy 6.2—sets guidelines for climate change adaptation, which requires applicants identify the site's vulnerabilities to coastal hazards, such as flooding, wave action, and erosion, and to demonstrate how the proposed design will address these vulnerabilities. It also guides applicants to refer to the Climate Resiliency Design Guidelines developed by the Mayor's Office of Resiliency, which recommend buildings to be designed to the 50th percentile sea level rise projections over the project's anticipated useful life, in addition to freeboard required by the Building Code.

The following link takes you to a document that NYC uses for waterfront development which dictates design strategies for shorelines under Policy 6.2:

<https://www1.nyc.gov/assets/planning/download/pdf/applicants/wrp/revisions-2017/policy-62-guidance-document-nov2018.pdf>

In addition to the WRP review, waterfront development is also shaped by Article VI, Chapter 2 of the NYC's Zoning Resolution, which addresses the form, size and location of new development, and the amount and quality of required waterfront public access areas. One of its main regulations, require

developments to maintain an open area along the shoreline, which is referred to as the waterfront yard. All residential and commercial developments are required to provide a waterfront yard that is 30 to 40 feet wide, depending on the district, along the entire shoreline. While this rule mainly serves the objective of allowing for the public access to the waterfront, it also helps protect natural resources in environmentally sensitive areas along the shore.

In the context of flood resiliency, required setbacks can also be useful as an interim measure to help prepare cities to be able to implement coastal protection measures and have the space to accommodate future resilient infrastructure investments.

[For more information, please consult the following link:](https://www1.nyc.gov/site/planning/zoning/districts-tools/waterfront-zoning.page)

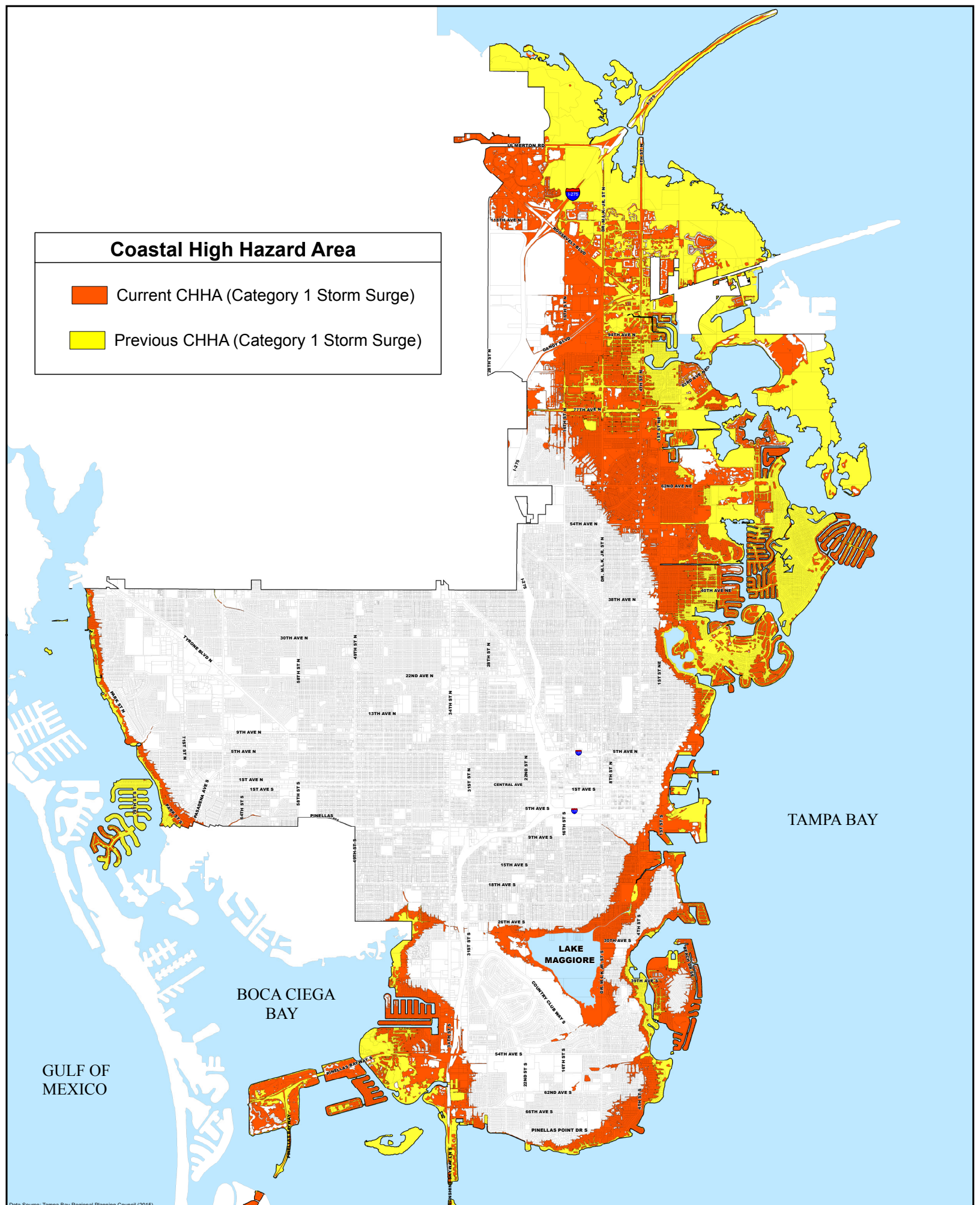
<https://www1.nyc.gov/site/planning/zoning/districts-tools/waterfront-zoning.page>

Coastal High Hazard Area

- Current CHHA (Category 1 Storm Surge)
- Previous CHHA (Category 1 Storm Surge)

Coastal High Hazard Area

- Current CHHA (Category 1 Storm Surge)
- Previous CHHA (Category 1 Storm Surge)



Data Source: Tampa Bay Regional Planning Council (2015), Pinellas County GIS (2017).

City of St. Petersburg

Planning and Economic Development Department

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