

# Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach NY Rising Community Reconstruction Plan



NY Rising Community Reconstruction Program

March 2014



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*Cover photo: Kate Murray, Town of Hempstead Supervisor*



# Foreword

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In the span of approximately one year, beginning in August 2011, the State of New York experienced three extreme weather events. Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy wreaked havoc on the lives of New Yorkers and their communities. These tragic disasters signaled that New Yorkers are living in a new reality defined by rising sea levels and extreme weather events that will occur with increased frequency and power. They also signaled that we need to rebuild our communities in a way that will mitigate against future risks and build increased resilience.

To meet these pressing needs, Governor Andrew M. Cuomo led the charge to develop an innovative, community-driven planning program on a scale unprecedented and with resources unparalleled. The NY Rising Community Reconstruction (NYRCR) Program empowers the State's most impacted communities with the technical expertise needed to develop thorough and implementable reconstruction plans to build physically, socially, and economically resilient and sustainable communities.

## Program Overview

The NYRCR Program, announced by Governor Cuomo in April of 2013, is a more than \$650 million planning and implementation process established to provide rebuilding and resiliency assistance to communities severely damaged by Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy. Drawing on lessons learned from past recovery efforts, the NYRCR Program is a unique combination of bottom-up community participation and State-provided technical expertise. This powerful combination recognizes not only that community members are best positioned to assess the needs and opportunities of the places where they live and work, but also that decisions are best made when they are grounded in rigorous analysis and informed by the latest innovative solutions.

One hundred and two storm-affected localities across the State were originally designated to participate in the NYRCR Program. The State has allocated each locality between \$3 million and \$25 million to implement eligible projects identified in the NYRCR Plan. The funding for these projects is provided through the U.S. Department of Housing and Urban Development

(HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) program.

Forty-five NYRCR Communities, each comprising one or more of the 102 localities, were created and led by a NYRCR Planning Committee composed of local residents, business owners, and civic leaders. Members of the Planning Committees were identified in consultation with established local leaders, community organizations, and in some cases municipalities. The NYRCR Program sets a new standard for community participation in recovery and resiliency planning, with community members leading the planning process. Across the State, more than 500 New Yorkers represent their communities by serving on Planning Committees. More than 400 Planning Committee Meetings have been held, during which Planning Committee members worked with the State's NYRCR Program team to develop community reconstruction plans and identify opportunities to make their communities more resilient. All meetings were open to the public. An additional 125-plus Public Engagement Events attracted thousands of community members, who provided feedback on the NYRCR planning process and proposals. The NYRCR Program's outreach has included communities that are traditionally underrepresented, such as immigrant populations and students. All planning materials are posted on the NYRCR Program's website ([www.stormrecovery.ny.gov/nyrcr](http://www.stormrecovery.ny.gov/nyrcr)), providing several ways for community members and the public to submit feedback on materials in progress.

Throughout the planning process, Planning Committees were supported by staff from the Governor's Office of Storm Recovery (GOSR), planners from New York State (NYS) Department of State (DOS) and NYS Department of Transportation (DOT), and consultants from world-class planning firms that specialize in engineering, flood mitigation solutions, green infrastructure, and more.

With the January 2014 announcement of the NYRCR Program's expansion to include 22 new localities, the program comprises over 2.7 million New Yorkers and covers nearly 6,500 square miles, which is equivalent to 14% of the overall State population and 12% of the State's overall geography.

The NYRCR Program does not end with this NYRCR Plan. Governor Cuomo has allocated over \$650 million of funding to the program for implementing projects identified in the NYRCR Plans. NYRCR Communities are also eligible for additional funds through the program’s NY Rising to the Top Competition, which evaluates NYRCR Communities across eight categories, including best use of technology in the planning process, best approach to resilient economic growth, and best use of green infrastructure to bolster resilience. The winning NYRCR Community in each category will be allocated an additional \$3 million of implementation funding. The NYRCR Program is also working with both private and public institutions to identify existing funding sources and create new funding opportunities where none existed before.

The NYRCR Program has successfully coordinated with State and Federal agencies to help guide the development of feasible projects. The program has leveraged the Regional Economic Development Council’s State Agency Review Teams (SARTs), comprised of representatives from dozens of State agencies and authorities, for feedback on projects proposed by NYRCR Communities. The SARTs review projects with an eye toward regulatory and permitting needs, policy objectives, and preexisting agency funding sources. The NYRCR Program is continuing to work with the SARTs to streamline the permitting process and ensure shovels are in the ground as quickly as possible.

On the pages that follow, you will see the results of months of thoughtful, diligent work by NYRCR Planning Committees, passionately committed to realizing brighter, more resilient futures for their communities.

## The NYRCR Plan

This NYRCR Plan is an important step toward rebuilding a more resilient community. Each NYRCR Planning Committee began the planning process by defining the scope of its planning area, assessing storm damage, and identifying critical issues. Next, the Planning Committee inventoried critical assets in the community and assessed the assets’ exposure to risk. On the basis of this work, the Planning Committee described recovery and resiliency needs and identified opportunities. The Planning Committee then developed a series of comprehensive reconstruction and resiliency strategies, and identified projects and implementation actions to help fulfill those strategies.

The projects and actions set forth in this NYRCR Plan are divided into three categories. The order in which the projects and actions are listed in this NYRCR Plan does not necessarily indicate the NYRCR Community’s prioritization of these projects and actions. **Proposed Projects** are projects proposed for funding through a NYRCR Community’s allocation of CDBG-DR funding. **Featured Projects** are projects and actions that the Planning Committee has identified as important resiliency recommendations and has analyzed in depth, but has not proposed for funding through the NYRCR Program. **Additional Resiliency Recommendations** are projects and actions that the Planning Committee would like to highlight and that are not categorized as Proposed Projects or Featured Projects. The Proposed Projects and Featured Projects found in this NYRCR Plan were voted for inclusion by official voting members of the Planning Committee. Those voting members with conflicts of interest recused themselves from voting on any affected projects, as required by the NYRCR Ethics Handbook and Code of Conduct.

NYRCR Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach Community is eligible for up to \$9.0 million in CDBG-DR implementation funds.<sup>1</sup>

While developing projects for inclusion in this NYRCR Plan, Planning Committees took into account cost estimates, cost-benefit analyses, the effectiveness of each project in reducing risk to populations and critical assets, feasibility, and community support. Planning Committees also considered the potential likelihood that a project or action would be eligible for CDBG-DR funding. Projects and actions implemented with this source of Federal funding must fall into a Federally-designated eligible activity category, fulfill a national objective (meeting an urgent need, removing slums and blight, or benefiting low to moderate income individuals), and have a tie to the natural disaster to which the funding is linked. These are among the factors that the Governor’s Office of Storm Recovery will consider, in consultation with local municipalities and nonprofit organizations, when determining which projects and actions are best positioned for implementation.

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<sup>1</sup> The following localities’ allocations comprise the NYRCR Community’s total allocation: East Atlantic Beach and Atlantic Beach Estates – \$6.0 million; Village of Atlantic Beach – \$3.0 million.



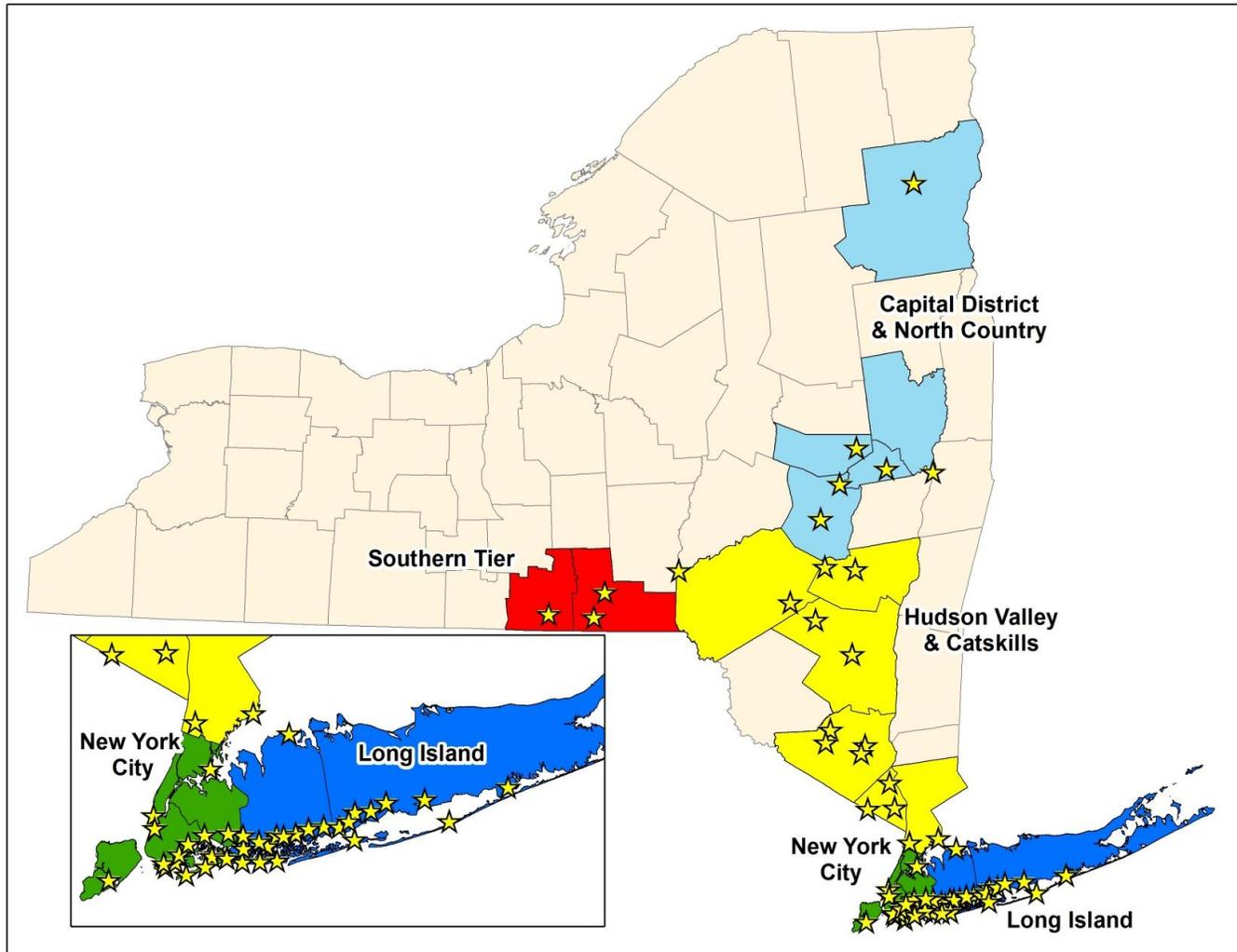
The total cost of Proposed Projects in this NYRCR Plan exceeds the NYRCR Community's CDBG-DR allocation to allow for flexibility if some Proposed Projects cannot be implemented due to environmental review, HUD eligibility, technical feasibility, or other factors. Implementation of the projects and actions found in this NYRCR Plan are subject to applicable Federal, State, and local laws and regulations, including the Americans with Disabilities Act (ADA). Inclusion of a project or action in this NYRCR Plan does not guarantee that a particular project or action will be eligible for

CDBG-DR funding or that it will be implemented. The Governor's Office of Storm Recovery will actively seek to match projects with funding sources.

In the months and years to follow, many of the projects and actions outlined in this NYRCR Plan will become a reality helping New York not only to rebuild, but also to build back better.

March 2014

## NYRCR Communities<sup>2</sup>



*Find out more at*  
[www.stormrecovery.ny.gov/nyrcr](http://www.stormrecovery.ny.gov/nyrcr)

<sup>2</sup> Map includes those NYRCR Communities funded through the CDBG-DR program, including the NYRCR Communities announced in January 2014

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# Executive Summary

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The geographic scope of the NY Rising Community Reconstruction (NYRCR) Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach Plan encompasses the Village of Atlantic Beach and the unincorporated hamlets of Atlantic Beach Estates and East Atlantic Beach, which are all in southwestern Nassau County, NY. The geographic scope is referred to as the “Community,” and the NYRCR Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach Plan is referred to the “NYRCR Community Plan.”

The Community is on the western end of Long Beach Barrier Island, off the south shore of Long Island. Reynolds Channel is to the north, the City of Long Beach is to the east, and the Atlantic Ocean is to the south and west. The Village of Atlantic Beach covers one square mile; Atlantic Beach Estates, which is part of East Atlantic Beach, covers 0.9 square mile; and the remainder of East Atlantic Beach covers 0.6 square mile. The Village of Atlantic Beach is an independent, incorporated village; East Atlantic Beach and Atlantic Beach Estates are under the jurisdiction of the Town of Hempstead.

Collectively, the Community is eligible for up to \$9.0 million in U.S. Department of Housing and Urban Development Community Block Grant – Disaster Recovery (CDBG-DR) funding to implement the proposed actions (Proposed Projects, Featured Projects, and Additional Resiliency Recommendations) that are described in this NYRCR Community Plan. Of the total amount, the Village of Atlantic Beach is eligible for up to \$3.0 million, and East Atlantic Beach and Atlantic Beach Estates are together eligible for up to \$6.0 million.

## Superstorm Sandy Impacts

Much of the Community was inundated by Superstorm Sandy in 2012, including oceanfront beach clubs and nearly the entire the bayside area (north of Park and Beech Streets). An estimated 1,003 of the approximately 1,900 housing units in the Community sustained damage, with 684 suffering at least 50% damage.

The storm also damaged key infrastructure assets and systems, including roads, electrical systems, drainage systems, government facilities, bulkheads, and dunes. The Atlantic Beach Rescue dock and pilings and the Village of Atlantic Beach Tennis Center were damaged. The Atlantic Beach Village Hall and Water Reclamation Plant were kept operational during and after Superstorm Sandy, though only through extraordinary provisional measures. Many of these assets had already been subjected to repetitive damage and loss during previous storm events, including Hurricane Irene, because of low elevations and inadequate mitigation and hardening.

The projects and actions described in this NYRCR Community Plan are necessary to continue the Community’s recovery from the extensive damage inflicted by Superstorm Sandy and to improve resiliency against future disaster events.

## Critical Issues

The NYRCR Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach Planning Committee (Committee) identified three types of critical issues that must be addressed to improve the Community’s resiliency and mitigate future risks related to storms and flooding: key infrastructure, other key assets, and hazard mitigation.

Key infrastructure, including public utilities and significant buildings, must be hardened to withstand damage. Although future storm and flooding events are inevitable, relocation or protection of key systems can improve continuity of operations for emergency services, minimize or prevent disruption of health and human services to vulnerable populations, and minimize or prevent disruption of business operations. Other key assets, which include the oceanfront beach clubs that provide the Community’s economic base, must be protected. Finally, the Committee recognized that the mitigation of hazards through improved and increased services and regional coordination is a major need.



## Working Together to Rebuild Stronger, Smarter, and Safer

Early in the development of the NYRCR Community Plan, the Committee used a consensus-based approach to develop a Vision Statement that reflects the Community's goals for the future of the Community. The Vision Statement reflects an allegiance to the history and traditional character of the Community and recognition that the Community must identify proactive, innovative solutions to ensure long-term resiliency.

### Public Outreach

The Committee presented the Vision Statement to Community residents at a Public Engagement Event on October 16, 2013, the first of the three Public Engagement Events to date. A fourth Public Engagement Event is planned. Attendees expressed strong support for the Vision Statement and agreed that it appropriately reflects the Community's character and aspirations.

Extensive outreach was conducted through online and in-person opportunities throughout the planning process to ensure broad public participation and awareness of this planning opportunity.

Committee Meetings were open to the public, and comment cards were available for attendees to provide input and to submit contact information to receive updates. The Committee responded to written questions from attendees during group discussions.

Participants at Public Engagement Events received exit surveys and comment cards and were asked for feedback and email addresses so they could be informed about upcoming meetings and other Public Engagement Events.

#### **NYRCR Atlantic Beach/East Atlantic Beach/ Atlantic Beach Estates Vision Statement**

We are committed to protecting our natural assets and beach community by strengthening our infrastructure and shoreline along the Barrier Island to reduce the likelihood of threats to the health and safety of our residents in the event of future storms.

The Committee used a variety of outreach methods to maximize participation at the first three Public Engagement Events. The methods were electronic and social media, email, flyers, 25 lawn signs throughout the Community, 500 door hangers, and notices printed by local media outlets. With the Committee's assistance, 4,500 flyers and/or custom letters were mailed or emailed to Community residents and organizations.

Committee Meetings and Public Engagement Events were also announced on the NYRCR website and Facebook page, both of which also served as sources for information, documents, and answers to questions about the NYRCR Community Plan.

Outreach materials were also distributed to the Committee, whose members are active in local groups, including school boards, civic associations, and sports leagues. Committee members distributed these materials to local organizations, friends, family, neighbors, and colleagues. In total, more than 4,500 flyers were delivered to Committee members, displayed at public gathering places, or distributed to local organizations and businesses in the Community and in the adjacent City of Long Beach.

As a result of the extensive outreach effort, a total of 260 Community residents attended the first three Public Engagement Events.

### Blueprint for Implementation

In the early stages of the planning process, the Committee identified six strategies to reduce the Community's exposure to risk from flooding during high tide and storm events, enable the Community to rebuild smarter and stronger, and support residents and businesses by protecting the Community's considerable assets. The Committee then developed a list of proposed actions to implement the strategies.

The actions are divided into three categories: Proposed Projects, Featured Projects, and Additional Resiliency Recommendations. All categories are important to the Community. The categories are defined as follows:

- **Proposed Projects:** Projects designed to be fully funded through the NYRCR Program using the Community's allocation of CDBG-DR funds.
- **Featured Projects:** Innovative projects and actions that the Planning Committee has identified as important resiliency recommendations and

has analyzed in depth, but has not proposed for funding through the NYRCR Program.

- **Additional Resiliency Recommendations:** Additional Resiliency Recommendations are projects and actions that the Planning Committee would like to highlight and that are not categorized as Proposed Projects or Featured Projects.

Table ES-1 provides a list of strategies and the associated Proposed and Featured Projects. Additional Resiliency Recommendations are located in Section V, Table V-1. The strategies and project are not listed in order of importance, rank, or priority.

**Table ES-1: Table of Proposed and Featured Projects**

Strategy	Project Name	Project Category	Cost	Project Category
<b>Protect critical Infrastructure to create community resiliency and sustainability to ensure continuing services needed before, during, and after disasters</b>	<b>Harden Water Reclamation Plant</b> – Provide resiliency to the existing Water Reclamation Plant and three pump stations to maintain functionality during rain and hazard events.	Proposed	\$720K	Infrastructure
	<b>Emergency Medical Services</b> – Protect and fortify the existing Atlantic Beach Rescue Building through improved infrastructure and communication systems.	Proposed	\$460K	Infrastructure
	<b>Complete Streets/Drainage along Beech Street</b> – Use Complete Streets to provide phased drainage and street improvements along emergency evacuation routes through stormwater best management practices, infrastructure improvements, and traffic safety and management measures.	Proposed	\$5.5M	Infrastructure
	<b>Solar-Powered Street Lights</b> – Provide light-emitting diode (LED) street lighting that is solar powered to prevent loss of lighting in the event of power outages.	Proposed	\$1.3M	Infrastructure
	<b>Install Backflow Preventers</b> – Install backflow preventers and storm drain covers throughout the Community to mitigate flooding and prevent debris from entering drains.	Proposed	\$360K	Infrastructure
	<b>Microgrid Power System</b> – Conduct a feasibility study and implement a power microgrid system throughout the Community.	Featured	\$19.2M	Infrastructure
	<b>Underground Utilities Feasibility Study</b> – Conduct a feasibility study to determine the potential for underground utilities in areas, specifically East Atlantic Beach, that are at risk of flooding.	Featured	\$100K	Infrastructure
	<b>Stormwater System Improvements</b> – Study adaption of existing open spaces for floodwater catch basins.	Featured	\$10K	Infrastructure



**Table ES-1 (Continued)**

Strategy	Project Name	Project Category	Cost	Project Category
<p><b>Increase the Community’s capacity to facilitate and foster actions that lead to greater resiliency, emergency preparedness, and sustainability</b></p>	<p><b>Village of Atlantic Beach Community Assistance Center</b> – Retrofit the Tennis Center in the Village of Atlantic Beach to be used as a Community Assistance Center, including improvements to drainage and the incorporation of active and passive recreational elements.</p>	Proposed	\$2M	Community Planning and Capacity Building
	<p><b>East Atlantic Beach Community Assistance Center Feasibility Study</b> – Evaluate and identify a location for a Community Assistance Center in East Atlantic Beach and Atlantic Beach Estates.</p>	Proposed	\$50K	Community Planning and Capacity Building
	<p><b>Atlantic Beach Village Hall</b> – Provide upgrades and protection to Atlantic Beach Village Hall to maintain continuity of operations and protect vital records during and after storm events.</p>	Proposed	\$400K	Community Planning and Capacity Building
	<p><b>Emergency Preparedness Guidebook</b> – Draft and disseminate an emergency preparedness guidebook in coordination with Nassau County, Town of Hempstead, and the City of Long Beach for distribution to all residents.</p>	Featured	\$100K	Community Planning and Capacity Building
<p><b>Implement measures to make the Community’s economic drivers more resilient</b></p>	<p><b>Assess Feasibility and Economic Impact of Perimeter Dune System</b> – Study the cost-effectiveness and technical feasibility of a dune perimeter system on the beach clubs including benefits and risks.</p>	Proposed	\$500K	Economic Development
	<p><b>Cell Phone Tower Resiliency</b> – Improve cell phone tower resiliency during emergencies.</p>	Featured	\$1.6M	Economic Development
<p><b>Protect critical Community health and social services assets and increase the capacity to provide needed emergency and community services before, during, and after disasters</b></p>	<p><b>Emergency Preparedness Guidebook</b> – Draft and disseminate an emergency preparedness guidebook in coordination with Nassau County, Town of Hempstead, and the City of Long Beach for distribution to all residents.</p>	Featured	\$100K	Health and Social Services
<p><b>Encourage and facilitate housing resiliency and sustainability measures throughout the Community</b></p>	<p><b>Emergency Preparedness Guidebook</b> – Draft and disseminate an emergency preparedness guidebook in coordination with Nassau County, the Town of Hempstead, and the City of Long Beach for distribution to all residents.</p>	Featured	\$100K	Housing
	<p><b>Identification of Vulnerable and Special-Needs Populations</b> – Identify vulnerable and special-needs populations through a special-needs registration.</p>	Featured	\$8K	Housing



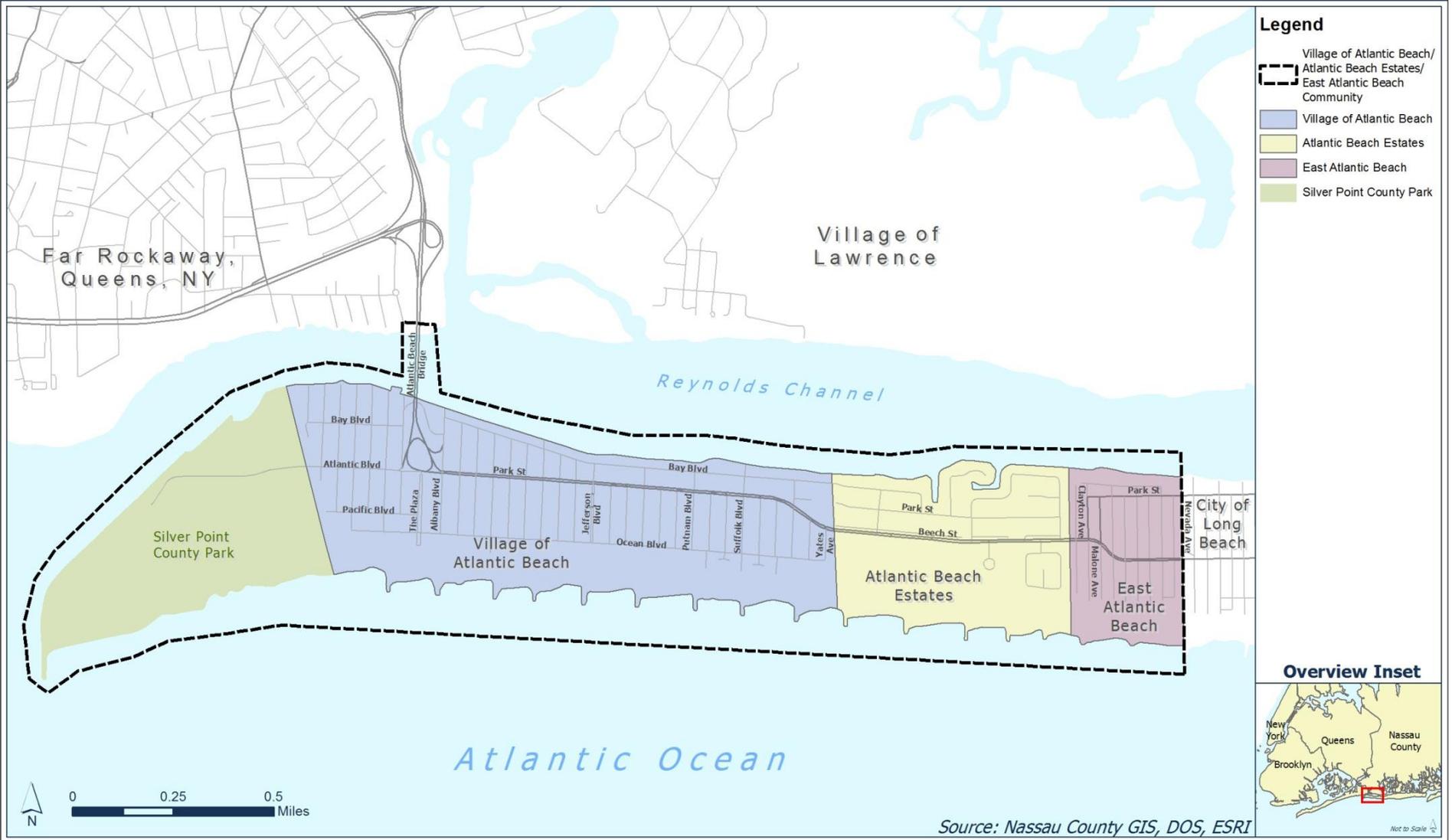
**Table ES-1 (Continued)**

Strategy	Project Name	Project Category	Cost	Project Category
<b>Restore and enhance natural resources for both resiliency and recreation purposes while also protecting important cultural resources</b>	<b>Assess Feasibility and Economic Impact of Perimeter Dune System –</b> Study the cost-effectiveness and technical feasibility of a dune perimeter system on the beach clubs including benefits and risks.	Featured	\$500K	Natural and Cultural Resources
	<b>Stormwater System Improvements –</b> Study adaption of existing open spaces for floodwater catch basins.	Featured	\$10K	Natural and Cultural Resources



# Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach

Figure ES-1: Geographic Scope





# Section I: Community Overview

# Section I: Community Overview

## A. Introduction

The State of New York (State) has developed the NY Rising Community Reconstruction (NYRCR) Program, an innovative post-disaster planning process, to help recovering communities rebuild better, safer, and more resilient.

The NYRCR Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach Planning Committee (Committee) is composed of community representatives partnered with planning experts from the New York Department of State and Governor's Office of Storm Recovery. The Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach are referred to collectively in this document as the NYRCR Community (see Figure I-1). The Committee used a community-based planning process to develop an NYRCR Community Plan that addresses the need to repair existing damage and mitigate future threats to create a safer and more resilient community. The Committee has focused on developing the NYRCR Community Plan in coordination with the State team through Committee Meetings every 2 weeks, Public Engagement Events, and meetings with stakeholder representatives.

## B. Geographic Scope of the NYRCR Plan

The geographic scope of the NYRCR Community Plan encompasses the Village of Atlantic Beach (Village) and the unincorporated hamlets of Atlantic Beach Estates and East Atlantic Beach, which are all located in southwestern Nassau County, NY. The Community is on the western end of Long Beach Barrier Island (Barrier Island), which is off the south shore of Long Island. Reynolds Channel is to the north, the City of Long Beach is to the east, and the Atlantic Ocean is to the south and west. The Village of Atlantic Beach covers one square mile; Atlantic Beach Estates, which is part of East Atlantic Beach, covers 0.9 square mile; and the remainder of East Atlantic Beach covers 0.6 square mile. The Village of Atlantic Beach is an independent,

incorporated village; East Atlantic Beach and Atlantic Beach Estates are under the jurisdiction of the Town of Hempstead (Town). The Committee identified the geographic scope (see Figure I-1) based on municipal boundaries, the extent of the Superstorm Sandy and Hurricane Irene storm surges, and other flooded or damaged areas.

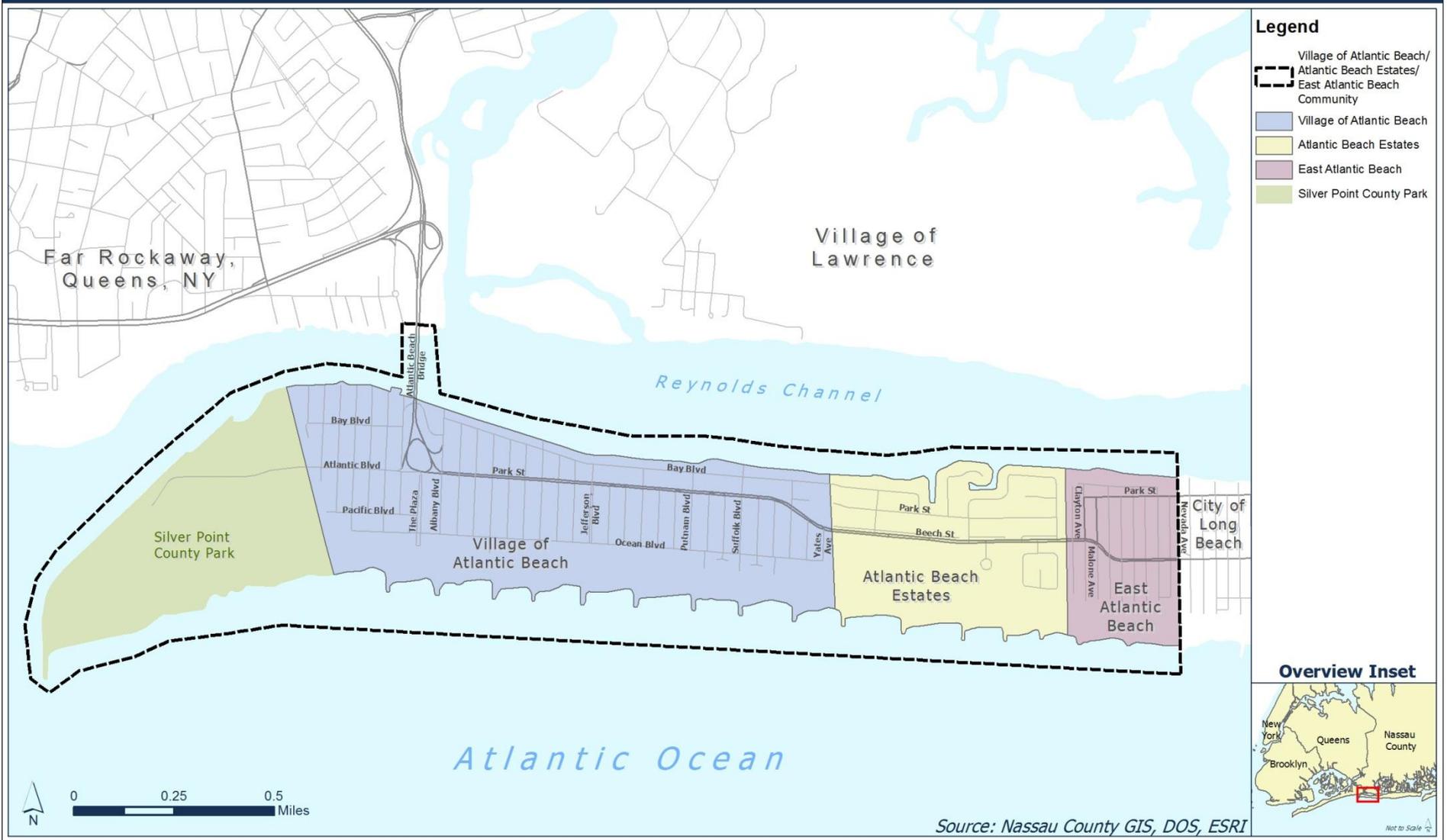
Three road bridges provide access to the Barrier Island. One of them is the Atlantic Beach Bridge (New York State Route 878), a toll bridge that provides access from the Village of Atlantic Beach to the Village of Lawrence, NY, on the mainland of Long Island and Queens County and the rest of New York City. The two other bridges are in the City of Long Beach and the hamlet of Point Lookout, which are both east of the Community.



**Genesee Dune, Village of Atlantic Beach**  
Source: Kate Murray, Town of Hempstead Supervisor

# Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach

Figure I-1: Geographic Scope



The Community is almost exclusively residential, with limited commercial uses along Park Street and The Plaza in the Village of Atlantic Beach and Beech Street in East Atlantic Beach. The Community also has a seasonal economic anchor—14 oceanfront beach clubs that occupy a large portion of the Community’s Atlantic Coast.<sup>1</sup> The Community now comprise a thriving beach community whose population increases during the summer with an influx of seasonal residents from New York City and nearby Long Island towns who are drawn to these waterfront amenities.

Most Community housing consists of detached single-family housing with front, side, and rear yards. Nearly 70% of the Community’s housing stock was constructed prior to 1960, with many units dating back to the 1920s when the Community was developed. These development patterns contribute to the Community’s historical character, but the age of the housing also implies a high degree of risk.

Most housing structures in the Community were built before the Community adopted National Flood Insurance Program requirements and before Flood Insurance Rate Maps. As a result, many were constructed at elevations below the base flood elevation (BFE), making them vulnerable to flooding. Additionally, homes constructed before 1980 were based on BFEs that did not account for wave action, making them vulnerable to surge damage.

This risk profile is magnified by the historical geomorphological characteristics of the Community. The Village of Atlantic Beach was



**Sun & Surf Beach Club, Village of Atlantic Beach**  
Source: Creative Common Flickr

developed in the early 1920s when a local banker financed the dredging of tons of sand from Reynolds Channel to be piled onto what was then a “shifting sand bar.”<sup>2</sup> Between 1835 and 1990, the Barrier Island and the inlet system evolved to its present configuration. The shoreline change, which has historically ranged from as erosive as -23 ft/yr at the eastern end of the Barrier Island to as accretive as +51.0 ft/yr in the western end (following the construction of the East Rockaway Inlet jetty), indicates the great potential for sediment movement that exists along the entire Barrier Island shore. Stabilization efforts, namely construction of inlet jetties, groin fields, and seawalls, as well as periodic beach fill, have reduced the observed rates of accretion and erosion along the Barrier Island, except in the area just west of Point Lookout, where erosion rates remain high in spite of human efforts.<sup>3</sup>

Structural protective measures, including bulkheads and dunes, have been constructed in some areas, mitigating some risk associated with flooding and erosion. Nonetheless, the Community’s exposure to risk is magnified by its original construction and lack of a protective dune system, meaning that key facilities and infrastructure systems have substantial hazard-related vulnerability.

The demographic profile of the Village and the two hamlets is fairly typical of many other seasonal beach communities in the City of New York metropolitan area. The community is generally affluent and well educated, though not all residents are affluent and well educated. The Community also contains a wide range of socially vulnerable populations who may require special considerations in the planning process.

More than half of Community residents have a bachelor’s degree or higher, and nearly 70% of adults 16 and over are in the active labor force.<sup>4</sup> Most workers commute to nearby economic centers because the Community provides only 567 private-sector and 45 public-sector jobs.<sup>5</sup> The commuters tend to work in highly skilled positions such as management, business, science, and the arts.<sup>6</sup> Of the residents who are eligible for the labor force, 97.7% are employed.<sup>7</sup>

The median household income in the Community of \$110,268 is considerably higher than the Nassau County median income of \$81,300.<sup>8</sup> Although the Community is generally affluent, 10% of all households have annual incomes of \$24,999 or less.<sup>9</sup> The lower income residents may be particularly

vulnerable to residential displacement or significant financial hardship in post-disaster settings.

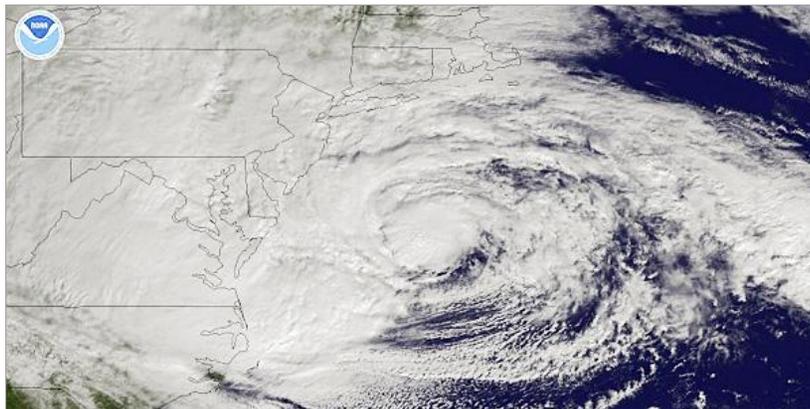
According to the Federal Government's generally accepted definition of housing affordability, the housing costs of 24% of homeowners with mortgages and 39% of renters in the Community exceed housing affordability. Housing unaffordability is potentially an issue for approximately 280 households in the Community.<sup>10</sup>

Additional vulnerable populations in the Community are individuals with disabilities, senior citizens, and civilian veterans. In 2012, there were 181 civilian veterans in the Community and 249 people with a disability. More than half of the disabled population was 65 or older.<sup>11</sup> Approximately 20% of the population was also 65 or older.

### C. Description of Storm Damage

Superstorm Sandy struck New York on October 29, 2012, causing a peak storm tide elevation of 17.48 feet in Long Beach, and bringing storm surge flooding of three to six feet above ground level across the Barrier Island<sup>12</sup>. It was the largest storm in New York's recorded history to land ashore.

Superstorm Sandy was the second major coastal storm to hit the area in just over a year. On August 28, 2011, Hurricane Irene made landfall in New York



**Superstorm Sandy Centered off Maryland and Virginia, October 29, 2012**

Source: NOAA

as a tropical storm, with sustained wind speeds of approximately 63 mph. Storm surge of nearly 4.5 feet was recorded at nearby locations in Point Lookout and East Rockaway, and flooding was exacerbated by approximately five inches of rainfall.<sup>13</sup> Inundated areas included the beach along the Atlantic Ocean and the bayside along Reynolds Channel (north of Park Street). The storm also caused hundreds of millions of dollars in property damage in New York City and Long Island.

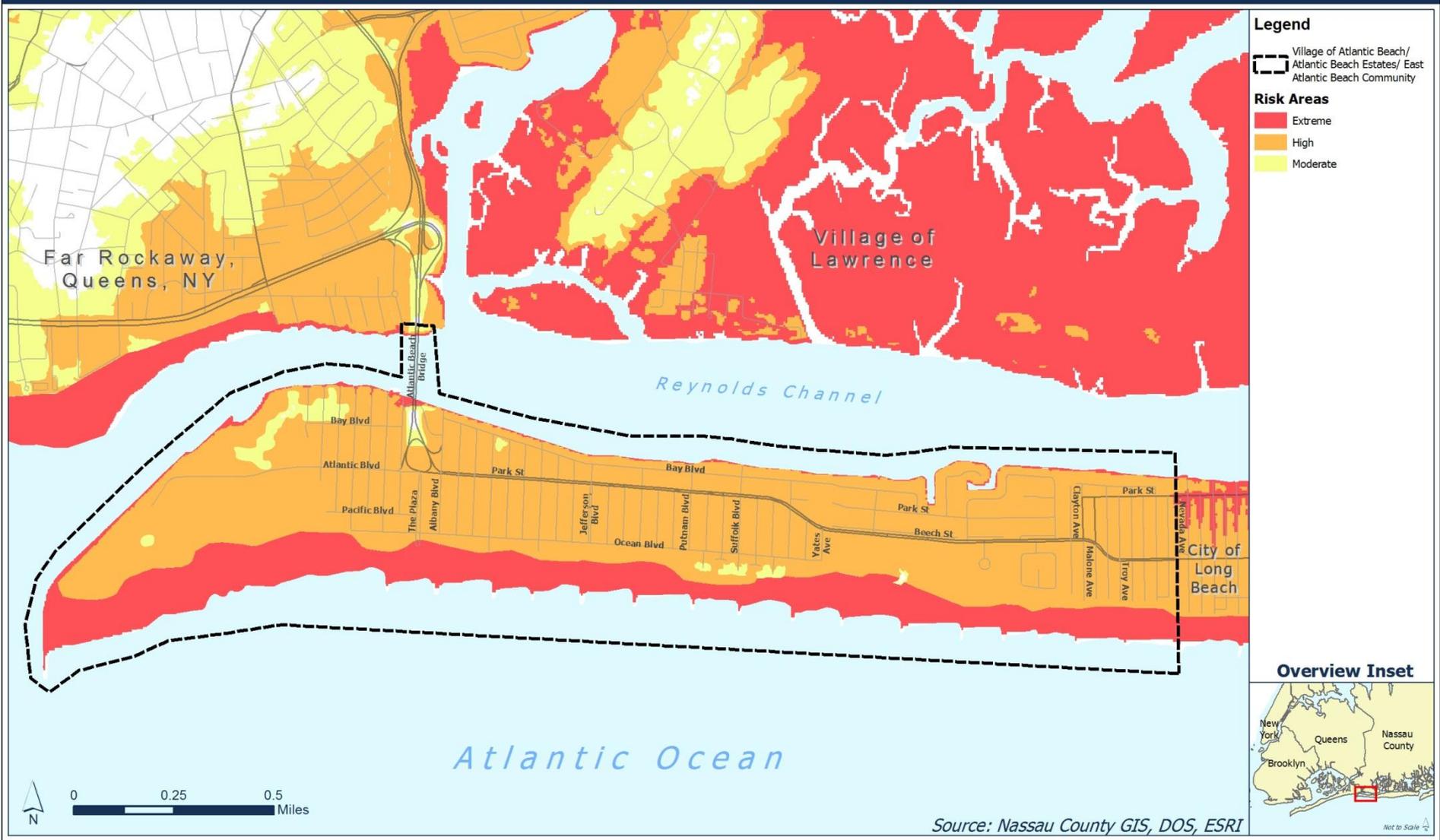
Tropical-storm-force winds along with heavy rains resulted in 10 deaths statewide. Flooding and saltwater incursion also caused power outages for 1.1 million residents across much of Long Island that lasted up to one week. In total, Hurricane Irene caused more than \$1.3 billion in statewide damage.<sup>14</sup> Though Irene caused localized flood damage in Nassau County and inconvenienced many residents, its impact on the Community was relatively minor, especially compared to Superstorm Sandy. The Federal Emergency Management Agency (FEMA) estimated countywide damage necessitating Public Assistance Program funding at approximately \$5.5 million, as compared to approximately \$250 million in Manhattan.<sup>15</sup>

Superstorm Sandy was a more devastating storm than Hurricane Irene, both locally and across much of New York State. Superstorm Sandy caused widespread damage to lives, homes, businesses, core infrastructure, government property, and an economy beginning to recover from a financial crisis. The storm caused 53 fatalities,<sup>16</sup> destroyed an estimated 305,000 homes,<sup>17</sup> affected more than 2,000 miles of roads, produced catastrophic flooding in subways and tunnels, and damaged major power transmission systems. Fourteen counties in New York were declared Federal disaster areas.<sup>18</sup> Economic losses in New York as a result of Superstorm Sandy were estimated to be between \$30 and \$50 billion, with an estimated \$10 to \$20 billion in insured losses.<sup>19</sup> New York State Governor Andrew M. Cuomo stated that storm damage would cost New York State nearly \$42 billion, with the vast majority of damage centered on the City of New York and Long Island.<sup>20</sup>

In anticipation of severe flooding from Superstorm Sandy, Nassau County Executive Ed Mangano issued a mandatory evacuation order, effective at 5:00 PM on October 28, 2012. Perhaps recalling Irene's relatively restrained impact, many Community residents opted to shelter in place. Sandy flooded almost the entire Community, including nearly the entire bayside area (north of Park and Beech Streets) and the western portion of the Village of Atlantic

# Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach

Figure I-2: Risk Areas



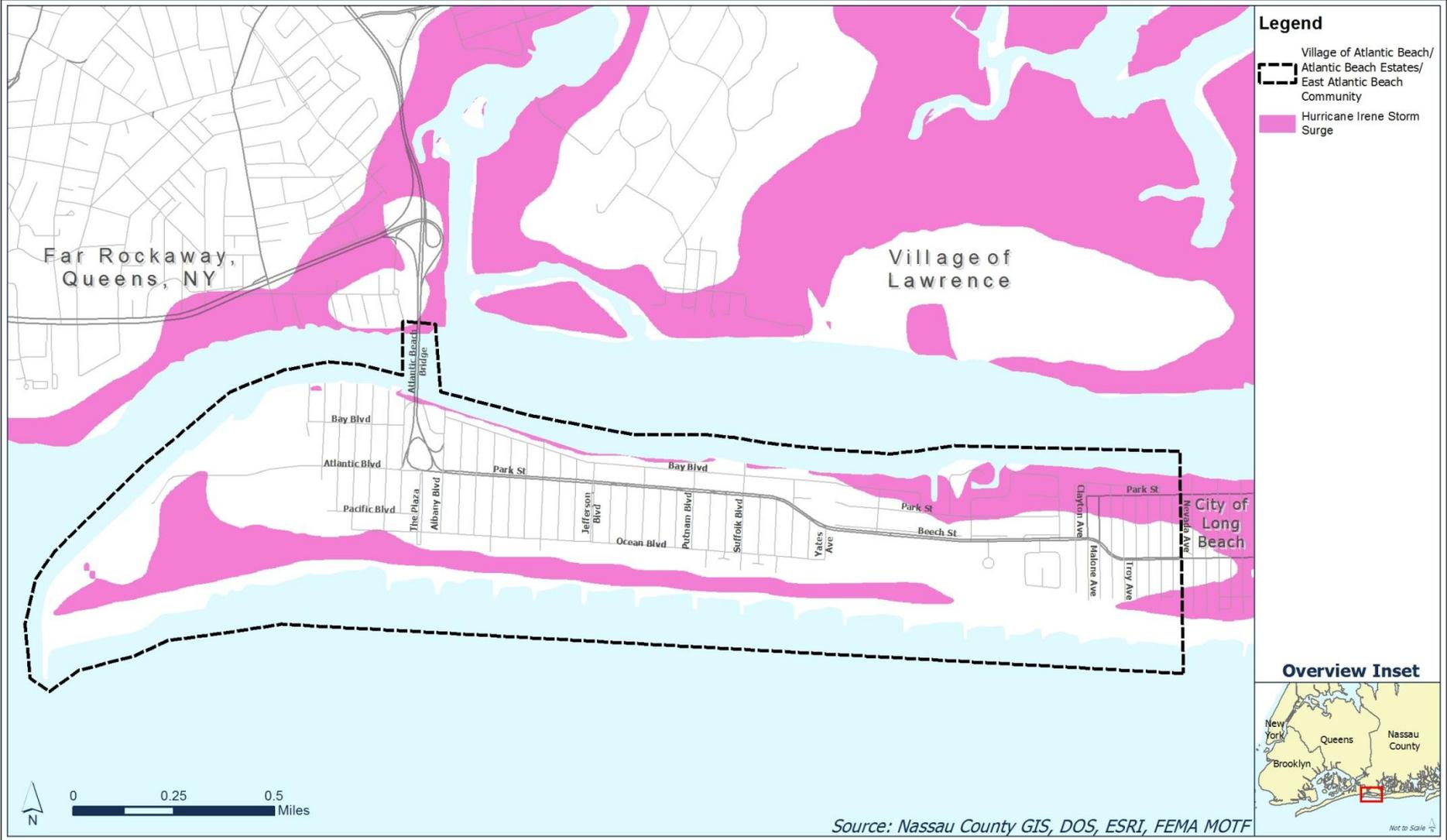
# Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach

Figure I-3: Superstorm Sandy Storm Surge Extent



# Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach

Figure I-4: Hurricane Irene Storm Surge Extent



Beach. A water stage recorder near the Atlantic Beach Bridge recorded water levels in excess of the 100-year BFE for several hours during the afternoon and evening of October 29. On the oceanside, water levels reached as high as three feet above street level on Ocean Boulevard and six inches above street level as far inland as Beech Street in East Atlantic Beach.

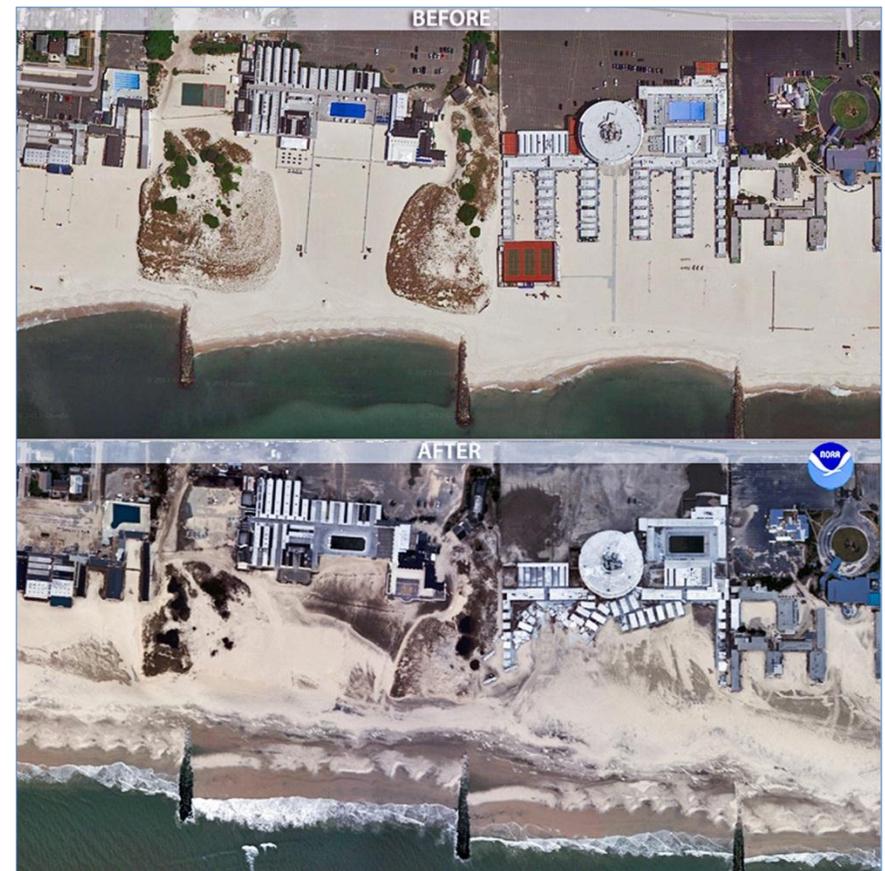
In the Community, oceanfront business and facilities, including the boardwalk and most of the 14 private beach clubs, incurred heavy damage. The damage included the loss of cabanas and cabana decks and the flooding of and damage to the beach club buildings.

Many club owners were able to secure loans, make renovations, and reopen in time for the 2013 summer season but at a significant cost. Several beach clubs, including the Ocean Club and the Sands Atlantic Beach Club, replaced the old wooden pilings with reinforced concrete pilings that raised the new structure above the flood level. They also installed hurricane clips and straps to fortify the decks where new cabanas were built.

Approximately 1,000 of the 1,900 housing units in the Community suffered some level of damage, mostly all from direct flooding.<sup>21</sup> As of June 2013, approximately 944 homeowners in the Community had registered for assistance with FEMA, with a total estimated damage of more than \$8 million. More than 684 homes across the Community suffered more than 50% damage. Flood damage affected 961 units, and 75 residences had more than four feet of water.<sup>22</sup>

The storm damaged key infrastructure including roads, electrical systems, drainage systems, government facilities, bulkheads, and dunes. The Atlantic Beach Rescue dock and pilings and the Village of Atlantic Beach Tennis Center were damaged. The Atlantic Beach Village Hall and Water Reclamation Plant were both protected by extraordinary measures. Although saltwater incursion caused the failure of the power lines feeding the plant, both the plant and its substations remained operational during and after the storm thanks to the extensive and prolonged use of temporary generators. Atlantic Beach Village Hall served as a Community Assistance Center after the storm and provided services and information to Community residents.

Many of these key assets had already been subject to repetitive damage and loss during normal storm events because of low elevations and inadequate mitigation and hardening.



Storm damage as a result of Superstorm Sandy, East Atlantic Beach  
Source: NOAA

Storm surge and strong winds caused extensive damage to Long Island Power Authority (LIPA) infrastructure, leading to power outages for nearly all LIPA customers in Nassau County. Because of the Community's geographic location and its vulnerability to both wind and surge damage, outages were prolonged and extensive. In addition to damages caused by saltwater incursion, damage also occurred when winds caused trees and broken limbs to fall into overhead electric distribution circuits and power lines. Up to two weeks after the storm, roughly 7% of Nassau County customers, including

many Community residents, remained without power, according to the Governor's Office of Storm Recovery.

Power was not restored to the Community until weeks after the storm because the Long Island Power Authority (LIPA) determined that the Barrier Island could not safely receive power before major repairs were completed. FEMA deployed a Mitigation Assessment Team (MAT) to New Jersey and New York to investigate building performance during the storm event. The MAT reached the following conclusions:<sup>23</sup>



**Storm damage as a result of Superstorm Sandy, Village of Atlantic Beach**  
Source: Building Plans Examiner

**Buildings:** Foundations that met current State building standards (codes that mandate elevating buildings above the BFE) withstood flooding as a result of Superstorm Sandy. In East Atlantic Beach, homes that were constructed in accordance with current State building standards and codes remained intact while most other houses were damaged by floodwaters. Buildings below the flood level sustained damage as a result of inundation, hydrodynamic forces, waves, or floating debris loads. Many buildings affected by flooding had damage to basements with finishes, contents, and mechanical, electrical, and plumbing systems.

**Dunes:** The presence of wide beaches and tall, intact dune systems in some areas of East Atlantic Beach and Atlantic Beach Estates reduced damage to buildings and infrastructure landward of the dunes; conversely, low and narrow beaches and dunes were eroded in many areas, and buildings and

infrastructure landward of areas with fragmented low or absent dunes were damaged by waves and inundation.

**Erosion control structures:** The effectiveness of erosion-control structures, including bulkheads, seawalls, and revetments, which exist on the bayside of the Community, varied widely depending on the height, age, and condition of the structures. Some buildings within 10 to 20 feet of erosion-control structures that were parallel to the shore were overtopped by floodwaters and damaged by floodwater and/or erosion, even when the erosion-control structures survived.

## D. Critical Issues

The Village of Atlantic Beach, Atlantic Beach Estates, and East Atlantic Beach are all located in extreme or high risk areas for flooding and other impacts from potential future storms. Hardening key infrastructure, protecting community assets, and establishing hazard mitigation efforts are critical themes to address for the Community.

Issues of primary concern for the Community during and after Superstorm Sandy are as follows:

- **Hardening key infrastructure:** Hardening key infrastructure, including public utilities and significant buildings, to help prevent or minimize damage from future storms is necessary because much of the key infrastructure is located in extreme or high risk areas. Potential actions include relocating and/or installing emergency generators, developing a power microgrid, and fortifying key critical facilities. These actions would improve continuity of operations for emergency services, minimize or prevent disruption of health and human services to vulnerable populations, and minimize or prevent disruption of business operations.
- **Securing community assets:** Official, governmental records and operations must be protected during a disaster in order for the government to serve the public. Increased support for the oceanfront/coastal perimeter dunes and existing beach clubs is critical for both key economic and community-wide assets.
- **Implementing hazard mitigation:** Hazard mitigation is needed to improve community resiliency. Improving underground drainage for stormwater runoff, clearing blocked sewers, and upgrading drainage and

stormwater infrastructure were all identified as critical issues and seen as ways to reduce flooding in the Community. Providing emergency medical services and establishing Community Assistance Centers for potential future hazard events were primary concerns expressed by the Committee and the public at Committee Meetings and Public Engagement Events. The Committee also identified improved planning and emergency preparedness and response coordination between the Community and the Town of Hempstead and Nassau County as a key objective.

Since Superstorm Sandy, the Community has undertaken the following actions to help make the Community more resilient:

- The Greater Atlantic Beach Water Reclamation District has applied for a FEMA hazard mitigation grant for emergency power generation
- The Village repaired its Putnam and Vernon chair houses and built new concrete block chair houses at The Plaza and Dutchess beaches
- The Village of Atlantic Beach repaired and rebuilt the Boardwalk and the Plaza ramp in the Village of Atlantic Beach
- The Village of Atlantic Beach replaced/repared damaged street lighting and missing street signs
- The Village of Atlantic Beach replaced damaged sidewalks and repaired roadways within
- The Village of Atlantic Beach replaced fencing at beach entrances and bulkheads

## E. Community Vision

A Vision Statement was developed using a consensus-based approach at the Committee Meetings and at Public Engagement Events. Key words were identified and presented to the public along with the Vision Statement at a Public Engagement Event on October 16, 2013 (see Figure I-5). Attendees at the Public Engagement Event expressed strong support for the Vision Statement



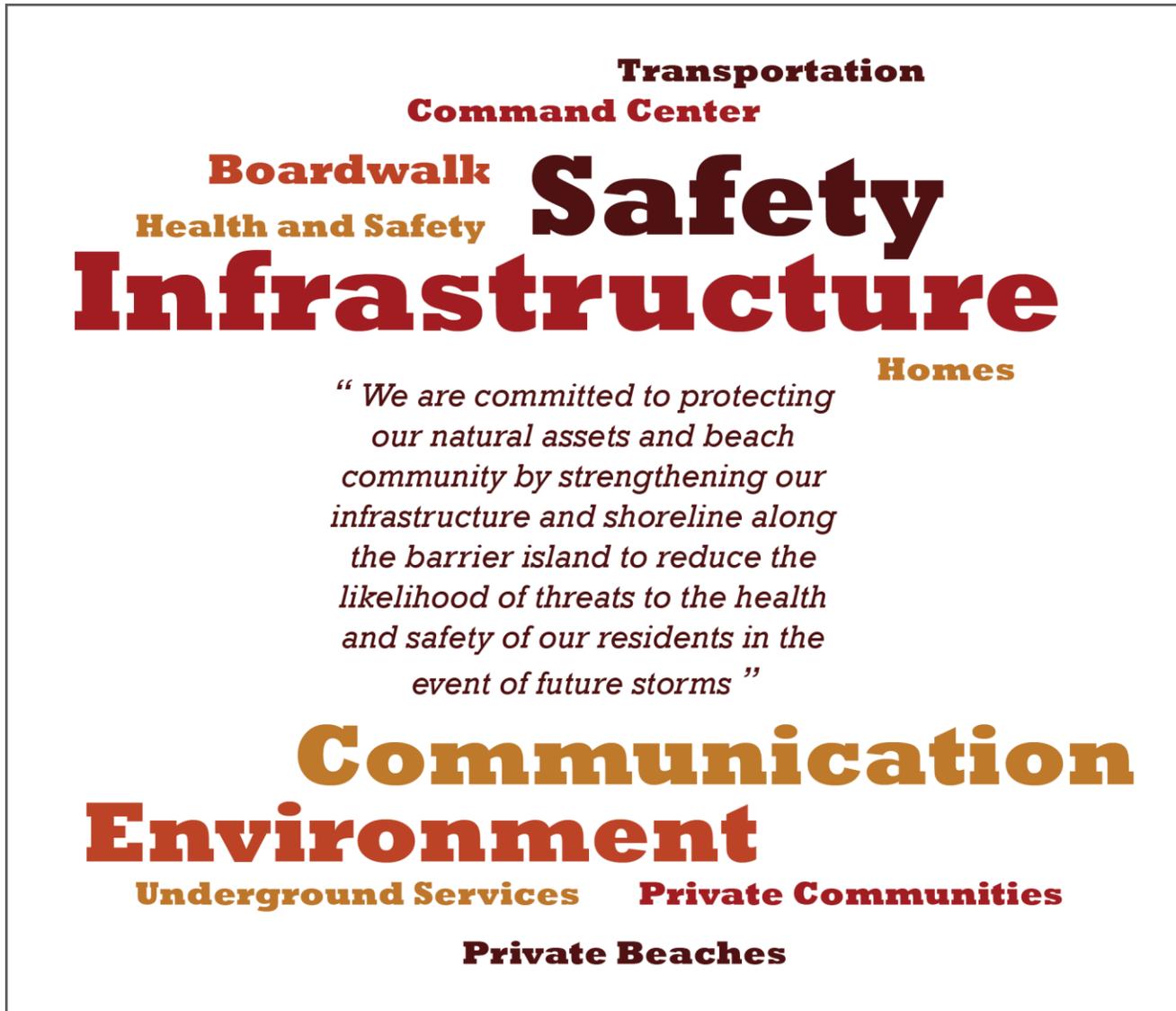


Figure I-5: Vision Statement and Word Cloud

## F. Relationship of the NYRCR Community Plan to Regional Plans

Local and regional planning documents were reviewed for information relevant to the three communities. The documents included the Town of Hempstead Building Zone Ordinance<sup>24</sup> (1939, as amended) and the Code of the Village of Atlantic Beach<sup>25</sup> (1998). Documents with a regional focus included pre- and post-Sandy documents and information on local projects in the Community in various stages of planning and execution.

Many of the recommendations in this NYRCR Community Plan align with the strategies set forth in the regional plans described below. Strategies and implementation actions for the Community are detailed in Section III.

### Long Island South Shore Estuary Reserve: Comprehensive Management Plan (2001)<sup>26</sup>

The vision of the *Long Island South Shore Estuary Reserve: Comprehensive Management Plan* (CMP) is to preserve, protect, and restore the ecosystem of the Long Island South Shore Estuary Reserve. The primary goals of the plan are to reduce nonpoint and point-source pollution, improve the estuarine health of the bay, restore and protect coastal habitats, and increase open space preservation.

The Committee has ratified a list of Proposed and Featured Projects, many of which will have indirect environmental benefits that align with the objectives of the Plan. For example, structural hardening of the Water Reclamation Plant would limit or eliminate discharge of raw or partially treated sewage into Reynolds Channel during storm events. The project would therefore contribute to estuarine health, while promoting public use of water resources.

### Nassau County Hazard Mitigation Plan (2007)<sup>27</sup>

The *Nassau County Hazard Mitigation Plan* (HMP) contains historical data on hazard impacts to the communities, long-term erosion projections and flood zones, and hazard mitigation opportunities through capital improvements. The HMP identifies drainage improvements that could be made to the Park Street corridor to limit inundation and ponding during and after storm events. The Committee has included a similar project to improve drainage along Beech Street in East Atlantic Beach that can be linked to Complete Streets in the City

of Long Beach, and is on the list of Proposed Projects (see Complete Streets/Drainage Improvements along Beech Street in Section IV.A).

### Sustainable Strategies for Long Island 2035 (2010)<sup>28</sup>

*Sustainable Strategies for Long Island 2035* provides policies and strategies to help communities prepare for economic, social, and environmental changing. Recommendations include developing a climate change resilience plan that addresses sea level rise, coordinating emergency preparedness across jurisdictions, and revising building codes for East Atlantic Beach to promote flood protection and provide guidance on replacing structures lost as a result of coastal erosion.

The Committee has incorporated several recommendations and prescriptions in the Proposed and Featured Projects related to Community Planning and Capacity Building. The Committee strongly supports cross-jurisdictional preparedness planning to mitigate some of the response and capacity issues that were observed in the aftermath of Sandy.

### Strong Island – The Story of a Region’s Recovery and Resurgence: The Strategic Economic Development Plan for Nassau and Suffolk Counties (2013)<sup>29</sup>

*Strong Island – The Story of a Region’s Recovery and Resurgence: The Strategic Economic Development Plan for Nassau and Suffolk Counties* was developed by The Long Island Regional Economic Development Council (LIREDC). The 2013 update addresses economic development in the region including critical issues post-Superstorm Sandy. The Community is in the LIREDC jurisdiction.

### Cleaner Greener Long Island Regional Sustainability Plan (2013)<sup>30</sup>

The *Cleaner Greener Long Island Regional Sustainability Plan* includes regional priorities that are relevant to the NYRCR planning process. Key regional priorities are:

- Advancing Superstorm Sandy recovery and rebuilding by providing incentives for greener and more resilient developments, encouraging relocation locally outside the floodplain, and encouraging rapid restoration of the electric grid. The Community is considering several greener and more resilient infrastructure projects.

- Improving energy efficiency. The Community is encouraging solar power as an alternative energy source.
- Improving transportation options. The Community is proposing a Complete Streets project to improve transportation.
- Increasing the development of green infrastructure to control flooding and decrease pollution from stormwater runoff. The Community is proposing projects to implement green infrastructure and improve stormwater drainage.
- Encouraging regional coordination of sustainability planning and its implementation.

The 2013 *Cleaner Greener Long Island Regional Sustainability Plan* also recommends strategies to address climate change, such as updating comprehensive plans to address sea level rise, flooding, and storm surges; updating building codes; adopting protection and mitigation measures to protect infrastructure; and updating emergency management plans. The Community is proposing mitigation measures to protect key facilities as part of the NYRCR planning process.

### Regional Perspectives

Mitigating the risk of damage from future storms to increase resiliency will require both regional and local actions in addition to implementing the elements in the regional plans described above. The Village of Atlantic Beach is an incorporated village in Nassau County, and the unincorporated areas of Atlantic Beach Estates and East Atlantic Beach are part of the Town of Hempstead. East Atlantic Beach had to rely on assistance from the Village of Atlantic Beach after Superstorm Sandy. The Community has expressed a strong interest in coordinating emergency services and planning and in creating Community Assistance Centers to serve the Town and Village needs. Section IV Implementation – Project Profiles includes projects the Community has identified as fulfilling these needs.

The Community has meaningful opportunities to collaborate with neighboring municipalities and jurisdictions to develop projects and coordinate resources. As part of the planning process, Governor Cuomo activated State Agency Review Teams (SARTs) to review Proposed Projects. The purpose of the review was to identify potential regulatory or eligibility issues and also to

identify instances in which multiple Committees were responding to similar issues and challenges. The SARTs offered useful input on issues discussed in this NYRCR Community Plan that cross political jurisdictions and could be coordinated on a regional basis. It is also important for the Community to address the greater region and to consider the entire Barrier Island, Nassau County, and greater Long Island.

Neighboring municipalities and communities on the Barrier Island include the City of Long Beach, Lido Beach, and Point Lookout, which are part of the Town of Hempstead. The Village of Lawrence and the hamlet of Inwood, also under the jurisdiction of the Town of Hempstead, are located across Reynolds Channel to the north, as is the Queens neighborhood of Far Rockaway. All of these communities participated in the NYRCR planning process.

Coordination with these communities may help provide an economy of scale to obtain needed resources for larger efforts such as implementing regional storm barrier projects, improving established evacuation routes, making Complete Streets and stormwater improvements, and establishing microgrids to help deal with common issues such as the need for bulkheading, emergency services, transportation connectivity, and potential alternative power generation. Intergovernmental disaster response agreements with these communities may be beneficial to all.

Coordination with Nassau County and other communities would be beneficial in developing green stormwater infrastructure, such as permeable pavement, bioswales, rain gardens, and gray water reclamation. In addition, Nassau County and the Town of Hempstead can coordinate on restoring marsh and wetland areas already affected by storms. Recreational opportunities such as bicycle and pedestrian facilities along major transportation corridors offer additional opportunities to increase public recreational opportunities.



**Silver Point County Park, Atlantic Beach**  
Source: LiRO

Power and natural gas are supplied to the Community by substations and a pipeline that is located (and originates) outside the Community. Coordination with National Grid and the Public Service Electric and Gas Company (PSEG), which manages the Long Island Power Authority’s electric system, is necessary to secure backup power sources and protect transmission and distribution facilities that are vulnerable.

A need for improvements to communication systems also warrants regional coordination. The Community is proposing improvements to communications for emergency management, the Nassau County Office of Emergency Management, and cell tower resiliency.

On December 5, 2013, representatives from four of Nassau County’s NY Rising Communities—Atlantic Beach, Long Beach, Lido Beach, and Oceanside—held a workshop to discuss regional issues. The issues included coastal protection for the bayside and the oceanfront, stormwater management, green infrastructure, Complete Streets, water/wastewater, and microgrid systems. The purpose of the workshop was to provide an educational context for the Nassau County NYRCRs to discuss the benefits and applicability of resiliency and protective measures and to provide examples of models that have worked well in other areas.

An iterative engagement process with these stakeholders is underway and will build on the goals and vision articulated in this NYRCR Community Plan.



## **Section II: Assessment of Risk and Needs**

## Section II: Assessment of Risk and Needs

A Community Asset Inventory was developed for the NY Rising Community Reconstruction (NYRCCR) Community (Community), which comprises the Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach. The Community Asset Inventory includes Community assets and asset systems.

A Community asset is defined as a facility within or outside the Community that is crucial to emergency response functions following natural disasters and that if impaired as a result of hazard events, would compromise the essential social, economic, or environmental functions of the Community. Assets include shelters, critical facilities such as police stations and health facilities, and vital infrastructure assets.

An asset system is defined as a system within or outside the Community that if impaired as a result of flooding, would affect Community assets or functions. Examples of asset systems are transportation services, telecommunications, and water supply.

The Community Asset Inventory is provided in Section V.D. The locations of the assets in the Community Asset Inventory are shown in Figure II-1.

The potential impact of hazards on the assets in the Community Asset Inventory was assessed by performing a risk analysis based on current conditions, goals, and strategies. The purpose of the risk assessment was to investigate potential flood impacts to Community functions and develop a baseline understanding of flood risk that could be used to evaluate management options. The analysis helped the Community document methods of mitigating risks.

### A. Community Asset Inventory

The development of the Community Asset Inventory was based on an iterative process that included input from the NYRCCR Planning Committee (Committee), Public Engagement Events, and local and State officials. The process combined the relevant knowledge of local and State officials and technical support provided by the Consultant Team. The public reviewed the Community Asset Inventory at a Public Engagement Event on October 16, 2013.

Site visits were conducted of the following key facilities and critical infrastructure in September 2013 and again in February and March 2014: Atlantic Beach Rescue Building and Dock, Water Reclamation Plant, Tennis Center, the Atlantic Beach Village Hall, Town of Hempstead Beach Club, and the newly constructed chair houses used by the Village of Atlantic Beach (Village) residents to store beach chairs in the summer. The Community's roadway network was also toured, which included driving the Beech Street corridor and Atlantic Beach Bridge.

The Committee finalized the Community Asset Inventory based on input and feedback from the public. As a part of the development of the inventory, the assets were classified according to four of the six Recovery Support Functions. The six Recovery Support Functions are as follows:

#### The Six Recovery Support Functions

**Community Planning and Capacity Building:** How the community will restore or enhance its ability to organize, plan, manage, and implement its recovery.

**Economic Development:** How the community will restore economic and business activities and develop new economic opportunities.

**Health and Social Services:** How the community will restore and improve essential health and social services, including for vulnerable populations.

**Housing:** How the community will meet the demand for affordable housing (and promotion of affordable housing), address post-disaster housing needs, and encourage disaster-resistant housing for all income groups.

**Infrastructure:** How the community will restore, repair, and manage essential infrastructure services.

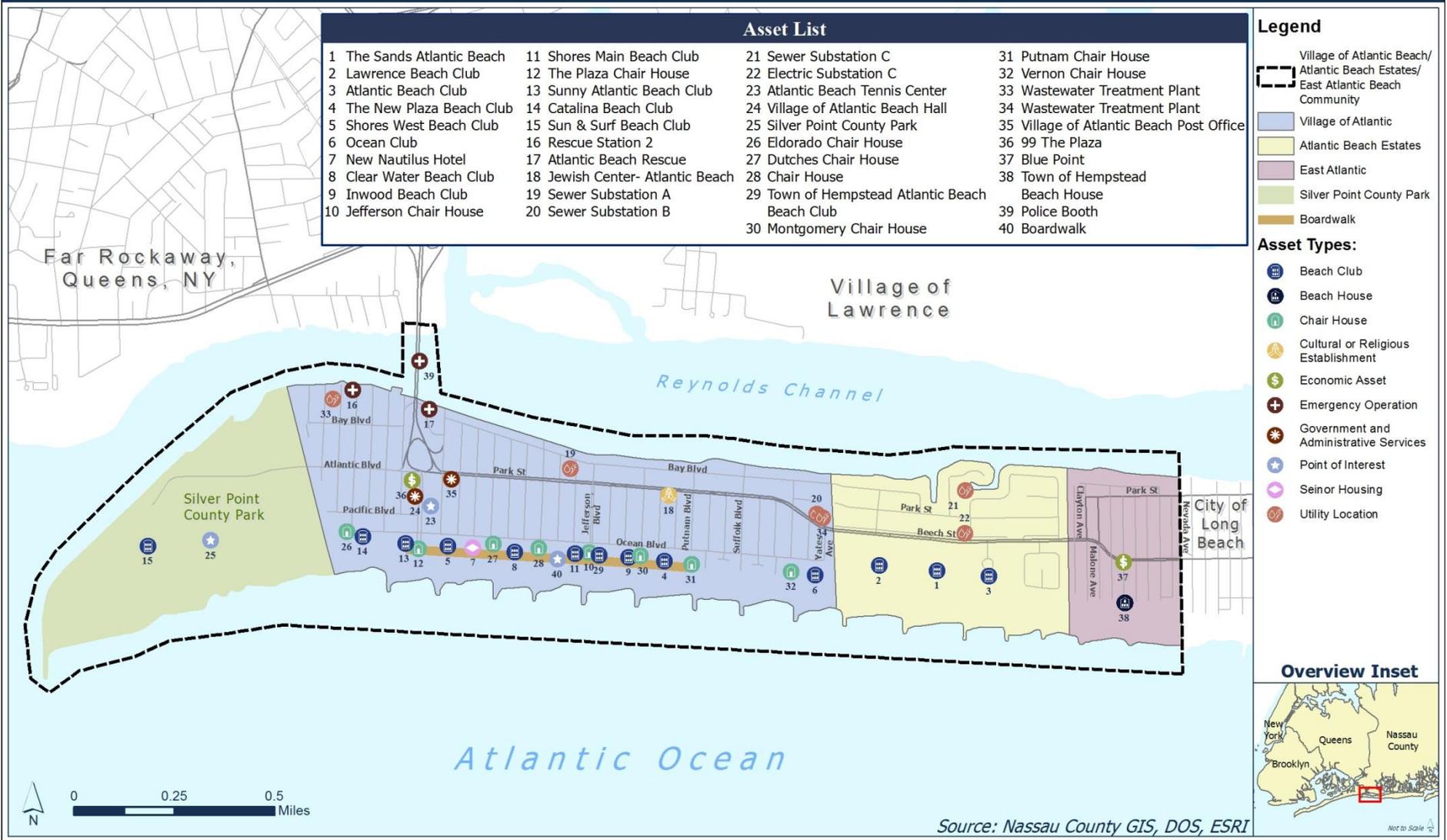
**Natural and Cultural Resources:** How the community will approach natural and cultural resource management from a risk reduction and economic development context.

Source: *Guidance for New York Rising Community Reconstruction Plans: A Planning Toolkit for CR Planning Committees*



# Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach

Figure II-1: Asset Inventory





**Catalina Beach Club on Ocean Blvd., Village of Atlantic Beach**  
Source: Creative Community Flickr

The assets in the Community Asset Inventory were categorized according to the Recovery Support Functions of Economic Development, Health and Social Services, Infrastructure, and Natural and Cultural Resources. A summary of the assets in each Recovery Support Function is as follows:

- **Economic Development:** The Community’s economy is driven by beach clubs and recreational facilities that encompass more than 40% of the land in the area and provide significant seasonal employment opportunities.<sup>31</sup> The operating assets in the Community include 14 private beach clubs along Ocean Boulevard and a public beach club at Silver Point County Park, which all front the Atlantic Ocean. The beach clubs are a major source of non-residential property tax revenue to the Community, and they remain particularly vulnerable to storm surge and natural hazards.

Superstorm Sandy had a severe impact on local businesses. Small Business Administration (SBA) data show that business losses of SBA loan applicants amounted to approximately \$4 million in the Community, but total SBA-approved loans covered only 63% of the losses.

- **Health and Social Services:** The four assets in this category are the Village of Atlantic Beach Post Office, Atlantic Beach Rescue building, the Atlantic Beach Village Hall, and the Police Booth. The Atlantic Beach Village Hall functioned as the Community Assistance Center during Superstorm Sandy, helping to ensure delivery of critical services. The other assets provide emergency services and other essential services that the public depends on in post-emergency situations.

- **Infrastructure:** The infrastructure assets in the Community are an electric substation, three sewer substations, and two wastewater treatment plants. Each facility provides services on which residents and businesses in the Community depend. Operation and functionality of the utilities are critical to the health and well-being of the Community at all times.
- **Natural and Cultural Resources:** Eleven natural and cultural resources assets in the Community were identified. The assets are the approximately 1-mile-long Boardwalk, which extends between The Plaza and Putnam Boulevard in the Village; several chair houses; and the Atlantic Beach Tennis Center. The Tennis Center currently functions as a recreational facility. The Boardwalk and beaches are Community gathering places that provide residential access to the ocean.

When the list of assets was finalized, the Committee developed detailed information about each asset, which included landscape attributes in the vicinity of the asset and vulnerability of the asset to flood damage. The assets were then assigned a high, medium, or low priority based on factors such as probability of being affected by flooding, capacity to return to service after a storm, and time needed for recovery. Assets that had limited interruption of the delivery of core community services were assigned a low vulnerability index.



**Oceanfront at Sun & Surf Beach Club, Village of Atlantic Beach**  
Source: Creative Community Flickr

**Assessment of Risk to Assets**

The New York State Department of State (NYS DOS) risk areas defined in Table II-1 were used to evaluate risk to assets in the Community. The Risk Assessment Map (see Figure II-2) shows that nearly all of the Community is in an extreme or high risk flooding area. Moderate risk areas are limited and include a small area in the northwestern corner of the Village of Atlantic Beach and several small areas directly behind the discontinuous dunes in East Atlantic Beach and Atlantic Beach Estates.

A risk assessment to determine the potential impact of hazards on community assets was conducted. The results helped guide the selection of proposed strategies, such as infrastructure improvements and changes in the building environment. The risk assessment helped the Community choose mitigation options to reduce future risk. Input from the Committee and extensive input from the public on areas with the highest risk of flooding were used to supplement the Risk Assessment Map (Figure II-2).

**Risk Assessment Methods**

NYS DOS developed a risk assessment tool to quantify risk to community assets. The three factors that were used to assess risk were hazards, exposure, and vulnerability. Hazard scores were provided by the NYRCR

Program based on a standard storm scenario: the chance that a 1% annual risk storm (100-year flood event) would occur during a 100-year planning time frame. Exposure scores were calculated as an expression of the local topographic and shoreline conditions that tend to increase or decrease the effects of coastal hazards on assets. The mapped risk areas also contributed to the exposure scores because assets experience flood hazards more frequently and with greater impact depending on their geographic location.

Landscape attributes were used to calculate a total landscape attribute score, which included the following characteristics:

- Erosion rate  $\geq 1$  foot per year or unknown
- Waterline frequently at shore defense or upland vegetation
- Shore defenses absent, not constructed to anticipated conditions
- Protective vegetation between asset and flood source absent
- Dunes absent, below base flood elevation (BFE), eroding, little vegetation; bluff slope unstable, little vegetation
- Asset on coastal barrier island or filled wetland

**Table II-1: New York State Department of State Risk Areas**

Extreme Risk Area	High Risk Area	Moderate Risk Area
<ul style="list-style-type: none"> <li>• FEMA Coastal V Zones</li> <li>• NWS advisory thresholds for shallow coastal flooding</li> <li>• Areas within three feet of elevation of mean higher high water shoreline from the National Oceanic and Atmospheric Administration</li> <li>• Areas prone to erosion</li> </ul>	<ul style="list-style-type: none"> <li>• FEMA 1% annual (100-year) flood risk (FEMA Zone V and Zone A)</li> <li>• Areas within three feet elevation of NWS advisory thresholds for shallow coastal flooding</li> </ul>	<ul style="list-style-type: none"> <li>• FEMA 0.2% annual (500-year) flood risk</li> <li>• Areas within three feet of elevation of FEMA 1% annual flood risk (base flood elevations)</li> <li>• Area bounded by SLOSH Category 3 hurricane inundation zone</li> </ul>

Source: New York State Department of State  
FEMA = Federal Emergency Management Agency

NWS = National Weather Service  
SLOSH = Sea, Lake, and Overland Surge from Hurricanes



# Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach

Figure II-2: Risk Assessment



Vulnerability scores are an expression of the capacity of an asset to return to service after a storm. Assets that can quickly recover or that experience limited interruption to their delivery of core community services were assigned a low vulnerability index.

The Risk Assessment Tool calculates a risk score using the following formula:

**Hazard score x Exposure score x Vulnerability score = Risk score**

The risk score represents the risk of Community assets relative to one another. An asset whose total risk score is severe typically has very high hazard, exposure, and/or vulnerability scores. In a barrier island community like this one, which has limited natural and structural protection from storm surge and flooding, most variability in risk scores is the function of differences in observed outage time. In other words, the vulnerability score tends to be the greatest contributor to variability in total risk score across all Community assets

See the Table V-4 in Section V.D. for detailed hazard, exposure, vulnerability, and risk scores.

### Risk Assessment Results

The assets in the Community Asset Inventory were assessed for risk, and risk scores were calculated for each asset using the Risk Assessment Tool. Figure II-3 shows the results of the risk assessment. See Section V.D for additional information about the Community Asset Inventory and risk assessment of the assets.

The risk scores of the assets in the Community range from relatively low scores in the case of beach clubs that were spared major damage to extreme scores in the case of exposed beachfront assets that were rendered unusable for several weeks or months following the storm. The assets with the highest risk scores include the chair houses and beach clubs along the Atlantic Beach coastline, which are within an extreme risk area and are more vulnerable than the other assets. Their location in an extreme risk area and proximity to storm surge make them particularly vulnerable.

Assets with lower risk scores, such as the Water Reclamation Plant, remained functional during Superstorm Sandy and were spared damage because of extraordinary measures that were taken. The Atlantic Beach Village Hall is a good example of an asset whose total risk score is perhaps artificially low

because of a combination of good luck and diligent storm preparation. The Atlantic Beach Village Hall avoided major damage thanks to extensive sandbagging prior to Sandy, although outbuildings on the property flooded. Similarly, the Community's sewer substations, which are located in high and extreme risk areas, were kept operational during Superstorm Sandy by sandbagging.

Provisional measures such as sandbagging are not an optimal means of mitigating long-term risk, however. Sandbagging a facility is time-consuming and diverts energy from other vital storm preparation activities. It is also not a failsafe method of mitigating damage: there was significant evidence after the storm that sandbagging failed to protect other Community assets, including homes, from the storm surge and flooding.

### Assessment of Risk to Systems

The assessment of risk to systems highlights the initial risk assessment results for system asset groups (i.e., infrastructure, public services) that do not lend themselves to assessment as individual point assets. The risk assessment methods and risk assessment results described in the previous subsection were used to determine the risk score of systems. Results are shown in Section V-D.

**Economic Development:** All 14 beach clubs, including the public Sun & Surf Beach Club in Silver Point County Park, are located in Zone VE on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps. These assets are therefore vulnerable not only to storm surge but also storm-influenced velocity wave action. According to local residents and Committee members, all of the beach clubs were at least partially damaged by Superstorm Sandy. The clubs also all experienced at least minor flooding during Hurricane Irene. Six beach clubs sustained major damage during Superstorm Sandy including the Shores West, New Plaza, Sunny Atlantic, Clearwater, Ocean Club, and Atlantic Beach Club. As with all other assets located in VE Zones, these clubs cannot be rebuilt to pre-storm conditions because substantially damaged facilities would need to be elevated above the BFE. In the case of the beach clubs' cabanas, elevation would be expensive and impractical, according to club owners.

As noted previously, the Village of Atlantic Beach lacks dunes and other forms of beachfront natural or manmade protection. Not surprisingly, many

of the Village's beach clubs, including Clearwater, Sunny Atlantic, New Plaza, and the Sands, sustained the longest outage times post-Sandy.

**Health and Social Services:** During Superstorm Sandy, the Atlantic Beach Village Hall's governmental records were at risk of flood damage. The records were not damaged because of extraordinary efforts to protect the building, including sandbagging. The Community's emergency service assets received some of the lowest risk scores in the Community because of the manner in which the Risk Assessment Tool calculates risk. In a barrier island community with limited natural and structural protection from storm surge and flooding, most variability in risk scores is a function of differences in observed outage time. Critical assets such as Atlantic Beach Village Hall, the Rescue Squad building, and the Water Reclamation Plant were spared significant damage only because of extensive and time-consuming efforts by staff prior to the storm. These measures protected the assets during Sandy but cannot be relied on in the future to mitigate risk as effectively. These assets are all still vulnerable to storm surge, wave, and wind action.

**Infrastructure:** Infrastructure assets in the Community include an electric substation, three sewer substations, and two wastewater treatment plants. During Superstorm Sandy, these facilities were subjected to bayside surges. Maintaining power to these facilities during an emergency is critical to continuity of operations.

**Natural and Cultural Resources:** Protecting natural and cultural assets is critical to protecting the heritage of the Community. During Superstorm Sandy, the Boardwalk and many of the chair houses sustained significant damage or were completely destroyed. Several of the chair houses that store resident beach chairs received high risk assessment scores, mainly as a result of their location and lack of protection.

## B. Assessment of Needs and Opportunities

The needs and opportunities for the Community were identified during Committee Meetings and Public Engagement Events and through an online survey. Consensus building was used to identify capacity and reconstruction needs and opportunities that address resilience to potential future storm events. The needs and opportunities were identified on a non-prioritized

basis and will be addressed using the strategies, projects, programs, and actions described in Section III.

The needs and opportunities that were identified are related to the six Recovery Support Functions: Community Planning and Capacity Building, Economic Development, Housing, Health and Social Services, Infrastructure, and Natural and Cultural Resources.

## Community Planning and Capacity Building

### Community Planning and Capacity Building Needs

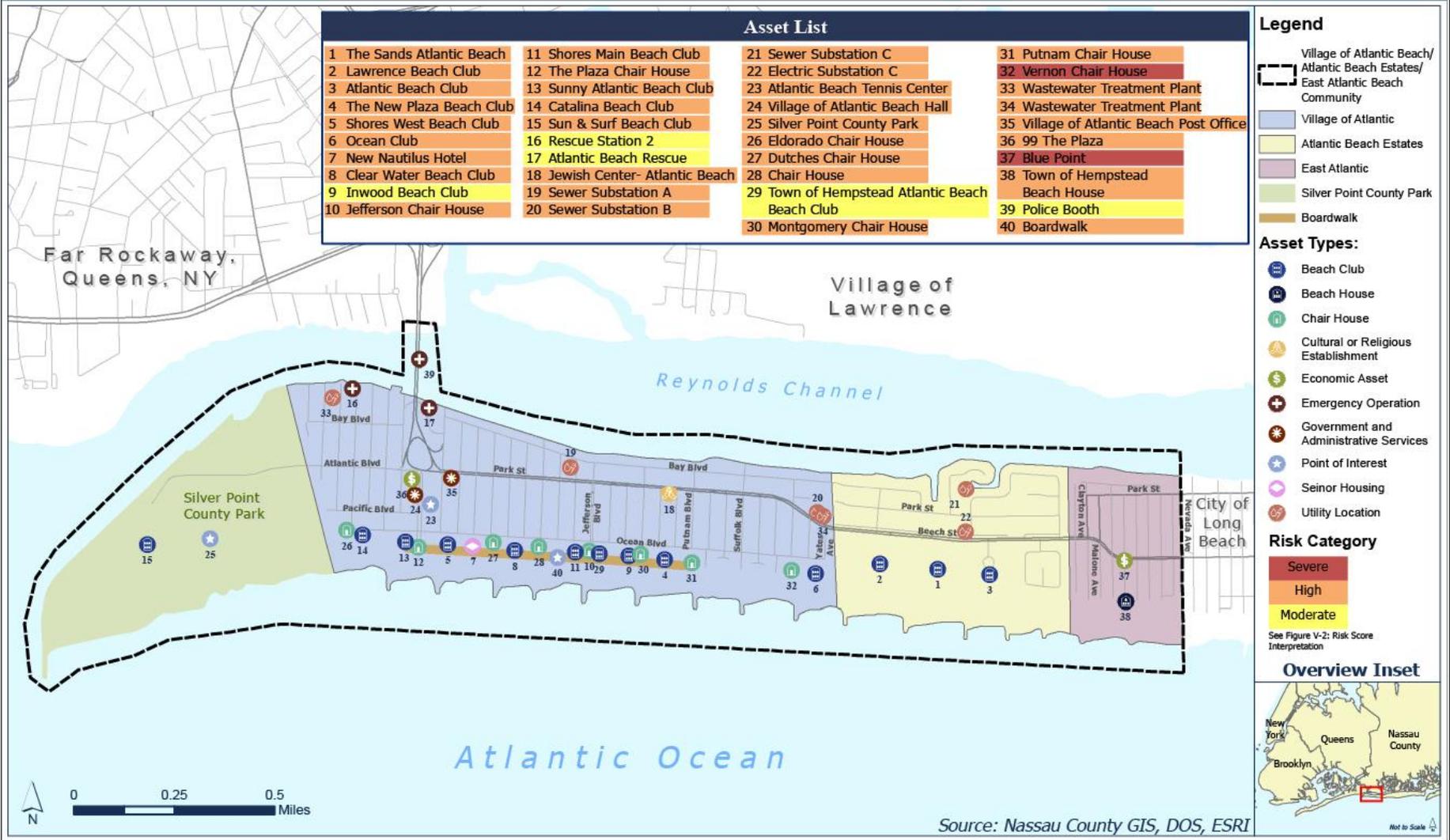
As described above, the Village of Atlantic Beach Hall was protected by extensive measures to prevent flooding and protect governmental records that were vulnerable to flood damage. During and after Superstorm Sandy, the building served as the primary Community Assistance Center for dissemination of information and provision of basic services. The Atlantic Beach Village Hall was used as a staging center for operations by the Indiana Incident Management Assistance Team, which assisted the Village of Atlantic Beach with emergency relief efforts after Superstorm Sandy. Because it was not designed to serve this function, the Atlantic Beach Village Hall did not meet the Community's capacity need.

The Village of Atlantic Beach was also asked to provide services to East Atlantic Beach and Atlantic Beach Estates residents. These requests put further strain on emergency provisions. In addition, power outages and other utility failures compromised the Village's ability to coordinate regional needs and simultaneously provide vital communication and emergency assistance to residents and constituents after the storm.

Coordination and communication between the Town of Hempstead and East Atlantic Beach were limited during and after the storm, according to hamlet residents. Residents attributed the lack of physical presence and relevant information from Town personnel to the hamlet's relative isolation on the Long Beach Barrier Island (Barrier Island) and its location between the incorporated Village of Atlantic Beach and City of Long Beach. Community members had limited or no access to the Town of Hempstead and sought assistance from the Village of Atlantic Beach, which already had severe capacity limitations.

# Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach

Figure II-3: Risk Assessment Scores





**View of Atlantic Beach Rescue Dock, Atlantic Beach Bridge**  
Source: LiRo

The Community has expressed a greater need for regional planning coordination that would yield increased emergency services such as fire rescue and medical services in post-disaster settings. The Committee discussed the need for coordination with representatives of Nassau County and the Town of Hempstead.

The insufficiency of local emergency preparedness capacity also impeded response efforts that were already complicated by the unreliability of key services, including electricity and cell service. Many residents who sheltered in place or who returned to their homes after the storm encountered sustained cell phone or Internet outages. The lack of reliability of the local communications network was not only inconvenient but potentially dangerous in the days immediately after Superstorm Sandy. The Community expressed a strong need for bolstered power supply during storm events to ensure that communication and power supplies are maintained.

### **Community Planning and Capacity Opportunities**

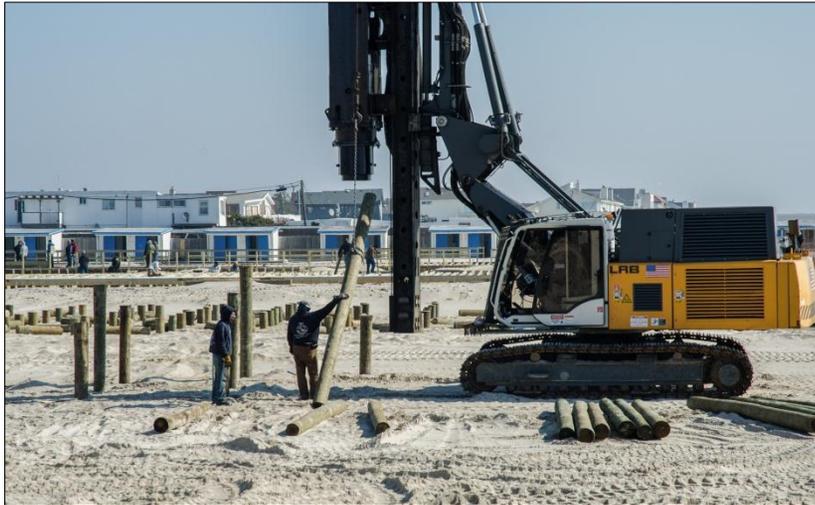
The opportunities to establish Community Assistance Centers and emergency preparedness protocols through local and regional coordination may be accomplished by:

- Protecting key governmental facilities so that they can maintain continuity of operations after major storms.
- Addressing the need for Community Assistance Centers to coordinate emergency management activities and information after storms.
- Coordinating regional planning, emergency management, and zoning code updates between the Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach, the Town of Hempstead, and Nassau County to make the communities more resilient. Community interest in improving coordination is high.
- Designating a trained coordinator for emergencies to increase communication opportunities and serve as a liaison between the communities and surrounding municipalities.
- Identifying funding and technical assistance opportunities, such as the Local Government Records Management Improvement Fund Shared Services grant program, to update and improve recordkeeping protection.
- Updating the existing zoning and building codes in the Incorporated Village of Atlantic Beach and the Town of Hempstead to address community resiliency and comprehensive planning strategies. Coordinating local zoning code amendments with the Town of Hempstead and the Village of Atlantic Beach to promote regional planning approaches, including adopting best practices related to stormwater management, land use, and hazard mitigation.

## **Economic Development**

### **Economic Development Needs**

Local economic activity is mostly confined to the beach clubs and other recreational facilities, which generate significant revenues during the summer. The estimated 80 businesses in the Community, which includes the beach clubs, supply more than 500 primary jobs. Other local businesses are focused primarily on supporting these assets, the tourists they attract, and serving the specialized retail, financial, and commercial needs of local residents. On Park Street in the Village of Atlantic Beach, these businesses include a local deli and specialty surf shop.



**Reconstruction of the Sands Beach Club Cabanas, which were lost during Superstorm Sandy**

Source: FEMA / Kenneth Wilsey

The beach clubs remain vulnerable to storm surge and velocity wave action because of their location in Zone VE on FEMA Flood Insurance Rate Maps. Beach club owners have historically resisted the idea of new dune construction, which would mitigate this risk. The owners fear the impact of the barriers on viewsheds, beach access, and beach enjoyment and say that dune construction would destroy the financial viability of the clubs. Consequently, the clubs act as seawalls in many locations, taking the brunt of storm surge, and for this reason, all of the clubs sustained damage caused by the ocean storm surge during Superstorm Sandy and some damage during Hurricane Irene. Many beach club owners had to pay out-of-pocket expenses for repairs.

Opportunities for new commercial development are circumscribed by zoning and the existing density of the built environment. Currently, the marine recreation zoning of the beach club areas does not permit any other non-residential or residential use, expansion, or redevelopment. Land use and zoning in the Community is focused on residential uses (see Figure II-4). Only a limited number of parcels are zoned for business use, with oceanfront parcels zoned primarily for marine recreation. Most of the parcels are

currently used as beach clubs (see Figure II-3). In addition, the Village of Atlantic Beach and East Atlantic Beach do not have economic development plans that could help foster continuity of economic advancements across the Community.

### **Economic Development Opportunities**

The opportunities to advance the economic viability of the Community through beach club and streetscape improvements may be accomplished by:

- Encouraging and helping beach clubs and small businesses prepare business continuity plans for power outages and other emergencies.
- Improving the access, streetscapes, and parking areas surrounding the beach clubs.
- Implementing Complete Streets design improvements to improve traffic circulation; provide traffic calming, bicycle routes, and parking; and reduce vehicle-pedestrian conflicts, improve safety, and improve stormwater drainage.
- Study the potential effects of dune installation on the economic viability of the beach clubs.
- Consider mixed-use zoning and development to expand beach clubs to include diverse commercial opportunities.

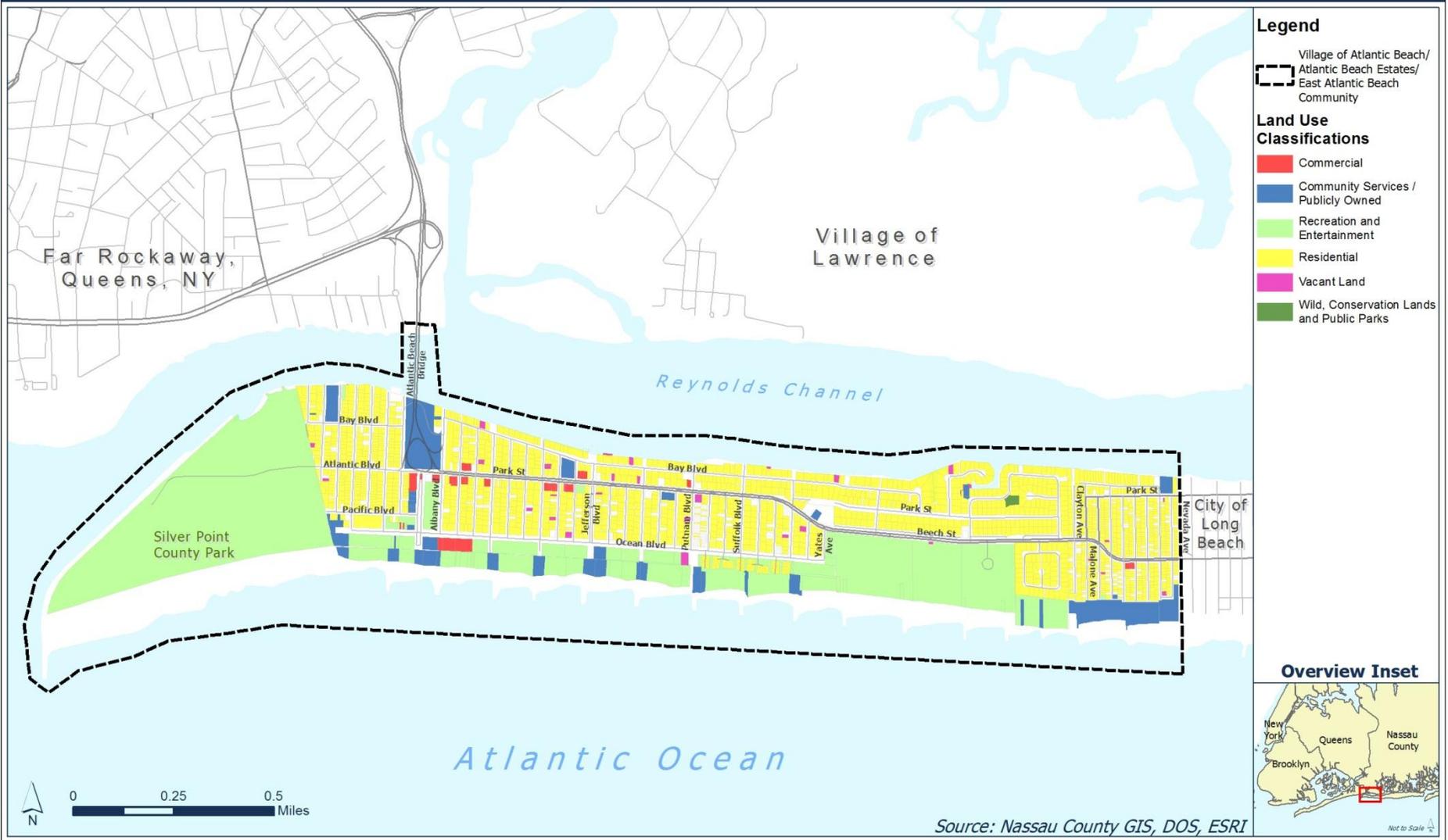
## **Housing**

### **Housing Needs**

In 2012, there were a total of 1,963 housing units in the Community, with 991 in the Village of Atlantic Beach, 314 in Atlantic Beach Estates, and 658 East Atlantic Beach.<sup>32</sup> Eighty-six percent of homes were occupied, and 13.3% were vacant.<sup>33</sup> The relatively high vacancy rate was likely the result of homes that serve primarily as summer and vacation residences. Most residences are detached single-family homes (89.2%), and the remaining units are two-family homes (8.5%) or three- to four-unit homes (2.1%).<sup>34</sup> As of 2012, there were 259 occupied units with renters.<sup>35</sup> The median rent was more than \$2,000 per month.<sup>36</sup> An estimated 32% of renters (84) had housing costs that were more than 35% of their household income.<sup>37</sup>

# Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach

Figure II-4: Land Use Classifications





**Oceanfront Houses in the Community with Fragmented Dunes**

Source: Kate Murray, Town of Hempstead Supervisor

Many of the housing units in the Community were built between 1940 and 1969 (43.1%), and a significant percentage (39.7%) were built before 1940.<sup>38</sup> Modern building codes enacted in the 1960s and later provided resiliency measures to reduce damage from floods. Many of the housing units were substantially damaged during Superstorm Sandy because of their age. Many had utilities in basements that were damaged by flooding, leading to power and service outages for most Community residents. The need to increase homeowner education to increase housing resiliency was identified as a way to mitigate damage from flooding.

The bayside surge in the Community and across the entire Barrier Island caused significant flooding and other damage to residences. The severity of this damage points to an urgent need to harden buildings and relocate utilities above the BFE to mitigate building damage from flooding and to limit the extent and duration of power outages caused by future flooding. In many cases insurance payments were inadequate to cover the cost of repairs and reconstruction of homes, many residents used personal capital to repair or rebuild their homes and continue to need financial assistance for larger infrastructure project to mitigate damage from future storms. Residents at Public Engagement Events expressed interest in the need for greater technical assistance for home repairs.

The Village of Atlantic Beach and Town of Hempstead flood damage prevention ordinances both require only two feet of freeboard, which is insufficient to insulate most of the Community from severe flood damage

during future storm events. Expanding on existing ordinances that aim to mitigate flood damage will help meet the need for improved prevention measures.

### **Housing Opportunities**

The opportunities to address the needs of residents who experienced flood damage to homes may be accomplished by:

- Supporting homeowners and beach club owners through funding and other resources to implement energy efficiency during reconstruction.
- Using housing assistance programs, such as the Community Development Block Grant and NY Rising Housing Recovery Program to provide assistance with home repair/rehabilitation, mitigation/elevation, and acquisitions as they become available. Other programs include the New York Smart Home Repair and Reconstruction Program, New York Smart Home Resilience, Small Multi-Family Repair and Reconstruction, and the Small Multi-Family Mitigation/Large Multi-Family Mitigation programs.
- Identifying or creating opportunities to secure funding allocation for floodproofing residential structures.
- Implementing stricter standards and requirements than those in the New York State Building Code to ensure the resiliency of homes that are rebuilt or renovated.

## **Health and Social Services**

### **Health and Social Service Needs**

The Community does not have high concentrations of vulnerable populations with accessibility or service provision needs. The Community identified the need to address vulnerable populations as a necessary function to ensure resiliency. These populations in the Community are as follows:<sup>39</sup>

- 181 veterans (less than 5%) and 249 people have disabilities (more than half of the disabled are 65 and older)<sup>40</sup>
- 425 speak a language other than English



**New Nautilus Hotel, Village of Atlantic Beach**

Source: LiRo

- Projections for 2020 are a significant decline (almost 18%) for individuals between 45 and 54 years old and a 31% increase in individuals 65 to 74 years old<sup>41</sup>
- 150 households (10% of all households) have incomes of \$24,999 or less and there are no designated low- and moderate-income census tracts in the Community (see Figure II-5)<sup>42</sup>
- Many residents of the New Nautilus Hotel experience mobility issues and are dependent on others for transport and medical services

These socially vulnerable populations are not adequately identified and require increased access to medical services and emergency assistance during storm events. Only one facility, a hotel near the Tennis Center on the oceanfront (with a large permanent senior population), had an evacuation plan that was implemented before Superstorm Sandy. This type of plan is needed for buildings throughout the Community.

Residents during Public Engagement Events noted the need for a full-service hospital with an emergency room as opposed to a series of smaller, urgent care facilities. The only hospital on the Barrier Island is in the City of Long Beach and is closed because of heavy damage during Superstorm Sandy. Obtaining health-related items, such as pharmaceuticals, was an issue after Superstorm Sandy, particularly for vulnerable populations. The Community

expressed a need for improved access to medical service provisions both during and after disasters.

The Community has expressed a need for designated Community Assistance Centers following storm events, particularly because the Atlantic Beach Village Hall served as the central gathering place and a Community Assistance Center during Superstorm Sandy but was inadequate in delivering critical services following the emergency. Both the Atlantic Beach Village Hall and the Tennis Center buildings are vulnerable to storm surge, wave, and wind action during hazard events. In addition, the Atlantic Beach Rescue building, a key community asset and primary service during storm events, was vulnerable to storms because of its location on the bayside under the Atlantic Beach Bridge.

### Health and Social Service Opportunities

The opportunities to address the health and social service needs of the Community may be accomplished by:

- Improving coordination with the Nassau County Office of Emergency Management and Nassau County Health Department to address health-related issues during emergencies, as well as better Community education regarding appropriate emergency preparedness techniques.
- Identifying ways to re-open the hospital on the Barrier Island.
- Coordinating and implementing evacuation and emergency preparedness plans for Nassau County, Town of Hempstead, the City of Long Beach, Lido, Point Lookout, and the Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach.

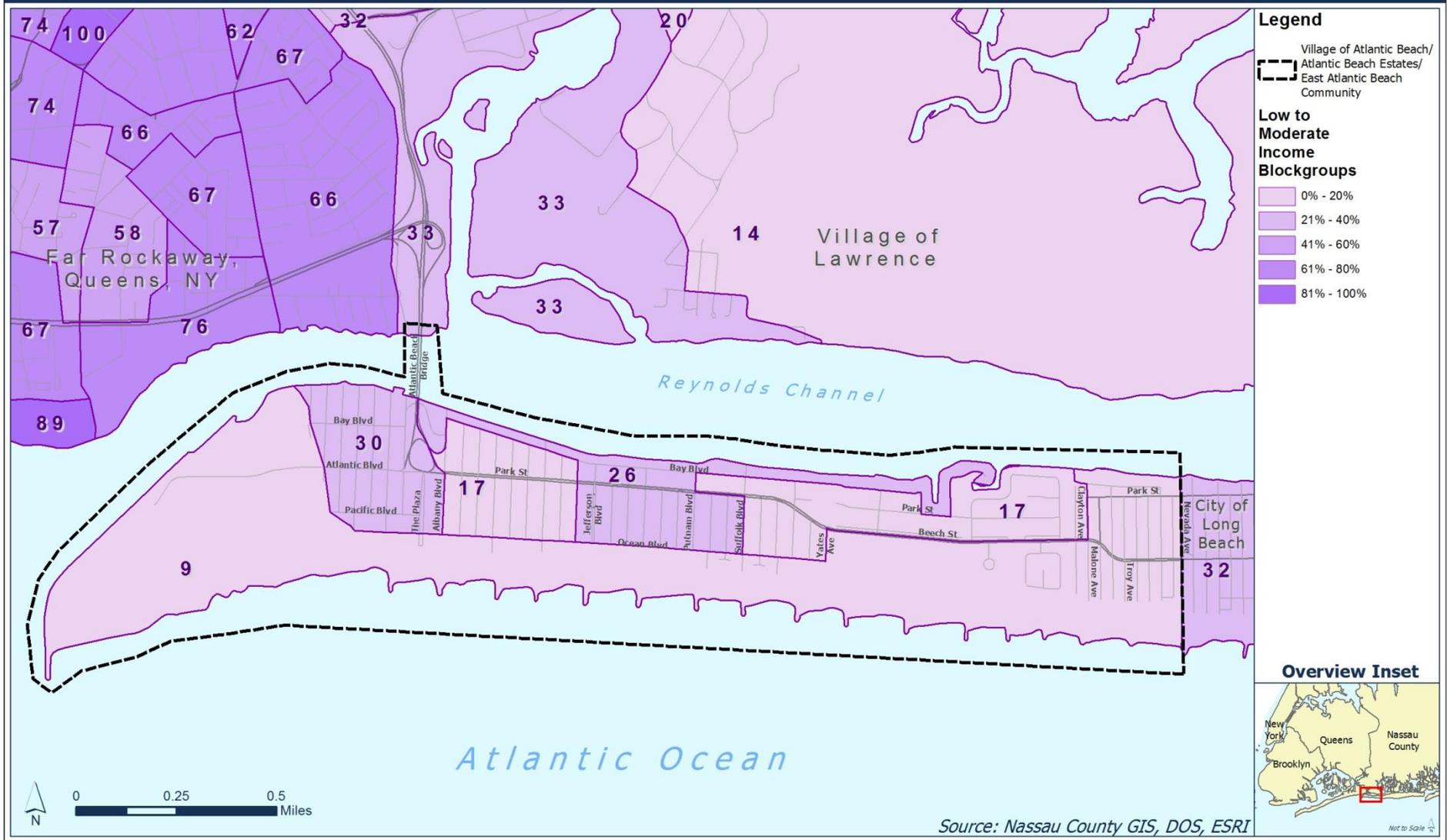
## Infrastructure

### Infrastructure Needs

Superstorm Sandy caused significant damage to many of the Community's infrastructure assets and systems. Many key facilities that did not sustain damage remain at risk because the provisional measures that were taken to protect them are inefficient and cannot be permanently relied upon, as

# Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach

Figure II-5: Percentage of Low to Moderate Income





**Pump Station damaged during Superstorm Sandy, Village of Atlantic Beach**  
Source: LiRo

described above. Community infrastructure needs were identified by the infrastructure limitations and vulnerabilities experienced during and after Superstorm Sandy. The Committee, public, and results from the online survey were all unanimous in a key desire to fortify and harden key infrastructure in the Community.

The bayside surge during Superstorm Sandy caused significant flooding throughout the Community, preventing the stormwater conveyance system from functioning properly. Buildings and other facilities experienced backflow of stormwater as a result.

New water lines with return loops and sewer lines require preventative maintenance, repair, or replacement throughout the Community. Backflow preventers are needed on bayside outflows along with an expressed interest in floodwalls at various locations throughout East Atlantic Beach. In addition, a concrete retaining wall is needed running north to south along the Nevada Avenue and Brookline Avenue beach area and park.

The Scott Drive substation experienced minor flooding during Superstorm Sandy. All three sewage pump stations, including the Scott Drive facility,

remained operational but are at high risk to damage from flooding. Given the potentially catastrophic impacts of system failure on the natural and built environments, the Community expressed the need for improved stormwater systems to mitigate potential future flooding and other impacts such as system failure from hazard events.

Discontinuous dunes were breached, resulting in damage to homes during Superstorm Sandy. The water flowing through the breaches in the dunes moved at high velocities during the storm and caused severe damage. Beach club owners and Village residents generally oppose the idea of building continuous dunes because of the potential for obscured ocean views and effects to beach access.

As discussed in Section II.B, Community Planning and Capacity Building, East Atlantic Beach and Atlantic Beach Estates do not have a Community Assistance Center. The Committee has expressed the strong desire to identify a building that can resist storm damage and function as a Community Assistance Center. This facility must also be readily accessible in the aftermath of a storm or other emergency. Appropriate facilities exist for this purpose in the Village of Atlantic Beach, but they must be hardened to mitigate risk and limit their exposure to flooding and other weather hazards.

In the Village of Atlantic Beach, the Atlantic Beach Village Hall, the Tennis Center, the water reclamation plant and its three pump stations are key infrastructure assets that are all vulnerable to storm and wind damage. Additional generator capacity is required at the reclamation plant, both to withstand prolonged power outages and ensure normal function when existing generators must be shut down for maintenance. For the same reasons, the Atlantic Beach Rescue building must be upgraded to protect existing generators; provide additional, redundant power supply; and enhance the resiliency of building communications systems.

The Community expressed the need for electrical, cable, and phone services to be installed underground throughout East Atlantic Beach along with solar-powered light-emitting diode (LED) street lights to increase safety.

East Atlantic Beach streets are in need of repair, sink holes need to be filled, and roads need to be repaved. New sidewalks and street signs are needed throughout East Atlantic Beach.

## Infrastructure Opportunities

The following are opportunities for repairing and improving the Community infrastructure to aid in emergency preparedness and response:

- Identifying improvements and alternatives to the existing stormwater drainage system, including bioswales and other low-impact development practices, to improve stormwater drainage and increase stormwater conveyance.
- Reducing impermeable surfaces, particularly surface-area parking lots, to allow for increased drainage and green infrastructure practices.
- Considering a regional and Community approach to bulkhead improvement for property owners that could mitigate the risk of damage from storm surge and flooding.
- Coordinating with the U.S. Army Corps of Engineers' (USACE's) Dune and Beach Replenishment Project to assess beach renourishment and planning for dune development.
- Developing plans for a floodwall under the Boardwalk as a method of providing flood protection. The City of Long Beach incorporated this protection into the reconstruction of the Long Beach boardwalk.
- Considering maintenance that would be conducted by the Village of Atlantic Beach and would include inspections of storm drains, outfalls, and bulkheads to ensure functionality.
- Designating a centralized Community Assistance Center in the Community to coordinate supplies and coordinate between the Community, Nassau County, Town of Hempstead, and Village of Atlantic Beach. Selecting the location of the facility carefully to allow access to supplies and prevention of looting is recommended.
- Considering solar generators at the Tennis Center as an alternative power source for emergencies.
- Evaluating improvements to the power grid, including smart grid infrastructure, for backup power and telecommunications systems in emergency/rescue buildings.
- Hardening and converting electric and gas lines to marine-grade power lines to improve resiliency.

## Natural and Cultural Resources

During Superstorm Sandy, beaches and boardwalks were badly damaged by exposing the Community to storm-related risk. East Atlantic Beach dunes in particular were damaged by the storm. The East Atlantic Beach dunes, beaches, and parks/facilities need to be repaired, strengthened, and upgraded. The Committee recommends preserving and strengthening beach access through the construction of dune system walk-over/drive-over bridges, with the proviso that the Town of Hempstead Special Parks District and resident-only status remain.

Residents generally supported a dune system with the caveat that the system must be barrier-island wide. The public continued to register strong support for hard and soft infrastructure solutions to mitigate stormwater and flooding events and the need to address sewer and wastewater systems. Residents, particularly from East Atlantic Beach, frequently expressed the need for a perimeter dune system. Community support includes an assessment of the extent of damage from Superstorm Sandy to vegetation, trees, and water ecology. Trees and landscaping are also needed at various locations throughout East Atlantic Beach.



Protected dunes, East Atlantic Beach  
Source: URS

The approximately 100-acre Silver Point County Park is owned by the Nassau County Parks and Recreation Department. The park is leased by Surf Point Corporation and is operated as a private beach club. A portion of the park is set aside as a bird sanctuary for piping plovers. Regional coordination is needed among Nassau County, the Surf Point Corporation, and the Village of Atlantic Beach to address dune restoration and mitigation.

### **Natural and Cultural Resource Opportunities**

The following are opportunities for repairing and improving the Community's natural and cultural resources to help provide emergency response and preparation:

- Considering dune planting and vegetation stabilization programs and improvements to Boardwalk facilities, including beautification and green infrastructure, for the aesthetic benefits and protection of the Community from storm damage.
- Incorporating the Silver Point County Park, its lessee, and its beach club into planning efforts for the Village of Atlantic Beach.
- Providing resources and funding for testing water quality and remediation efforts as necessary.
- Consulting with the USACE on planning efforts, particularly those related to beach nourishment and dune construction and any necessary groin reconstruction or boardwalks.
- Promoting green infrastructure, increasing the tree canopy, and providing recreational opportunities throughout the Community and the oceanfront areas during reconstruction.



## **Section III: Reconstruction and Resiliency Strategies**

# Section III:

## Reconstruction and Resiliency Strategies

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The NY Rising Community Reconstruction (NYRCR) Planning Committee (Committee) developed the reconstruction and resiliency strategies that are described in this section based on experience as residents of the Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach (Community), insights gained from the visioning process, and information gained through the needs and opportunities assessment and risk assessment processes.

The Committee prioritized potential strategies according to metrics that included experience in the Superstorm Sandy disaster and the approach to addressing opportunities. The strategies were used as a framework for developing construction projects, policy directions, or other actions. The strategies represent the Committee's general recommendations for achieving rebuilding, resilience, and economic growth.

The Committee initially discussed key strategies at a Committee Meeting on September 25, 2013. The Committee continued to develop and refine the strategies at subsequent Committee Meetings based partially on public input from the second Public Engagement Event on November 13, 2013. Both the Community and Committee consistently identified fortifying, restoring, and repairing infrastructure as a priority.

The Committee identified resiliency and mitigation strategies related to needs associated with all six Recovery Support Functions. Given the magnitude of the storm surge and flooding associated with Superstorm Sandy, it was inevitable that coastal communities such as the Village of Atlantic Beach and East Atlantic Beach would experience a significant level of damage.

The Committee recognized that the failure or underperformance of key infrastructure systems was a factor in magnifying the resulting damage. The effects of prolonged, geographically extensive power outages were compounded by a lack of redundancy and power generation capacity at the local and building-specific levels. Many of the Committee's infrastructure strategies deliver environmental benefits, most notably improved water quality. The basis of many strategy discussions was the Committee's desire to increase the resiliency of assets that directly support community residents,

such as infrastructure, protection of homes and businesses, and emergency response capabilities.

The six Recovery Support Functions that are defined in Section II are relevant to the Community as follows:

**Infrastructure** systems are critical to the Community, providing essential networks and services that residents, businesses, and guests depend on for day-to-day activities. The infrastructure strategy takes into consideration how the Community will restore, protect, fortify, and manage existing essential infrastructure and future infrastructure projects. This strategy would enhance community resilience and protect housing, economic, health and social services, and natural and cultural resources assets.

**Health and Social Services** are vital to ensuring the health and welfare of residents in the Community, as well as facilities that serve the whole Community. Socially vulnerable populations need special consideration because they face challenges in obtaining necessary health and social service resources. The health and social services strategy addresses how the Community will restore and improve essential health and social services, particularly to vulnerable populations, as well as maintain essential emergency responder functions during emergencies.

**Economic Development** can help provide a sound financial base for the Community to thrive and will help fund future resiliency actions. The methods the Community will use to improve economic activities and enhance the Community's economic well-being will involve assessing existing businesses and improving economic opportunity, as detailed later in this section. The Community is evaluating opportunities to tie in resiliency and infrastructure improvements with key economic assets.

**Community Planning and Capacity Building** are needed to achieve greater resiliency. Although the Community has rebuilt and accomplished much since Superstorm Sandy, continuous planning and action will be necessary to develop a sustainable disaster recovery approach to coordinate



**Reconstruction of The Sands Beach Club deck, Atlantic Beach**  
Source: FEMA/Kenneth Wilsey

with other disaster recovery entities and include all residents affected by the storm.

**Housing** that is safe and resilient is essential for current and future residents of the Community. If homes are not resilient or sustainable, resident property owners may not be able to rebuild after a storm and will suffer substantial financial losses. The Committee explored options for infrastructure projects to protect housing.

**Natural and Cultural Resources** are important for health, general welfare, recreation of residents and guests, and the economic assets of the Community. The oceanfront beaches are a vital natural resource but are also a hazard zone. The natural and cultural resources strategy addresses these important resources from a risk reduction and economic development perspective.

Metrics such as resiliency effects, time frame, and technical feasibility were used to advance the strategies into a series of capital projects, feasibility studies, policy implementation, and regional cooperation efforts for the

purpose of recovering and rebuilding from the impacts of Superstorm Sandy and Hurricane Irene. These strategies are intended to make the NYRCR Community more resilient.

Coordination among State, Regional, and local planning entities and the planning efforts of the Committee and Public Engagement Events in October 2013, December 2013, and February 2014 have been essential to the development of the key strategies, projects, and management measures discussed here. The strategies, projects, and management measures were developed after the identification of needs and opportunities, resulting from an assessment of the effects of Superstorm Sandy and Hurricane Irene. The NYRCR Plan aims to identify both short- and long-range recovery strategies that protect community assets and capitalize on existing needs and opportunities. Primary considerations throughout the development of these strategies and actions have included assessment of risk to the Community and its assets, the combined benefits of projects, protection of critical facilities, value to the community, timing and coordination, estimated project costs, and the availability of funding. The strategies and projects reflect the needs of the community and include cost and feasibility factors.

Detailed information on the Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach's Proposed and Featured Projects is provided in Section IV.

The strategies are part of the Community's larger vision to increase resiliency, sustainability, and prosperity through projects and actions. Each strategy is important on its own, and the Committee sought to address specific strategies when formulating projects and actions. The discussion of the reconstruction and resiliency strategies include Proposed and Featured Projects that will help implement the strategy. The strategies, actions, and projects identified through the planning process are tailored approaches for a comprehensive recovery that positions the Community for greater future success.

Project ideas that evolved from the Committee discussions are classified as Proposed Projects, Featured Projects, or Additional Resiliency Recommendations. For the purposes of the NYRCR planning process, Proposed and Featured Projects and Additional Resiliency Recommendations, are defined as follows:

- **Proposed Projects:** Projects designed to be fully funded through the NYRCR Program using the Community's allocation of CDBG-DR funds.
- **Featured Projects:** Innovative projects and actions that the Planning Committee has identified as important resiliency recommendations and has analyzed in depth, but has not proposed for funding through the NYRCR Program.
- **Additional Resiliency Recommendations** Additional Resiliency Recommendations are projects and actions that the Planning Committee would like to highlight and that are not categorized as Proposed Projects or Featured Projects

The estimated costs in the project profile tables in Section III are based on project' capital costs, which are based on industry-accepted unit costs using the currently available information. Costs are likely to change as projects are developed further and additional information is gathered during the implementation phase of the NYRCR planning process.

The six strategies are:

- #1 Protect critical infrastructure to create community resilience and sustainability to ensure continuing services needed before, during, and after disasters.
- #2 Increase the Community's capacity to facilitate and foster actions that lead to greater resiliency, emergency preparedness, and sustainability.
- #3 Implement measures to make the Community's economic drivers more resilient.
- #4 Protect critical Community health and social services assets and increase the capacity to provide needed emergency and community services before, during, and after disasters.
- #5 Encourage and facilitate housing resiliency and sustainability measures throughout the Community.
- #6 Restore and enhance natural resources for both resiliency and recreation purposes while also protecting important cultural resources.



**#1 Protect critical infrastructure to create community resilience and sustainability to ensure continuing services needed before, during, and after disasters**



**Replacement of the wood pilings that were destroyed by Superstorm Sandy with steel, reinforced concrete pilings at the Ocean Club**  
Source: FEMA/Kenneth Wilsey

This section considers how the Community will restore, repair, and manage the essential infrastructure provided by private entities and local governments. Strategies, actions, and projects were developed that address infrastructure resiliency and mitigation. The Committee, with assistance from Public Engagement Event participants, determined the following actions for infrastructure improvement:

- Identify and implement site-specific remedies and improvements that can be implemented quickly
- Expand stormwater infrastructure through a system of conveyance and storage systems for improved stormwater management and drainage

- Implement stormwater management best practices and prioritize areas with immediate needs for improved stormwater management by using green infrastructure
- Improve traffic congestion, traffic circulation, traffic calming, bicycle routes, safety, and parking and reduce vehicle-pedestrian conflicts by implementing Complete Streets design considerations

The Community used extraordinary measures to keep the Water Reclamation Plant and the Atlantic Beach Village Hall operating after Superstorm Sandy. The Water Reclamation Plant continued to operate despite saltwater incursion that burned out power feeders supplying the plant. The Scott Drive substation received minor flooding damage. The Tennis Center suffered relatively superficial building damage during Sandy. High winds stripped siding from the building and broke windows in the building's skylight system. In large measure, though, the building's vulnerability is a function of its susceptibility to sustained power outages.

The Community had no power for weeks after the storm. The lack of backup power sources is a major challenge during storm events for the Community. Alternative energy solutions include the provision of solar street lights throughout the entire Community. Solar-powered streetlights are proposed throughout the Community, including in critical facilities locations and intersections along the main corridor that connects with the county-designated evacuation route. Ocean storm surge coupled with bayside surge and flooding caused damage to residential and commercial structures. Flooding affected key infrastructure including, pumping stations, underground utilities, stormwater infrastructure, and the conveyance system. Low-impact development practices including improved drainage, storm drain covers, and back flow preventers would help mitigate future flooding events.

Capital projects, feasibility studies, and funding opportunities are important elements of implementing infrastructure strategies. Technical support and coordination among the Community with Nassau County and the Town of Hempstead are important in finalizing and implementing large-scale infrastructure projects. Addressing the regional coordination and potential economic impact of projects such as a dune system or a microgrid power system are necessary aspects of the ultimate success of these projects.

The Proposed and Featured Projects for Strategy #1 are listed in Table III-1.

**Table III-1: Strategy #1 – Proposed and Featured Projects**

<b>Strategy #1: Protect critical infrastructure to create community resilience and sustainability to ensure continuing services needed before, during, and after disasters</b>				
<b>Project Name</b>	<b>Short Project Description</b>	<b>Estimated Cost</b>	<b>Proposed or Featured Project</b>	<b>Regional Project (Y/N)</b>
Harden Water Reclamation Plant	Provide resiliency to the existing Water Reclamation Plant and three pump stations to maintain functionality during rain and hazard events	\$720K	Proposed	N
Emergency Medical Services	Protect and fortify the existing Atlantic Beach Rescue Building through improved infrastructure and communication systems	\$460K	Proposed	Y)
Complete Streets/Drainage Improvements along Beech Street	Use Complete Streets to provide phased drainage and street improvements along emergency evacuation routes through stormwater best management practices, infrastructure improvements, and traffic safety and management measures	\$5.5M	Proposed	Y
Solar-Powered Street Lights	Provide LED street lighting that is hurricane resistant and solar powered to prevent loss of lighting in the event of power outages	\$1.3M	Proposed	Y
Install Backflow Preventers	Install backflow preventers throughout the Community and storm drain covers throughout the entire NYRCR Community to mitigate flooding and prevent debris from entering drains	\$360K	Proposed	Y
Assess Feasibility and Economic Impact of Perimeter Dune System	Conduct a study of the cost-effectiveness and technical feasibility of a perimeter dune system	\$500K	Proposed	Y
Microgrid Power System	Conduct a feasibility study and implement a power microgrid system throughout the NYRCR Community	\$19.2M	Featured	Y
Underground Utilities Feasibility Study	Conduct a feasibility study to determine the potential for underground utilities in areas, specifically East Atlantic Beach, that are not at extreme risk of flooding	\$100K	Featured	N
Stormwater System Improvements	Study adaption of existing open spaces for floodwater catch basins	\$10K	Featured	Y



## #2 Increase the Community's capacity to facilitate and foster actions that lead to greater resiliency, emergency preparedness, and sustainability



**Third Public Involvement Event, February 12, 2014**

Source: URS

This section focuses on the methods the Community proposes to restore and/or enhance the ability to organize, plan, manage, and implement recovery planning and capacity building. Actions address regional coordination with the rest of the Long Beach Barrier Island (Barrier Island) communities. Actions related to the strategies the Committee and Community developed are:

- Review and revise municipal procedures to improve emergency preparedness, management, and response protocols
- Improve links between members of the Community and the physical environment of the Community by identifying locations for urban gardens, plazas, squares, or courtyards
- Repurpose public buildings to create emergency meeting facilities for use after major storms

For improved resiliency to future disasters, the Community has expressed a primary desire to improve emergency preparedness and recovery functions. A lack of communication was frequently cited in both Committee Meetings and Public Engagement Events as a major issue during and after Superstorm Sandy. Strategies to improve communications and emergency planning capacity and functions will help increase the Community's resiliency. The risks associated with Superstorm Sandy and potential future storm events are addressed through capital and non-capital projects to help protect against future hazards to the NYRCR Community.

Coordination of local zoning and planning efforts with Nassau County, the Town of Hempstead, the Village of Atlantic Beach and the City of Long Beach will be essential in promoting regional planning approaches and adopting best practices related to hazard mitigation and stormwater management. Funding and technical assistance for shared service projects are key components to the functionality and timeliness of project implementation.

The Proposed and Featured Projects for Strategy #2 are listed in Table III-2.

**Table III-2: Strategy #2 – Proposed and Featured Projects**

<b>Strategy #2: Increase the Community’s capacity to facilitate and foster actions that lead to greater resiliency, emergency preparedness, and sustainability</b>				
<b>Project Name</b>	<b>Short Project Description</b>	<b>Estimated Cost</b>	<b>Proposed or Featured Project</b>	<b>Regional Project (Y/N)</b>
Village of Atlantic Beach Community Assistance Center	Retrofit the Tennis Center to be used as a Community Assistance Center in the Village of Atlantic Beach, including improvements to drainage and the incorporation of active and passive recreational elements	\$2M	Proposed	N
East Atlantic Beach Community Assistance Center Feasibility Study	Evaluate and identify a location for a Community Assistance Center in Atlantic Beach Estates and East Atlantic Beach	\$50K	Proposed	N
Emergency Preparedness Guidebook	Draft and disseminate an emergency preparedness guidebook in coordination with Nassau County, Town of Hempstead, and the City of Long Beach for distribution to all residents.	\$100K	Featured	Y
Atlantic Beach Village Hall	Provide upgrades and protection to Atlantic Beach Village Hall to maintain continuity of operations and protect vital records during and after storm events	\$400K	Proposed	N



### #3 Implement measures to make the Community's economic drivers more resilient



Separating debris from the sand during cleanup from Superstorm Sandy  
Source: FEMA/Kenneth Wilsey

This section focuses on how the Community proposes to enhance economic development and create economic opportunities. The following economic actions are proposed:

- Improve the economic viability of beach clubs
- Improve streetscapes to enhance economic growth
- Improve infrastructure to support economic activity

The focus of economic enhancement is primarily on the beach clubs, the Community's primary economic assets that suffered substantial damage during Superstorm Sandy (and also during Hurricane Irene but to a lesser degree). The beach clubs are located in designated Federal Emergency Management Agency (FEMA) flood zones. Providing economic opportunities in the form of technical support and planning is imperative for the future viability of these key economic and Community assets. The provision of effective and sustainable infrastructure will help create economic opportunity.

The Village of Atlantic Beach and East Atlantic Beach do not currently have economic development plans, which are central in the development of business continuity plans. Developing an economic development plan for the Community may include reviewing land use patterns and zoning designations in addition to developing strategies to support small businesses and possibly support local entrepreneurship.

An assessment of existing land use and infrastructure along the oceanfront areas currently zoned marine recreation is proposed. The evaluation would include economic impacts and an assessment of whether the infrastructure is adequate. Vulnerability is an especially critical problem for the beaches and private beach clubs along the Atlantic Ocean. Resiliency strategies, including dune construction, may affect the profitability of the beach clubs and need to be thoroughly investigated. Incorporation of improved and new utility systems would require funding and technical assistance for implementation.

The Proposed and Featured Projects for Strategy #3 are listed in Table III-3.

**Table III-3: Strategy #3 – Proposed and Featured Projects**

<b>Strategy #3: Implement measures to make the Community's economic drivers more resilient</b>				
<b>Project Name</b>	<b>Short Project Description</b>	<b>Estimated Cost</b>	<b>Proposed or Featured Project</b>	<b>Regional Project (Y/N)</b>
Assess Feasibility and Economic Impact of Perimeter Dune System	Study the cost-effectiveness and technical feasibility of a dune perimeter system including benefits and risks	\$500K	Proposed	Y
Cell Phone Tower Resiliency	Improve cell phone tower resiliency during emergencies	\$1.6M	Featured	Y



**#4 Protect critical Community health and social services assets and increase the capacity to provide needed emergency and community services before, during, and after disasters**



**First Public Involvement Event October 16, 2013**

Source: Sustainable Long Island

This section addresses how the Community will restore and improve essential health and social services with particular focus on addressing vulnerable populations. The following health and social service actions are proposed:

- Provide protection and services for vulnerable populations, especially during emergencies

- Provide information to residents about emergency preparedness and emergency shelter information
- Ensure a unified chain of command to provide up-to-date information to residents
- Repurpose public buildings to create emergency meeting facilities and Community Assistance Centers for use prior to, during, and after major storms

The Community needs a formal Community Assistance Center and emergency protocols to ensure the resiliency of its health and social services during potential future storm events. The lack of communication between the community and first responders and officials during and after the storm events was frequently mentioned by East Atlantic Beach members during Committee Meetings and Public Engagement Events. East Atlantic Beach Committee members reported that they felt cut off and isolated and sought assistance from the Village of Atlantic Beach. The Community Assistance Center project would address providing improved communications in the event of future disaster events.

The Proposed and Featured Projects for Strategy #4 are listed in Table III-4.

**Table III-4: Strategy #4 – Proposed and Featured Projects**

<b>Strategy #4: Protect critical Community health and social services assets and increase the capacity to provide needed emergency and community services before, during, and after disasters</b>				
<b>Project Name</b>	<b>Short Project Description</b>	<b>Estimated Cost</b>	<b>Proposed or Featured Project</b>	<b>Regional Project (Y/N)</b>
Emergency Preparedness Guidebook	Draft and disseminate an emergency preparedness guidebook in coordination with Nassau County, Town of Hempstead, and the City of Long Beach for distribution to all residents.	\$100K	Featured	Y



## #5 Encourage and facilitate housing resiliency and sustainability measures throughout the Community



**Single Family Residence, Village of Atlantic Beach**  
Source: FEMA/ Eliud Echevarria

This section focuses on how the Community will meet the demand for affordable housing, promote affordability to those displaced by the storm, and encourage the provision of disaster-resistant housing for all income levels. The following housing actions were proposed:

- Inform residents about emergency preparedness and emergency evacuation and shelters
- Examine opportunities that would provide residents with a unified chain of command for up-to-date information during storm events
- Help provide assistance to restore and repair residential damage caused by Superstorm Sandy

Flooding and bayside surge from Superstorm Sandy damaged many residential, commercial, and utility structures throughout the Community. Local ordinances mandate some level of hazard mitigation, but they apply only to new structures. Existing structures are not protected from severe damage during future storm events, particularly from flooding.

More stringent zoning codes and implementation of local flood damage prevention ordinances across the Community are important in addressing housing risks and needs. An assessment of zoning and building codes and their implementation could address increased levels of hazard mitigation, especially for flooding.

The Proposed and Featured Projects for Strategy #5 are listed in Table III-5.

**Table III-5: Strategy #5 – Proposed and Featured Projects**

<b>Strategies #5. Encourage and facilitate housing resiliency and sustainability measures throughout the Community</b>				
<b>Project Name</b>	<b>Short Project Description</b>	<b>Estimated Cost</b>	<b>Proposed or Featured Project</b>	<b>Regional Project (Y/N)</b>
Emergency Preparedness Guidebook	Draft and disseminate an emergency preparedness guidebook in coordination with Nassau County, Town of Hempstead, and the City of Long Beach for distribution to all residents.	\$100K	Featured	Y
Identification of Vulnerable and Special-Needs Populations	Identify vulnerable and special-needs populations through a special-needs registration.	\$8K	Featured	Y



**#6 Restore and enhance natural resources for both resiliency and recreation purposes while also protecting important cultural resources**



**Oceanfront, Village of Atlantic Beach**  
Source: Kate Murray, Town of Hempstead Supervisor

This section addresses the management of natural and cultural resources from a risk reduction and economic development perspective for the Community. Actions for this section include enhancing existing resources, educating the community, and evaluating the potential for re-establishing natural dune systems.

The Committee, with assistance from Public Engagement Event participants, determined the following actions for natural and cultural resources:

- Investigate options for dune restoration and a perimeter system, which should include flexibility for beach clubs and explore multiple options for future uses
- Gauge interest in adapting existing open spaces and parks as significant storm floodwater catch basins

Superstorm Sandy affected dune systems, natural habitats, and the Community beaches and boardwalks, all of which are important natural and cultural assets. The Community has a primary need not only to reconstruct existing damaged resources but also to expand and integrate natural areas as a form of stormwater management and green infrastructure in infrastructure projects.

The Proposed and Featured Projects for Strategy #6 are listed in Table III-6.

**Table III-6: Strategy #6 – Proposed and Featured Projects**

<b>Strategy #6: Restore and enhance natural resources for both resiliency and recreation purposes while also protecting important cultural resources</b>				
<b>Project Name</b>	<b>Short Project Description</b>	<b>Estimated Cost</b>	<b>Proposed or Featured Project</b>	<b>Regional Project (Y/N)</b>
Assess Feasibility and Economic Impact of Perimeter Dune System	Study the cost-effectiveness and technical feasibility of a dune perimeter system on the beach clubs including benefits and risks	\$500K	Proposed	Y
Stormwater System Improvements	Study adaption of existing open spaces for floodwater catch basins	\$10K	Featured	Y





## **Section IV: Implementation – Project Profiles**

# Section IV:

## Implementation – Project Profiles

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The NYRCR Program has allocated to the Community up to \$9.0 million (Village of Atlantic Beach: up to \$3.0 million; East Atlantic Beach and Atlantic Beach Estates: up to \$6.0 million, collectively). The funding is provided through the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) program. While developing projects and actions for inclusion in the NYRCR Plan, Planning Committees took into account cost estimates, cost-benefit analyses, the effectiveness of each project in reducing risk to populations and critical assets, feasibility, and community support. Planning Committees also considered the potential likelihood that a project or action would be eligible for CDBG-DR funding.

The projects and actions set forth in the NYRCR Plan are divided into three categories. The order in which the projects and actions are listed in the NYRCR Plan does not necessarily indicate the Community's prioritization of these projects and actions. Proposed Projects are projects proposed for funding through the Community's allocation of CDBG-DR funding. Featured Projects are projects and actions that the Planning Committee has identified as important resiliency recommendations and has analyzed in depth, but has not proposed for funding through the NYRCR Program. Additional Resiliency Recommendations (see Section V) are projects and actions that the Planning Committee would like to highlight and that are not categorized as Proposed Projects or Featured Projects.

The total cost of Proposed Projects in the NYRCR Plan exceeds the NYRCR Community's CDBG-DR allocation to allow for flexibility if some Proposed Projects cannot be implemented due to environmental review, HUD eligibility, technical feasibility, or other factors. Implementation of the projects and actions found in the NYRCR Plan are subject to applicable Federal, State, and local laws and regulations, including the Americans with Disabilities Act (ADA). Inclusion of a project or action in the NYRCR Plan does not guarantee that a particular project or action will be eligible for CDBG-DR funding or that it will be implemented.

Section IV provides project profiles for the Proposed and Featured Projects identified by the NY Rising Community Reconstruction (NYRCR) Planning Committee and NYRCR Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach (Community). The project profiles are not listed according to priority, importance, or rank. The Proposed and Featured Projects were identified, selected, and advanced as a response to the risks, needs, and opportunities described in Section II of the NYRCR Community Plan.

The Proposed and Featured Projects are some of the implementation mechanisms for the reconstruction and resiliency strategies described in Section III. The projects are expected to be implemented in the near future to build resiliency and fulfill other important Community goals.

The project profiles indicate whether the project has regional significance. Regional significance can mean that a Proposed or Featured Project protects an asset that is used by several communities (e.g., the potential for flooding is reduced on an established evacuation route) or an adjacent Community (e.g., a community restores the dunes and the neighboring community also proposes the same or similar project).

The projects were initially categorized with a basic project description, the Recovery Support Function beneficiaries of the project (e.g., public/private, local/regional) were articulated, and basic cost categories were provided. The projects then underwent an initial feasibility and funding evaluation in which various sources of funding for the projects were explored. Three site visits were conducted of the proposed project locations to view the sites and discuss technical project details.

The Committee used input from State experts, including the State Agency Review Team (SART), which aided in reviewing the project proposals, input from the Public Engagement Events, and the results of online surveys to make decisions about which projects to select as Proposed and Featured. The project selections at the Public Engagement Events were generally consistent with the Committee's selection of projects. Section V.C provides more information about Public Engagement Events.



The project profiles in this section include a detailed description of each project and information on a cost-benefit analysis and risk-reduction analysis, two important elements used by the Committee to evaluate the value of each project. The benefits are presented with qualitative descriptions that demonstrate how the projects assist the Community in economic, environmental, and health and social services. The cost-benefit analysis and risk-reduction analysis are described in the following subsections.

## Cost-Benefit Analysis

A cost-benefit analysis (CBA) is a tool used to calculate and compare the benefits and costs associated with a project. The CBA provides decision-makers with a framework for comparing different projects (i.e., anticipated cost of implementation against total expected benefits) and determining whether the benefits of a particular project outweigh the costs. The value of a CBA is twofold: (1) to inform the Committee as it formulates and prioritizes projects for implementation and (2) to help the Community prepare grant applications for Community Development Block Grant – Disaster Recovery (CDBG-DR) funds and other funding opportunities that are identified in the future.

Because the NYRCR Program is a community-driven process, the CBA is focused on identifying project costs and benefits that relate directly to the communities that the Committee represents. Community and Committee input, informed by an understanding of local conditions, needs, and community values, plays a crucial role in the selection of projects that would be implemented. Risk-reduction benefits are included in this analysis and are described in terms of how much a Proposed or Featured Project would lower the vulnerability to damage from potential future disasters. The additional benefits of the projects are provided in descriptive qualitative terms that explain how these projects bring additional value to the community.

The costs and benefits that are considered in the CBA are explained in the following paragraphs.

### Project Costs

Project profiles include an estimated cost for implementing the project. Factors contributing to the life-cycle costs of the project (e.g., operation and

maintenance costs) are described in general terms. The CBA cannot forecast costs or benefits with complete certainty. It provides the Community with the potential estimated costs of project implementation and the potential benefits that would accrue to the Community with the particular project in place.

The cost of implementing a project is just one aspect of the justification for funding a project. Another important variable is the future cost of *not* implementing the projects, which has the potential to negatively affect the long-term viability of the Community. Although “lost opportunity” costs do not always lend themselves to quantification, they are no less important to the analysis and are therefore addressed qualitatively. These costs include:

- Economic loss to residents and to local and regional employers as a result of the inability to work
- Hindrance in the provision of life-safety and emergency services, resulting in repeated inability to access vast areas of the community
- Extensive, repetitive damage to personal property (vehicles, residences) and public infrastructure resulting from frequent recurring flooding and future storm events

### Project Benefits

The types of benefits that are considered in the CBA are:

- **Risk reduction:** Extent to which a project reduces the risk of damage to a Community asset from a future storm event (discussed further under each project profile as a “Risk-reduction analysis”)<sup>43</sup>
- **Economic:** A project’s potential for minimizing economic costs and reducing the time needed for the local economy to rebound from a storm event. Economic data included, where applicable, an estimate of permanent jobs secured or added; relationship to, and/or furtherance of, Regional Economic Development Plan goals, specifically the *Strategic Economic Development Plan for Nassau and Suffolk Counties*<sup>44</sup>; potential for additional economic activity; and the net effect on local municipal expenditures.<sup>45</sup>
- **Health and social services:** Qualitative information on the population benefits of improved access to health and social service facilities



including public safety services and the degree to which essential health and social service facilities are able to provide services to a community during a future storm or weather event as a result of the project.

- **Environmental protection:** Benefits include the protection of crucial environmental assets or high-priority habitat, threatened and endangered species, migration, or habitat connectivity; any cleanup resulting from the action; creation of open space; or a new recreational asset such as the Atlantic Beach Community Assistance Center Tennis Center that proposes stormwater mitigation under recreational amenities.

## Risk-Reduction Analysis

A risk-reduction analysis estimates the extent to which a project would lower the flood risk to identified Community critical assets and population when the project is in place. The risk-reduction analysis uses information from the risk assessment discussed in Section II to determine the risk of an asset before the project implementation. It then estimates how the risk will be lowered by showing how much the project would lower the vulnerability score.

### A. Proposed Projects

Proposed Projects are projects proposed for funding through a community's allocation of Community Development Block Grant Disaster Recovery (CDBG-DR) funding. The Committee developed and selected the Proposed Projects based on input from residents during multiple Public Engagement Events and

comments received through the NYRCR Program website. The locations of the Proposed Projects are depicted on Figure IV-1.

The Proposed Projects, in no particular order or prioritization, are as follows:

- Harden Water Reclamation Plant
- Emergency Medical Services
- Complete Streets/Drainage Improvements along Beech Street
- Solar-powered Street Lights
- Village of Atlantic Beach Community Assistance Center
- East Atlantic Beach Community Assistance Center Feasibility Study
- Install Backflow Preventers
- Assess Feasibility and Economic Impact of Perimeter Dune System
- Atlantic Beach Village Hall

The project criteria symbols are categorized under the following recovery support functions:



# Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach

Figure IV-1: Proposed Project Locations



- Harden Water Reclamation Plant Project Location
- Emergency Medical Services Project Location
- Solar-Powered Street Lights Project Location
- Install Storm Drain Covers Project Location
- ▨ Install Backflow Preventers Project Location
- Complete Streets/Drainage along Beech Street Project Location
- Village of Atlantic Beach Community Assistance Center Project Location
- ▩ East Atlantic Beach Community Assistance Center Feasibility Study Location
- Perimeter Dune Feasibility Study Project Location
- Atlantic Beach Village Hall Project Location

Source: TwoTwelve





# Harden Water Reclamation Plant

VAB

## Fortify the Existing Water Reclamation Plant and Three Pump Stations

**Project description:** During Superstorm Sandy, flooding and power outages nearly caused the failure of the Water Reclamation Plant (Plant). Saltwater incursion through electrical manhole covers burned out power feeders supplying the Plant. The Scott Drive substation received minor flooding damage. This damage notwithstanding, the Plant and its associated sanitary pumping stations remained functional despite having to rely on auxiliary pumps and generators.

The continuous operation was thanks to extraordinary preparation and work by Plant staff during and after the storm. The effort protected the Plant and minimized bypass of raw and partially treated sewage into Reynolds Channel. Failure of the Plant would put the environment and health of the Community at risk. The Nassau County Bay Park Sewage Treatment Plant, which discharges its effluent into Reynolds Channel, was severely damaged by the storm surge from Superstorm Sandy. It caused an estimated 104 million gallons of untreated sewage to enter Rockaway Channel in the 42 hours after Sandy.<sup>46</sup> To ensure the health and welfare of the Bay Park and surrounding community residents against future storm impacts, FEMA has provided Nassau County with \$810 million to harden that facility.

### Village of Atlantic Beach



- Harden Water Reclamation Plant Project Location
  - Substation Locations
- Source: TwoTwelve

**\$ Cost Estimate**  
\$720,000

**L Timeline**  
Three months

The Committee identified mitigation of risk to the Plant as a key objective from the beginning of the planning process. The Committee and the Greater Atlantic Beach Water Reclamation District (GABWRD) staff both recognized that emergency reliance on provisional measures is not a sustainable means of safeguarding the Plant against future hazard events. The Committee drafted the Infrastructure actions and a strategy related to implementation of site-specific remedies and improvements specifically with Plant protection in mind. The Committee facilitated site visits to the Plant and its substations that permitted assessment of existing conditions. Based on these visits, a project scope was developed that supports GABWRD’s proposals to harden the Plant to mitigate flood risk.

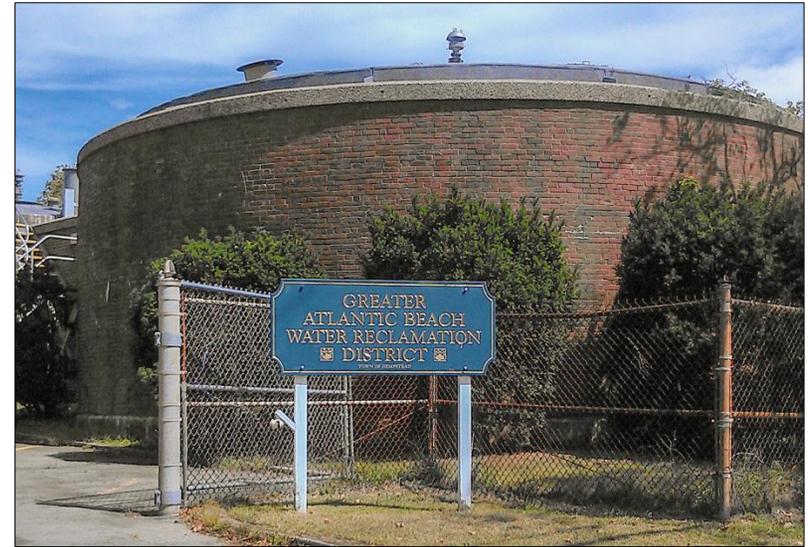
This project would increase the resiliency of the Water Reclamation Plant and three sanitary pumping stations in the Village of Atlantic Beach and in Atlantic Beach Estates through the installation of four elevated generators as backup power sources. The project would also remove and replace approximately six existing doors with watertight bulkhead-type doors at building entrances to prevent flooding and maintain functionality during rain and hazard events.

**Short description:** Provide resiliency to the existing Water Reclamation Plant and three pump stations to maintain functionality during rain and hazard events.

**Project cost:** \$720,000. This cost projection assumes the installation of four elevated generators, one at each of the existing pumping stations.

### Benefit or Co-Benefits to Be Derived from the Project

**Health and Social:** The Plant serves the entire Community. Hardening the Plant would limit bypass of raw or partially treated sewage into Reynolds Channel, improving water quality and limiting human exposure to hazardous substances.



Water Reclamation Plant, Village of Atlantic Beach

Source: VAB Building Plans Examiner

**Economic:** This infrastructure investment is critical to the short- and long-term health of the local economy. In the short term, this project would help maintain jobs associated with the operation and maintenance of the Plant. In the long term, the project would be vital to protecting the 534 primary jobs in the Community and preventing disruption to public utilities after a disaster would minimize disruption to business operations and allow residents to return home more quickly after evacuations. Long-term economic co-benefits may include reduction of local government expenditures; hardening the water reclamation plant now could reduce potential future expenditures for major infrastructure repair in the future.

Hardening the water reclamation plant fulfills part of a key regional strategy identified in the 2013 Long Island’s *The Strategic Economic Development Plan for Nassau and Suffolk Counties*.<sup>47</sup> The plan states that the hardening of “infrastructure, businesses and homes against the next major storm” is a major strategy.



**Environmental:** Hardening the Water Reclamation Plant would reduce the potential for discharge of raw or partially treated sewage or other operational failure during hazard events. These improvements would reduce the risk of contamination from wastewater flowing into floodwaters or Reynolds Channel. The discharge introduces excess nutrients such as nitrogen and phosphorus, bacteria, pathogens, and other hazardous substances into local waters. These pollutants are harmful not only to public health but also to plant and animal health in the coastal ecosystem.

watertight doors would decrease the susceptibility of these facilities to flood events. The project would deliver preventative measures to risks related to water and sewer outages (such as contamination) during storm events.

Mitigating flood risk associated with hardening of the Plant would limit the risk of human exposure to hazardous substances. Even in areas with separate public drinking water and sewer treatment systems, the drinking water supply can be contaminated during flooding events. This project mitigates that potentially severe health risk to humans.

### Anticipated Reduction of Risk Associated with the Project

This project would reduce the vulnerability of the Plant and three sanitary pumping stations, which were identified as key Community assets by the Committee and the public. Elevating backup power sources and installing

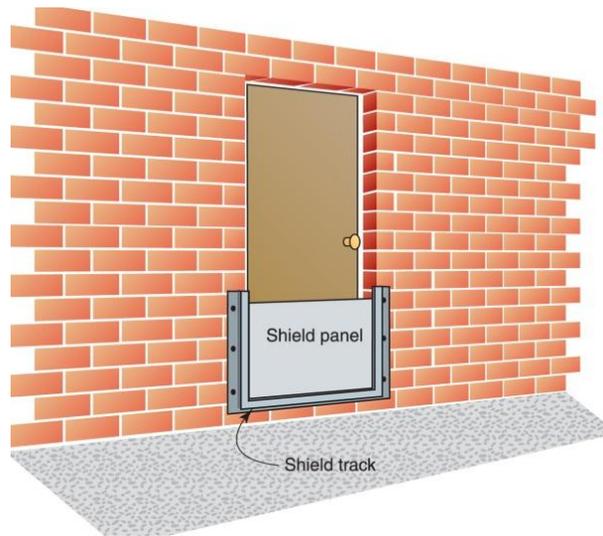
**Assets: Economic development, infrastructure, health and social services, and natural and cultural resources**  
**Population: 4,000+ (entire Community)**

<p><b>Key Project Locations:</b></p> <ol style="list-style-type: none"> <li>1 2150 Bay Boulevard</li> <li>2 Sewer Substations (three locations)</li> </ol>	<p><b>Early Action Items:</b></p> <ul style="list-style-type: none"> <li>• Obtain building permits</li> <li>• Install backup generator</li> </ul>	<p><b>Related Projects:</b></p> <ul style="list-style-type: none"> <li>• Install Backflow Preventers</li> </ul>
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## Cost-Benefit Analysis of Undertaking the Project

Hardening the Water Reclamation Plant would extend the useful life of the building. Typical water infrastructure life cycles can range from 20 years (e.g., pumps) to 50 years (e.g., treatment plants)<sup>48</sup> with regular maintenance of the facility. Maintenance costs associated with the project would be minimal and result in a reduction of exigent maintenance and repair costs during and after future storms. No negative externalities or opportunity costs have been identified.



**Watertight door**  
Source: FEMA

**General time frame for implementing actions:** This project could be completed within three months from inception.

**Local, State, and Federal government regulatory requirements related to the project, if applicable:** Regulatory requirements that would need to be addressed, if applicable, include Village of Atlantic Beach building permit regulations; Nassau County, Town of Hempstead; and all relevant local, state, and international building codes.

**Entity with jurisdiction over the project:** The GABWRD manages and operates the Plant and associated infrastructure and facilities, which are under the jurisdiction of the Village of Atlantic Beach and Atlantic Beach Estates in the Town of Hempstead, both in Nassau County.



**Watertight door**  
Source: FEMA



# Emergency Medical Services

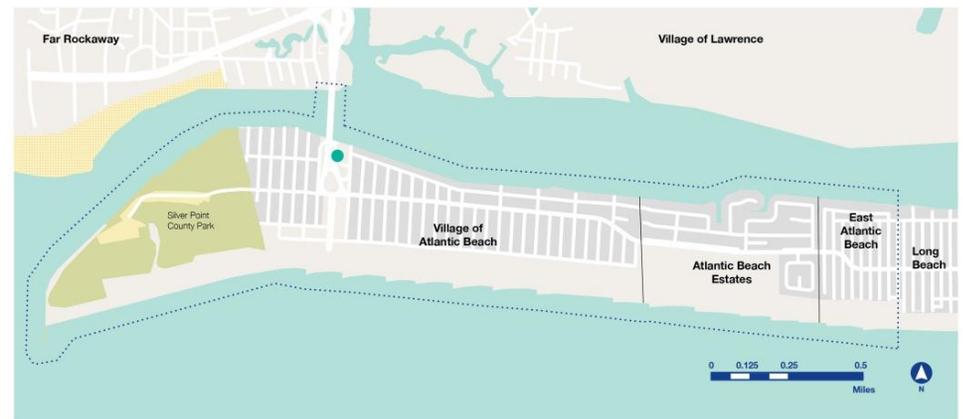
## Fortify the Existing Atlantic Beach Rescue Building

**Project description:** The Atlantic Beach Rescue (ABR) Squad is a private not-for-profit volunteer rescue unit that provides emergency medical services and water rescue services to the entire Community. The ABR Squad’s importance to the Community is underscored by the density of water-related uses that exist in Atlantic Beach and East Atlantic Beach. The Community’s location on the western tip of the Long Beach Barrier Island (Barrier Island) and its limited physical connectivity to nearby areas underscore the importance of continuous local emergency response services. Moreover, the Barrier Island’s only hospital, Long Beach Medical Center, was destroyed by Sandy and remains closed, placing a further premium on ready access to lifesaving and emergency services.

Because of the breadth and importance of the services provided by the Squad, the Committee identified the Rescue Building as a key asset from the outset of the planning process. The building is susceptible to the same sustained power outages that affect the rest of the Community during hazard events.

The Emergency Medical Services project would protect and fortify the existing Atlantic Beach Rescue Building by installing solar panels, relocating and providing redundant backup generators to a higher elevation, installing a hard-wired interoperable communication system in

## Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach



● Emergency Medical Services Project Location

Source: TwoTwelve

redundant locations, and placing new dock pilings for the squad’s rescue boat. The project would strengthen ABR Squad’s ability to provide uninterrupted emergency response during normal conditions and acute events.



### Cost Estimate

\$460,000



### Timeline

6 months





**Short description:** Protect and fortify the existing Atlantic Beach Rescue Building through improved infrastructure and communication systems.

**Project cost:** \$460,000. This cost projection assumes that structural modifications to the mezzanine level of the Rescue building would be necessary to effect the improvements described above.

### Benefit or Co-Benefits to Be Derived from the Project

**Health and Social:** The Atlantic Beach Rescue Squad provides vital emergency response and lifesaving services to the entire Community. The squad’s ability to provide continuous service is of vital importance to all Community residents, particularly socially vulnerable populations, which include the 25% of Community residents who are 65 or older and 6% of residents with a disability. The number of residents between the age of 65 and 74 is projected to grow by more than 30% by 2020. As the Community’s population continues to age, protection and fortification of existing emergency medical services, including fire and police protection, will only become more important.

**Economic:** Enhanced protection of the Rescue building would confer significant indirect economic benefits on the Community. Atlantic Beach Rescue’s improved ability to offer critical services on a continuous basis would minimize the frequency and severity of emergency events that can

cause significant dollar loss and depress localized property values. The availability of a dedicated, all-volunteer nonprofit provider of rescue services is a significant asset because it minimizes the need for public expenditures for these services. In addition, the availability of quality public services, including emergency response, can serve as an inducement to residents and businesses to remain in, or relocate to, a given area.

### Anticipated Reduction of Risk Associated with the Project

This project would reduce the vulnerability of the Atlantic Beach Rescue building. Elevation of building mechanicals and provision of redundant power supply would greatly limit the building’s susceptibility to sustained power outage. Enhancement of building communication systems is equally important to ensure the squad’s ability to function and provide its full suite of services following emergency events.

**Assets: Economic development, infrastructure, and health and social services**

**Population: 4,000+ (entire Community)**

<p><b>Key Project Locations:</b></p> <ul style="list-style-type: none"> <li>1 Atlantic Beach Rescue</li> </ul>	<p><b>Early Action Items:</b></p> <ul style="list-style-type: none"> <li>• Obtain building permits</li> </ul>	<p><b>Related Projects:</b></p> <ul style="list-style-type: none"> <li>• Village of Atlantic Beach Community Assistance Center</li> <li>• Microgrid Power System</li> </ul>
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The project would also significantly reduce risk to the population. Access to lifesaving and emergency services was limited even before the destruction of the Long Beach Medical Center. During Superstorm Sandy, Community residents reported having inadequate access to and communication with emergency and fire services. By supporting the ABR Squad’s ability to function during and after hazard events, this project would confer significant benefits to all Community residents, particularly to socially vulnerable individuals.

### Cost-Benefit Analysis of Undertaking the Project

This project would extend the useful life of the existing building by increasing its resistance to wind and flooding damage in future storm events. The strengthening of emergency medical services would provide tangible, sustainable benefits to the community and socially vulnerable populations throughout the life of the emergency facilities. Long-term costs associated with bolstering the emergency services would be minimal and relate to routine building maintenance and upkeep.

The objectives of this project could potentially be accomplished through other means, including enhanced coordination with regional emergency service providers or establishment of mobile medical services. Enhancement of existing services at existing facilities would be a more cost-efficient and durable means of ensuring continuous, effective emergency response services in the Community. The ABR Squad performs its rescue services on a volunteer basis, Nassau County, the Village, and the Town of Hempstead all derive substantial benefit from the reduced need for public expenditures on emergency response services.

**General time frame for implementing actions:** This project could be completed within six months of inception.

**Local, State and federal government regulatory requirements related to the project, if applicable:** Submission of an application to obtain a Village of Atlantic Beach building permit.

**Entity with jurisdiction over the project:** The project services the Community. Jurisdiction over the project includes the Village of Atlantic Beach.



**Existing Rescue facility, Village of Atlantic Beach**  
Source: LiRo



**Example of rooftop solar panels**  
Source: Creative Commons Flickr





# Complete Streets/Drainage along Beech Street

ABE EAB

## Use Complete Streets Design Considerations to Provide Drainage and Street Improvements for Major Thoroughfare

**Project description:** Beech Street (signed as Nassau County Road 22) form a primary transportation corridor that links the Barrier Island from the Atlantic Beach Bridge to the City of Long Beach and designated County evacuation routes. Intersections along the route are prone to flooding. This project would provide phased drainage and street improvements along emergency evacuation routes, specifically along the 0.91-mile stretch of Beech Street between Yates and Nevada Avenues and other local flood-prone areas.

The project would include an evaluation of existing facilities to assess their conformance with stormwater best management practices. The analysis would include an examination of existing road section grades and cross sections to assess the suitability of green infrastructure. Based on this list, a prioritized list of improvements would be developed that may include implementation of discharge or recharge structures under parking lanes or sidewalks, construction of rain gardens, installation of permeable pavements, or installation of piping and collection systems.

Atlantic Beach Estates/East Atlantic Beach



Complete Streets/Drainage along Beech Street Project Location  
Source: TwoTwelve

**\$ Cost Estimate**  
\$5,500,000

**🕒 Timeline**  
14 months



Additional potential improvements include enhanced streetscape elements with curbs, continuous sidewalks and refuge areas to provide connectivity for motorists, bicyclists, and pedestrians and to promote these non-motorized uses. The project would also include upgrading existing facilities to comply with the Americans with Disabilities Act (ADA) and to enhance traffic, bicyclist, and pedestrian safety, including pedestrian signals, high-visibility crosswalks, and traffic signing and striping.

**Short description:** Use Complete Streets to provide phased drainage and street improvements along emergency evacuation routes through stormwater best management practices, infrastructure improvements, and traffic safety and management measures.

**Project cost:** \$5,500,000. This estimate encompasses implementation costs for the first 0.4 mile of phased roadway and drainage improvements and mitigations along the 0.91-mile corridor.

### Benefit or Co-Benefits to Be Derived from the Project

**Health and Social:** This project promotes compliance with the 2011 NYS Complete Streets Act,<sup>49</sup> which was designed to ensure that residents are able to “achieve the health benefits associated with active forms of transportation.” Throughout the planning process, the Committee expressed concern about safety issues along the corridor, citing regular accidents and near misses involving pedestrians. The City of Long Beach is also seeking funding to implement Complete Streets including a portion of Beech Street. Coordination would provide an opportunity to establish a network of Complete Streets.

**Economic:** This project may reduce local, Town, and County government expenditures by providing more efficient access to evacuation routes,

improving stormwater and drainage infrastructure capacities, and increasing safety at dangerous intersections and corridors. In addition, using bioswales or other green stormwater infrastructure would reduce the demand on existing hard drainage facilities. The stormwater and drainage improvements would also reduce risk to properties and assets in these areas from flooding. The Complete Streets project may indirectly promote economic vibrancy of the community and promote higher property values in the vicinity of the project corridor.

The Complete Streets project supports the 2013CGLI Plan Transportation Strategy, which is “Improve safety of streets for pedestrians and cyclists through implementation of Complete Streets, signal optimization, and a comprehensive bike plan.” The CGLI also notes that “inland, more frequent and intense rainfall events could also cause travel disruptions due to flooded intersections, roadways and rail lines, impacts that would be mitigated by this project.”<sup>50</sup>

**Environmental:** This project would improve coastal water quality by reducing runoff into Reynolds Channel. Bioswales and green infrastructure would provide small informal open spaces, increase the amount of permeable surfaces, and allow for natural groundwater recharge.

**Assets:** Economic development, infrastructure, health and social services, natural and cultural resources

**Population:** 4,000+ (entire Community)

**Key Project Locations:**

- 1 Beech Street

**Early Action Items:**

- Obtain building permits to assess existing facilities to assess conformance with stormwater practices

**Related Projects:**

- Stormwater System Improvements
- Solar-Powered Street Lights
- Underground Utilities Feasibility Study





## Anticipated Reduction of Risk Associated with the Project

Implementing the Complete Streets project along Beech Street would result in a slight reduction of risk to critical assets including a sewer substation and the water treatment plant because of the potential mitigation of nuisance and low-volume flooding during recurring storm events. Primary reductions are a reduction in risks associated with flooding and traffic safety concerns along this primary route, which serves as the major transportation corridor that connects with county-designated evacuation routes, and risks associated with flooding to residences and businesses.

The Committee advocated strongly for including safety improvements in this project. This goal is complementary to the objective of promoting better stormwater and drainage management and resulting improvements to coastal water quality. Despite relatively limited pedestrian activity in the project area, a 2003 report by the Nassau County Department of Health documented at least five instances of traffic accidents requiring pedestrian hospitalization in the Community in the preceding decade.<sup>51</sup> This project would improve safety conditions for all road users.

## Cost-Benefit Analysis of Undertaking the Project

The Complete Streets project would provide long-term benefits to the useful life of the streetscape and indirect benefits to the economic vibrancy of the community and improved safety for the community.

Negative externalities of the project are related primarily to the long-term cost and potential upkeep (financial and labor) the Community would potentially incur. Opportunity costs are minimal because the Complete Streets project encompasses a diverse range of alternatives originally considered when addressing what the project aims to achieve: safety, flood reduction, and long-term economic and community vibrancy.

**General time frame for implementing actions:** The project involves multiple assessment and implementation phases. Additional work beyond the steps included in the Project Description above could be added to the project scope pending the availability of additional funds. As described above, it would take approximately 14 months to complete this project.

**Local, State, and Federal government regulatory requirements related to the project, if applicable:** Regulatory requirements that would need to be addressed, if applicable, include Nassau County, and Town of Hempstead building permits. Coordination with local utility companies would be required to address potential jurisdictional and operational issues.

**Entity with jurisdiction over the project:** The project is located in East Atlantic Beach in the Town of Hempstead. Subsequent project phases could extend into the Village of Atlantic Beach.





**Existing conditions along Beech Street, East Atlantic Beach**  
Source: Google Earth



**Visualization of Complete Street implementation along Beech Street, East Atlantic Beach**  
Source: URS



# Solar-Powered Street Lights

## Provide LED Street Lights along Major Thoroughfares

**Project description:** Power outages during emergency events are a significant problem throughout the Barrier Island, particularly within the Community. Blackouts and outages affect the ability of residents to safely walk or drive to their homes, evacuate to emergency shelters, access critical medical services or obtain basic supplies. Many traditional streetlight electrical systems and connections were damaged or destroyed by Superstorm Sandy and required repair or replacement. Committee members and attendees at Public engagement Events reported that public safety was compromised by streetlight outages and encouraged trespassing and looting.

Solar-powered street lights that use stored energy from the sun instead of electricity can provide lighting in critical locations during power outages and help retain vital street lighting post-storm that could otherwise be lost.

The Solar-Powered Street Lights project involves funding light-emitting diode (LED) solar-powered lights to be located along Beech Streets, Ocean and Bay Boulevards, and other side streets throughout the Community. Beech Street and Ocean and Bay Boulevards comprise the major access route within the Community. These roads provide direct access to the Atlantic Beach Bridge and the City of Long Beach and are essential components of the evacuation network.

Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach



— Solar-Powered Street Lights Project Location  
Source: TwoTwelve



### Cost Estimate

\$1,300,000



### Timeline

6 months





**Short description:** Provide light-emitting diode (LED) street lighting that is solar-powered to prevent loss of lighting in the event of power.

**Project cost:** \$1,300,000. The cost estimate assumes installation of 180 units across the Community.

### Benefit or Co-Benefits to Be Derived from the Project

**Health and social:** Improved street lighting to the main thoroughfare that leads to the county-designated emergency evacuation route can enhance safety and accessibility to essential health and social services during and after acute hazard events, including storms and floods. This project would benefit all Community residents, including individuals with access and functional needs for whom access to social or emergency services may be of critical importance.

**Economic:** Solar-powered lighting would reduce local government utility costs and would also likely reduce local government expenditures by providing emergency lighting during power outages, resulting in a net decrease in costs potentially incurred by the Community as a result of reduced potential accidents from improved safety.

**Environmental:** Solar street lighting reduces demand on power generation and transmission networks while also limiting greenhouse gas emissions. The

project is therefore consistent with Nassau County’s goal as a signer of the Cool Counties Climate Stabilization Declaration to reduce emissions by 80% by 2050.

### Anticipated Reduction of Risk Associated with the Project

Installation of solar-powered street lights would improve pedestrian and motorist safety, especially during power outages and other acute events, resulting in a reduction of risk to two critical assets—a sewer substation and the Water Reclamation Treatment Plant—and result in a cumulative risk reduction to the Community as a whole. Solar-powered lighting during power outages would also improve residents’ safety and security during stressful post-storm periods by ensuring improved visibility on roadways and would help residents feel more safe and secure.

**Assets:** Health and social services, infrastructure

**Population:** 4,000+ (entire Community)

#### Key Project Locations:

- 1 Beech Street
- 2 Park Street
- 3 Ocean and Bay Boulevards

#### Early Action Items:

- Obtain building permits
- Coordinate with applicable utility companies

#### Related Projects:

- Complete Streets/Drainage Improvements along Beech Street
- Microgrid Power System





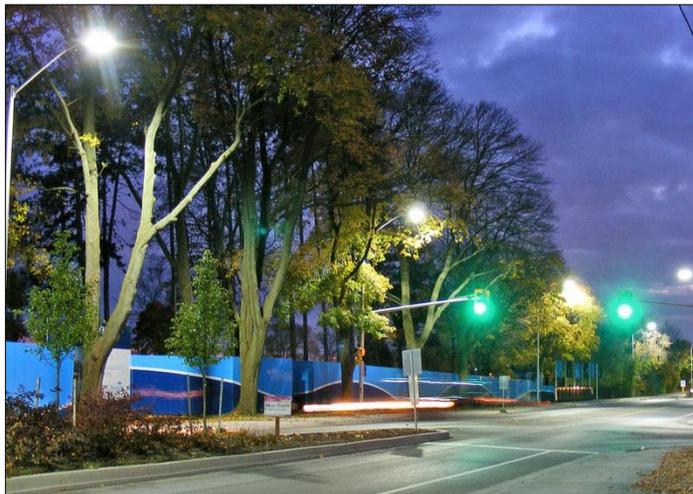
### Cost-Benefit Analysis of Undertaking the Project

Solar-powered street lights have an extended useful life with sustained benefits before, during, and after potential storm events. Upfront purchase and installation costs are higher, and more street lights are needed to provide standardized luminosity. However, long-term maintenance costs associated with street lighting are minimized for solar-powered street lighting due to the life of LED lamps. Given the safety risks associated with prolonged streetlight outage and the Committee’s strong desire for continuous lighting, the benefits of this project would justify the expenditures.

**General time frame for implementing actions:** This project should take approximately six months to complete.

**Local, State, and Federal government regulatory requirements related to the project, if applicable:** Regulatory requirements that will need to be addressed are the applicable Village of Atlantic Beach, Town of Hempstead, and Nassau County building permit reviews. Coordination with local utility companies would be required to address potential jurisdictional and operational issues.

**Entity with jurisdiction over the project:** The roads within the project area are under the jurisdiction of Nassau County, the Town of Hempstead, and the Village of Atlantic Beach. Coordination with local utility companies would be required to address potential jurisdictional and operational issues.



**LED street lights**  
Source: Creative Commons Flickr



**LED street lights lamp housing**  
Source: Creative Commons Flick

# Village of Atlantic Beach Community Assistance Center



VAB

## Retrofit the Tennis Center to Be Used as a Community Assistance Center in the Village of Atlantic Beach

**Project description:** Throughout the planning process, the Village of Atlantic Beach staff and Committee members identified a strong need for additional public space for post-disaster response and outreach services. The Atlantic Beach Village Hall (Village Hall) avoided major flooding damage because of extensive sandbagging before the storm. The building was stretched beyond capacity after the storm, however, when multiple agencies used the building as a staging center. Committee members identified the Tennis Center, which is located across the street from Village Hall, as an underused public facility with the capacity to serve as a Community Assistance Center following disasters.

Personnel from the Village Department of Public Works stated that improvements to the Tennis Center physical plant would also include stormwater detention upgrades that would significantly improve the ability of the local area to absorb stormwater and mitigate nuisance flooding during regular storm events. According to Village personnel, local demand for tennis facilities could be accommodated comfortably, even if six of the 13 courts were removed. The Village's Public Works Department has proposed stormwater and drainage improvements that would be implemented if some of the courts were removed. Removal of the courts would not compromise public recreational opportunities and would offer an opportunity to upgrade local infrastructure in a manner consistent with the Village's recent improvements to drainage systems.

## Village of Atlantic Beach



● Atlantic Beach Village Hall Project Location

Source: TwoTwelve



### Cost Estimate

\$2,000,000



### Timeline

6 months





The Center suffered relatively superficial building damage during Sandy. High winds stripped siding from the building and broke windows in the building’s skylight system. In large measure, though, the building’s vulnerability is a function of its susceptibility to sustained power outages.

The Village of Atlantic Beach Community Assistance Center project would retrofit the existing Village-owned Tennis Center building to create a Community Assistance Center for post-emergency assistance. Building upgrades would include installing solar panels and a backup generator to allow the Center to function during local power outages. The project would also remove six of the 13 tennis courts and install an underground drainage detention type structure for stormwater runoff. Improvements would incorporate active and passive recreational elements including a playground, basketball courts, tables, benches, space for entertainment, landscaping, and walkways with activity stations over the removed tennis courts.

**Short description:** Retrofit the Tennis Center in the Village of Atlantic Beach to be used as a Community Assistance Center, including improvements to drainage and the incorporation of active and passive recreational elements.

**Project cost:** \$2,000,000. This estimate provides for structural and architectural modifications to be implemented over 50% of the existing building. It also includes incorporation of stormwater detention facilities under the tennis court.

**Benefit or Co-Benefits to Be Derived from the Project**

**Health and Social:** This project would promote more efficient dissemination of vital services and information in the aftermath of storm and other critical events. More emergency response personnel would be able to use Village facilities more effectively to provide supplies, relevant information, and other critical services to Community residents. Project benefits would be most keenly felt by socially vulnerable populations, including the elderly and those with access and functional needs, whose reliance on accessible public services and information in post-hazard situations is greatest. Superstorm Sandy caused greater than 50% damage to nearly 700 housing units the Community, including 174 within the Village itself. In addition, 22% of FEMA registrants in the Community reported household incomes of less than \$30,000. Displaced and low-income residents are among the populations that would benefit from this project.

As a secondary benefit, the project would provide more general-purpose open and recreational space for public use. The loss of tennis courts would be mitigated by the proposed installation of new active and passive recreational infrastructure.

**Assets: Health and social services, infrastructure**  
**Population: 1,900 (Village of Atlantic Beach)**

<p><b>Key Project Locations:</b></p> <ul style="list-style-type: none"> <li>1 Atlantic Beach Tennis Center</li> </ul>	<p><b>Early Action Items:</b></p> <ul style="list-style-type: none"> <li>• Issue Request for Proposal</li> </ul>	<p><b>Related Projects:</b></p> <ul style="list-style-type: none"> <li>• Village Hall</li> <li>• Microgrid power systems</li> <li>• Create storm floodwater catch basins</li> </ul>
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**Economic:** The Village of Atlantic Beach currently lacks a designated Community Assistance Center. Providing emergency and recovery services after storm events can reduce governmental costs by centralizing emergency

efforts. Indirectly, more efficient delivery of services and information in a post-disaster setting can be useful in restoring and maintaining local resident confidence and a desire to remain in the community.



**Environmental:** This project would increase the absorptive capacity of approximately 1 acre area north of the Tennis Center building. Reduction of impermeable surfaces and installation of improved drainage infrastructure would reduce stormwater runoff and reduce the frequency and severity of nuisance flooding in the immediate area.

Establishment of the Community Assistance Center would improve the efficiency of cleanup operations related to flooding and associated contamination. The center would also disseminate information to help prevent secondary impacts from related events such as fires.

### Anticipated Reduction of Risk Associated with the Project

This project would result in the reduction of risk through providing central Community Assistance Center that can offer information, supplies, and other services to assist residents and businesses during storm events. The stormwater drainage improvements would reduce the risk of flooding to the Community. The entire Village of Atlantic Beach would be served.

### Cost-Benefit Analysis of Undertaking the Project

The project's useful life is tied to the useful life of the Tennis Center building. Additional maintenance would be required to ensure the operation and efficiency of new drainage and stormwater attenuation infrastructure. Maintenance costs would be relatively minimal. Any necessary maintenance and upkeep work could be performed by the Department of Public Works.

In light of these cost considerations and given strong public input that additional public space for community assistance and post-disaster

operations coordination is a vital need; the anticipated expenditure of \$2,000,000 to implement this project is justified. The project would provide a broad range of social and environmental benefits.

**General time frame for implementing actions:** This project should take approximately six months to complete.

**Local, State, and Federal government regulatory requirements related to the project, if applicable:** No permits are required for Village-owned property.

**Entity with jurisdiction over the project:** The project is located in the Village of Atlantic Beach in Nassau County.



Example of rooftop solar panels  
Source: Creative Commons Flickr





**Tennis Center, Village of Atlantic Beach**  
Source: VAB Building Plans Examiner



**Example of a backup generator**  
Source: Creative Commons Flickr



# East Atlantic Beach Community Assistance Center Feasibility Study



ABE EAB

## Create a Community Assistance Center in East Atlantic Beach

**Project description:** The Committee was concerned about a lack of existing formal space in East Atlantic Beach and Atlantic Beach Estates for public gathering and community assistance coordination in post-disaster situations. Committee members reported that after Sandy, residents in these areas lacked access to information and necessary supplies. Because the Community is in the floodplain and because most of the land in East Atlantic Beach is privately owned and developed, there are a limited number of locations where a Community Assistance Center could be developed. Every potential location has advantages and disadvantages.

The East Atlantic Beach Community Assistance Center Feasibility Study project would consist of a feasibility study to assess potential locations for a Community Assistance Center in East Atlantic Beach, including the Troy Beach House and a park location on Scott Drive. The feasibility study would consider the condition of existing facilities and potential regulatory and structural issues associated with conversion of potential sites for eventual use as a Community Assistance Center.

**Short description:** Evaluate and identify a location for a Community Assistance Center in East Atlantic Beach for Atlantic Beach Estates and East Atlantic Beach.

**Project cost:** \$50,000

Atlantic Beach Estates/East Atlantic Beach



 East Atlantic Beach Community Assistance Center Feasibility Study Location

Source: TwoTwelve



### Cost Estimate

\$50,000



### Timeline

6 months





## Benefit or Co-benefits to be Derived from the Project

**Health and Social:** As with the proposed Village Community Assistance Center, this project would promote increased and more efficient dissemination of vital services and information in the aftermath of a storm and other acute events. Project benefits would be most keenly felt by socially vulnerable populations, including the elderly and those with access and functional needs whose reliance on accessible public services and information in post-hazard situations is greatest. Sandy caused more than 50% damage to nearly 700 housing units in the Community, including 510 in East Atlantic Beach. In addition, 23% of FEMA registrants in East Atlantic Beach reported household incomes of less than \$30,000. Displaced and moderate to low income residents are among the populations that would benefit from the project.

**Economic:** East Atlantic Beach does not currently have a designated Community Assistance Center.

**Environmental:** Establishment of the Community Assistance Center would improve the efficiency of cleanup operations related to flooding and associated contamination. The center would also disseminate information to help prevent secondary impacts from disaster events such as building fires.

## Anticipated Reduction of Risk Associated with the Project

This project would result in the reduction of risk by providing an assessment of a Community Assistance Center that could offer information, supplies, and other services to assist residences and businesses during storm events.

**Assets: Health and social services, infrastructure**  
**Population: 2,000 (East Atlantic Beach)**

<p><b>Key Project Locations:</b></p> <ul style="list-style-type: none"> <li>1 East Atlantic Beach</li> </ul>	<p><b>Early Action Items:</b></p> <ul style="list-style-type: none"> <li>• Issue Request for Proposal</li> </ul>	<p><b>Related Projects:</b></p> <ul style="list-style-type: none"> <li>• Emergency Medical Services</li> <li>• Microgrid Power System</li> </ul>
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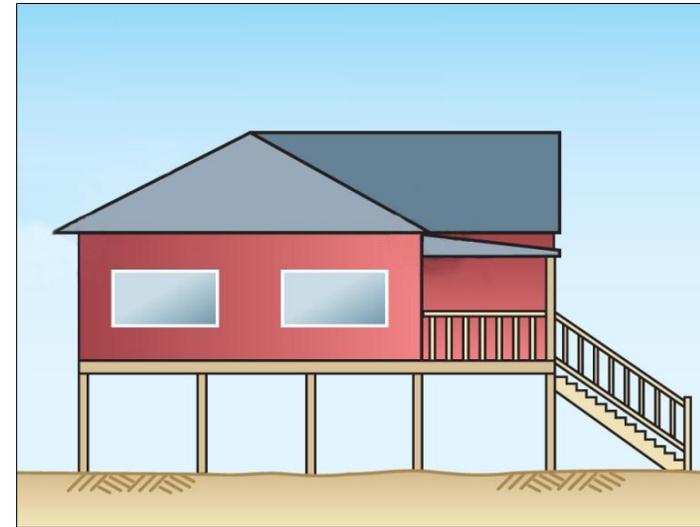
## Cost-Benefit Analysis of Undertaking the Project

The minimal cost associated with a study is justifiable given observed issues with post-disaster service coordination and information dissemination following Superstorm Sandy. The feasibility study would provide valuable information about various sites' potential to serve as a Community Assistance Center and would likely result in findings applicable to more generalized emergency preparedness and response planning in the Community.

**General time frame for implementing actions:** This project would take approximately six months to complete from inception.

**Local, State, and Federal government regulatory requirements related to the project, if applicable:** The feasibility study would determine the feasibility of the Community Assistance Center. Coordination with the Town of Hempstead is needed.

**Entity with jurisdiction over the project:** The project is located in East Atlantic Beach, under the jurisdiction of the Town of Hempstead in Nassau County.



**Elevated Community Assistance Center**

Source: FEMA





# Install Backflow Preventers

## Install Backflow Preventers and Storm Drain Covers to Mitigate Flooding and Prevent Drain Blockage

**Project description:** According to the U.S. Geological Survey tide mapping information, water levels reached three feet above ground level along Ocean Boulevard and six inches above ground level as far inland as Beech Street in East Atlantic Beach during Superstorm Sandy. During events like Sandy that cause unusually high tides, stormwater outfalls that typically drain into Reynolds Channel tend to backflow with seawater. The backflow exacerbates flooding and associated damage. Even more frequent heavy rain events can cause localized flooding whose effects are magnified by drainage issues.

Based on the results of its 2009 Coastal Protection Study,<sup>52</sup> the adjacent City of Long Beach has initiated a program of installing backflow preventers on outfalls and other flood mitigation measures. In addition to the protection that these devices provide against water damage, effective backflow prevention systems can reduce risks to public health posed by flooding of building interiors. These risks include cross contamination from comingled sewage or other pollutants.

Because the Community shares topographical characteristics with Long Beach and because the Community is equally susceptible to flooding, a similar program to install backflow prevention devices is proposed for the Community. The project would install backflow preventers in Atlantic Beach Estates and East Atlantic Beach on storm sewer outlets. Steel storm drain covers would also be procured and installed throughout the entire Community to prevent debris from entering drains prior to storm events.

Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach



- Install Storm Drain Covers Project Location
- Install Backflow Preventers Project Location

Source: TwoTwelve



### Cost Estimate

\$360,000



### Timeline

Six months





**Short description:** Install backflow preventers and storm drain covers throughout the Community to mitigate flooding and prevent debris from entering drains.

**Project cost:** \$360,000. This figure assumes installation of 10 upland outfall chambers in East Atlantic Beach Atlantic Beach Estates and installation of steel storm drain covers throughout the Community, including in the Village of Atlantic Beach.

**Benefit or Co-benefits to Be Derived from the Project**

**Health and Social:** As noted in the project description above, the project would reduce flooding associated with seawater backflow. To the extent that homes are also protected from storm surge flood damage, the project would provide additional benefit to homeowners and other residents. Based on the income profile of FEMA registrants in the Community following Sandy, approximately 25% of the project’s beneficiaries would be from households with an annual income of less than \$30,000.

**Economic:** According to FEMA registrations, Superstorm Sandy caused more than \$8 million of damage to residences in the Village of Atlantic Beach and East Atlantic Beach. Each housing unit that is spared significant damage in future severe storm events by this project would represent a direct cost

savings of approximately \$8,500. Equally as important, a reduction of flood damage associated with this project would limit residential displacement following storm and flooding events.

Regionally, the project would help support the goals in the April 2013 CGLI Plan<sup>53</sup> Adaptation to Climate Change, where “inland, more frequent and intense rainfall events could also cause travel disruptions due to flooded intersections, roadways and rail lines.” This project would help reduce these potential impacts. This project is also a response to the Strategic Economic Development Plan for Nassau and Suffolk Counties<sup>54</sup> Goal 4 under the “Water” category to “control flooding and surface water pollution from stormwater runoff.”

**Environmental:** During Superstorm Sandy, debris that entered and blocked drains caused severe flooding throughout the Community. This project would reduce contaminated stormwater runoff and flooding from impermeable surfaces and residential structures flowing into Reynolds Channel.

**Assets: Infrastructure**  
**Population: 4,000+ (entire Community)**

<p><b>Key Project Locations:</b></p> <ul style="list-style-type: none"> <li>1 Community-wide</li> </ul>	<p><b>Early Action Items:</b></p> <ul style="list-style-type: none"> <li>• Obtain applicable permits</li> <li>• Review compliance with the New York State Department of State and the New York Department of Environmental Conservation</li> </ul>	<p><b>Related Projects:</b></p> <ul style="list-style-type: none"> <li>• Harden Water Reclamation Plant</li> <li>• Complete Streets/Drainage Improvements along Beech Street</li> </ul>
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## Anticipated Reduction of Risk Associated with the Project

This project would reduce risk to approximately 20 assets throughout the Community by minimizing interference with existing stormwater systems and limiting the potential for the stormwater conveyance system to be clogged by sand or other debris. Further spatial analysis is required to finalize the list of locations most in need of improvement. When the analysis is complete, more precise quantification of the reduction of risk to assets would be possible.

Floodwater and stormwater backflow into buildings creates health hazards for building occupants. Residents would benefit from reduced exposure to these hazards and from reduced flooding risk associated with backflow.

## Cost-Benefit Analysis of Undertaking the Project

The project useful life would be limited to the effective life of backflow prevention devices, which is projected to be 30 years. Maintenance and replacement of individual components, as needed, would be required to keep backflow prevention systems operating. The useful life can be extended indefinitely through maintenance and ongoing replacement of individual valves and devices. If the project is not implemented, the Community would remain vulnerable to backflow inundation during and after acute storm and flooding events. Because the project would confer significant benefits to the Community and reduce risk to a large number of physical assets, the Committee supports the anticipated expenditure of \$360,000 to install backflow prevention devices.

**General time frame for implementing actions:** This project would take approximately six months to complete.



**Backflow Preventer at Ohio Avenue, City of Long Beach**  
Source: Building Plans Examiner

**Local, State, and Federal government regulatory requirements related to the project, if applicable:** Regulatory requirements are the applicable Town of Hempstead and Nassau County building permits and the New York State Department of Health Guidelines for Designing Backflow Prevention Assembly Installations and Cross-Connection Control Program.

**Entity with jurisdiction over the project:** The project services the Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach. Jurisdiction over the project includes the Village of Atlantic Beach and the Town of Hempstead, both in Nassau County.



# Assess Feasibility and Economic Impact of Perimeter Dune System



VAB ABE EAB

## Conduct a Study to Determine the Feasibility of a Dune Perimeter System

**Project description:** During the 1990s, the Community opted out of the U.S. Army Corps of Engineers feasibility studies related to potential dune construction and flood mitigation, citing unwillingness to compromise resident-only beach access. The Village of Atlantic Beach and East Atlantic Beach also both determined at that time that the economic cost associated with limiting beach views was too great to compensate for the risk reduction benefits associated with dune construction. In particular, owners of the Community's beach clubs, which are the primary Community economic assets, expressed concern that dune construction would undermine the viability of their business model.

The widespread damage associated with Superstorm Sandy prompted the Committee to reexamine the earlier positions. Although Public Engagement Event attendees joined the Committee in expressing that resident-only beach access must not be compromised, the Community stated a desire to re-examine the issue of dune construction.

The Assess Feasibility and Economic Impact of Perimeter Dune System project entails a feasibility study to evaluate the impacts of a perimeter dune system on the economic viability of the oceanfront beach clubs. More specifically, the study would examine the economic and infrastructural impacts of a development scenario that includes the re-establishment of a dune system and envisions the gradual closure of beach clubs and their replacement with single-family homes.

## Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach



■ Perimeter Dune Feasibility Study Project Location

Source: TwoTwelve

The technical feasibility and economic impact study would consider the economic and environmental impacts of the perimeter dune system. The study would also consider impacts on traffic patterns and demand for public infrastructure and utilities. Although the technical feasibility of new dune construction is generally understood, this study could play a significant role in inspiring a long-range planning and development framework better oriented to the long-term sustainability and prosperity of the Community.



### Cost Estimate

\$500,000



### Timeline

6 months





**Short description:** Study the cost-effectiveness and technical feasibility of a dune perimeter system on beach clubs including benefits and risks.

**Project Cost** \$500,000

**Benefit or Co-Benefits to be Derived from the Project**

**Economic:** A primary result of the study would be quantification of economic impacts of a dune system on oceanfront the beach club. The study would calculate the direct benefits and costs in the form of anticipated property tax receipts. The study would also examine the impacts on demand for services and the direct and indirect impacts of privately financed dune construction to individual beach clubs whose owners may choose to pursue this option in lieu of selling their property for residential redevelopment.

Regionally, a dune perimeter system addresses a key strategy in the 2013 Long Island *Strategic Economic Development Plan for Nassau and Suffolk Counties*<sup>55</sup> “to harden our infrastructure, businesses and homes against the next major storm.

**Environmental:** A perimeter dune system would have obvious environmental benefits, including protection of habitat and open space and the potential to minimize harm to the piping plover and important or protected vegetation. The perimeter dune system would also serve as a

barrier to storm surge, reducing potential flooding and overflow that could result in contamination from buildings and stormwater runoff.

In the nearer term, the study would describe the environmental impacts associated with the redevelopment scenario described here.

**Anticipated Reduction of Risk Associated with the Project**

The study itself would not reduce risk to physical assets or to the population. An eventual perimeter dune system would, however, substantially reduce risk during future storm events, particularly severe storm surges. All Community assets would experience reduction in vulnerability and risk scores and especially the assets on the oceanfront of the Barrier Island that are exposed to storm surge and wave action. Residential structures and key facilities including the Tennis Center and the Troy Beach House in East Atlantic Beach would be among the primary beneficiaries of a perimeter dune system.

**Assets: Economic development, infrastructure, natural and cultural resources**  
**Population: 4,000+ (entire Community)**

Key Project Locations:	Early Action Items:	Related Projects:
<p><b>1</b> Beach Clubs</p>	<ul style="list-style-type: none"> <li>• Begin consultation with the U.S. Army Corps of Engineers</li> <li>• Form a committee to initiate the study</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>



### Cost-Benefit Analysis of Undertaking the Project

The study would address and provide answers to many planning questions raised by the Committee and members of the public during the planning process. The project expenditure of \$500,000 is justifiable in this light, particularly if it identifies viable means of protecting community character and resident-only beach access while moving toward completion of a barrier island-wide perimeter dune system. The project expenditure is particularly worthwhile in view of the benefits that neighboring communities would derive from dune construction in Atlantic Beach and East Atlantic Beach.



**Coastal dune stabilized by beachgrass**  
Source: Creative Commons Flickr

**General time frame for implementing actions:** A feasibility and economic impact study of this magnitude would take approximately six months to complete.

**Local, State, and Federal government regulatory requirements related to the project, if applicable:** No permits are required for a feasibility study. The U.S. Army Corps of Engineers would be consulted.

**Entity with jurisdiction over the project:** The project services the Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach. Jurisdiction over the project includes the Village of Atlantic Beach and the Town of Hempstead, both in Nassau County.



**Dune grass plantings along the oceanfront of the Community**  
Source: Kate Murray, Town of Hempstead Supervisor





# Atlantic Beach Village Hall

VAB

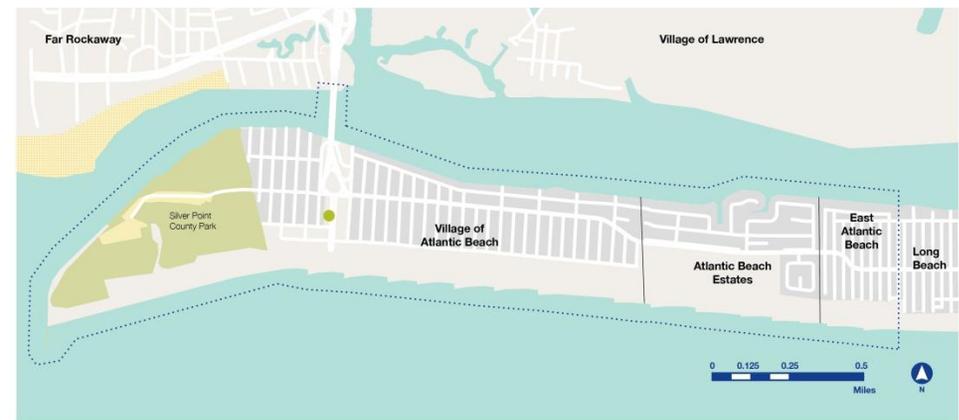
## Modify Atlantic Beach Village Hall for Continuity of Operations during and after Storm Events

**Project description:** Superstorm Sandy and the response operations that followed the storm placed considerable strain on Atlantic Beach Village Hall. As described above, the building was fortunate to avoid major damage thanks to extensive sandbagging by the Department of Public Works personnel. Such labor-intensive protection methods are an inefficient means of protecting vital records and ensuring continuity of Village operations after future disasters. From the outset of the planning process, the Committee identified durable protection of Village Hall as a key infrastructure need. The Committee’s strategy to identify and implement site-specific upgrades to protect key infrastructure was drafted with Village Hall in mind. Following the storm, Village staff identified targeted improvements that could be made to the Village Hall building to safeguard it against future storms and disaster events.

The project entails structural upgrades and modifications to Village Hall to maintain continuity of operations and to protect vital records during and after major storms. These improvements include installation of solar panels, communication systems, and a generator.

**Short description:** Provide upgrades and protection to Atlantic Beach Village Hall to maintain continuity of operations and protect vital records during and after storm events.

Village of Atlantic Beach



● Atlantic Beach Village Hall Project Location

Source: TwoTwelve



### Cost Estimate

\$400,000



### Timeline

3 months





**Project cost:** \$400,000

### Benefit or Co-Benefits to Be Derived from the Project

**Health and Social:** Hardening Village Hall would provide continuity of government operations during and after acute hazard events. All Village residents would benefit from the availability of essential services and provisions and from the building’s reinforced capacity to serve as a hub for response operations and information diffusion. Project beneficiaries include individuals with disabilities, senior citizens, and individuals with low or moderate income.

**Economic:** Hardening this key piece of infrastructure would protect government operations and allow the Village to recover more swiftly from storm events. By limiting time spent in re-establishing government functions, disaster recovery efforts can be directed more efficiently toward the community immediately after a storm event.

**Environmental:** Hardening Village Hall could reduce contamination from potential building flooding and minimize associated overflow of stormwater runoff.

### Anticipated Reduction of Risk Associated with the Project

This project would result in a reduction of risk to one critical asset, Village Hall. Village Hall’s vulnerability would decrease considerably as a result of implementation of redundant power systems and elevation of vital records.

The project would indirectly reduce risk to all Village assets by providing continuity of government services during and after storm events.

### Cost-Benefit Analysis of Undertaking the Project

The project’s useful life matches the useful life of the building structure. Associated maintenance costs would be minimal and would limit the need for urgent or major repair or remediation work following disasters.

The project expenditure of \$400,000 is justified given that the project would allow the Village to comply more faithfully with the requirements of New York State records management regulations. The project would also ensure more efficient delivery of services in the aftermath of disasters. The greater efficiency of response and recovery options would more than repay the upfront costs associated with this project.

**General time frame for implementing actions:** This project should be implementable in approximately three months from inception.

**Local, State, and Federal government regulatory requirements related to the project, if applicable:** No permits are required for Village projects on Village property.

**Entity with jurisdiction over the project:** The project is located in the Village of Atlantic Beach in Nassau County.

**Assets: Infrastructure, health and social services**

**Population:1,900 (Village of Atlantic Beach)**

**Key Project Locations:**

- 1 Village Hall

**Early Action Items:**

- Obtain applicable permits

**Related Projects:**

- Microgrid Power System
- Village of Atlantic Beach Community Assistance Center





**Village Hall, Village of Atlantic Beach**  
Source: VAB Building Plans Examiner



**Rooftop solar panels**  
Source: Creative Commons Flick

## B. Featured Projects

Featured Projects are innovative projects in which an initial study or discrete first phase of a project is proposed for CDBG-DR or other identified funding or regulatory reforms or other programs that do not involve capital expenditures. The Committee developed and selected six Featured Projects based on input from residents during multiple Public Engagement Events and comments received through the NYRCR Program website. The Featured Projects are presented as follows:

- Microgrid power system
- Cell phone tower resiliency
- Underground utilities feasibility study
- Stormwater system improvements
- Emergency preparedness guidebook
- Identification of vulnerable and special-needs populations

The project criteria symbols are categorized under the following recovery support functions:





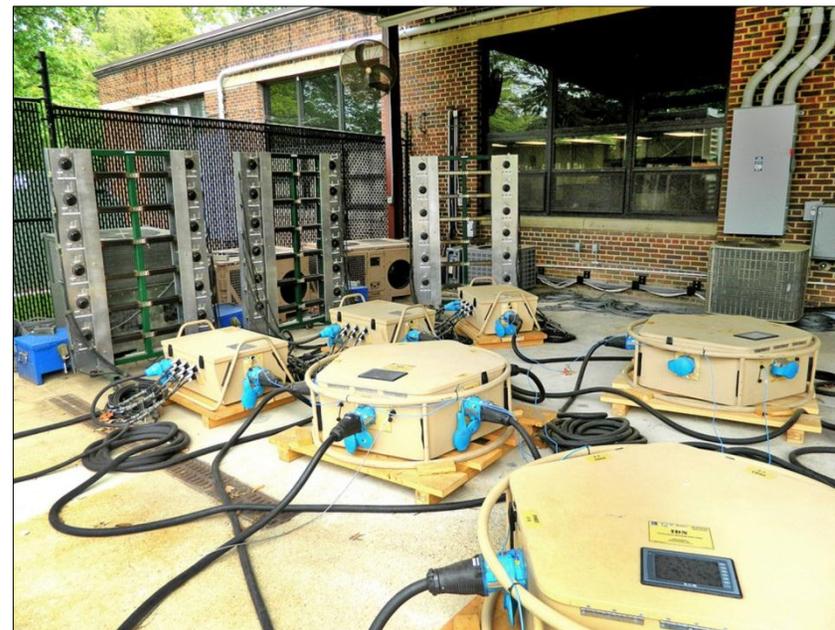
# Microgrid Power System

## Study and Implement a Power Microgrid System

**Project description:** Following Superstorm Sandy, the Community was left without power for more than a week, creating a dangerous situation in the Community and further delaying the ability of residents, business owners, and employees to safely return to the Community.

The Microgrid Power System project consists of a feasibility study, design and implementation of a micro grid power system that would provide backup energy service at key community assets. A microgrid utilizes power generation from a localized and smaller electricity grid to maintain power if the utility grid becomes de-energized in a storm event. Natural gas and hydrogen fuel cells would be used to power key Community assets with local generators.

The project would make the Community more energy independent and self-sustaining during emergencies. The project would provide alternative power sources, including hydrogen fuel cell units at key community assets, which may include two rescue stations, Atlantic Beach Village Hall, the wastewater treatment plant, a proposed Community Assistance Center at the Atlantic Beach Tennis Club in the Village of Atlantic Beach, and a proposed Community Assistance Center in East Atlantic Beach. It was assumed that each asset would have an average demand of 40 to 80K at anticipated peak load and that the standard fuel cell would be a maximum size of 400kw. The location of the fuel cell and generators would be determined during the study and design phases of the project.



**Microgrid installation**  
Source: Creative Commons Flickr



### Cost Estimate

\$19,215,000



### Timeline

TBD





**Short description:** Conduct a feasibility study and implement a power microgrid system throughout the Community.

**Project cost:** \$19,215,000

**Benefit or Co-benefits to Be Derived from the Project**

**Health and Social:** The Community as a whole, including individuals with disabilities, senior citizens, and individuals considered low/moderate income, would benefit from a backup power source during emergencies. The microgrid would allow for greater security in providing continuity of health and social services. Maintaining power to assets the provide emergency services, such as the Atlantic Beach Rescue, Rescue Station 2, and Village of Atlantic Beach Hall would help ensure continuity of operation to these essential services during emergencies, which would reduce risk to all populations in the community. When backup power is already provided to facilities, this project would add an additional layer of redundancy.

**Economic:** Power outages during Superstorm Sandy were severe; by investing in a more reliable power grid, the existing 80 businesses in the Community may be able to return to normal operations more quickly, which would reduce lost productivity and revenue from having a business closed. Investments to the Community’s power grid would establish its commitment to improving infrastructure and emergency preparedness. Potential jobs could be created through maintenance and construction of a microgrid power system and the provision of backup power sources could affect the potential of businesses and residents to locate to or remain in the Community as a result of increased public facilities.

**Environmental:** In the long term, a sustainable power source such as a microgrid system could have a positive impact on the power and infrastructure grid, including minimizing energy costs and pollution. A microgrid power system would reduce the carbon footprint for the Community.

**Anticipated Reduction of Risk Associated with the Project**

This project would result in a reduction to risk for the entire Community, which includes direct risk reductions to six critical assets and a cumulative risk reduction to the Community, which includes 1,900 homes and 80 businesses. Maintaining power supply to the wastewater treatment plant would help ensure continuity of operation of these services to the entire community during an emergency and reduce the potential for discharge of raw or partially treated sewage or other operational failure during hazard events. These improvements would reduce the risk of contamination from wastewater flowing into floodwaters or Reynolds Channel.

**Assets: Atlantic Beach Rescue, Rescue Station 2, Atlantic Beach Tennis Center, Village of Atlantic Beach Hall, and Wastewater Treatment Plant**  
**Population: 4,000+ (entire Community)**

<p><b>Key Project Locations:</b></p> <ul style="list-style-type: none"> <li>1 Community-wide</li> </ul>	<p><b>Early Action Items:</b></p> <ul style="list-style-type: none"> <li>Obtain applicable building and zoning permits.</li> <li>Identify stakeholders</li> </ul>	<p><b>Related Projects:</b></p> <ul style="list-style-type: none"> <li>Solar-Powered Street Lights</li> <li>Underground Utilities Feasibility Study</li> </ul>
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# Cell Phone Tower Resiliency

## Provide Cell Phone Tower Resiliency

**Project description:** Following Superstorm Sandy, the Community was left without reliable cell service for over two weeks. The compromised communication system hampered the ability of residents, business owners, and employees to return safely to the Community. The Cell Phone Tower Resiliency project proposes to provide additional cell phone towers that could be deployed during emergency situations to supplement the existing cellular networks that serve the community and are either damaged by a storm event or overwhelmed by an increase in demand after an emergency. The project would improve communication during emergencies through cell phone tower resiliency.

**Short description:** Improve cell phone tower resiliency during emergencies.

**Project cost:** \$1,600,000



Mobile cell phone tower (Sprint)

Source: Creative Commons Flickr



### Cost Estimate

\$1,600,000



### Timeline

12 months





### Benefit or Co-Benefits to Be Derived from the Project

**Health and Social:** After Superstorm Sandy, there was unreliable or no cell service available in the Community as a result of downed power systems and cell phone towers. This created serious problems for individuals who were isolated in their homes and needed to reach authorities, hindered communication between family members, and made it difficult for residents to obtain assistance of any kind.

This project would improve communications and allow residents to use mobile devices to contact essential health and social services such as medical needs, fire and rescue, and other facilities during emergencies.

**Economic:** Power outages during Superstorm Sandy were severe and the community experienced isolation due to a lack of communication caused by downed power and cell phone towers. The existing 80 businesses in the Community would benefit by being able to return to normal operations more quickly with the availability a reliable communication system. This would reduce lost revenue from having a business closed. Directly, jobs could be created through maintenance and construction of a cell phone tower resiliency project. Indirectly, improving infrastructure can help retain businesses as a result of infrastructure improvements. Long-term costs associated with bolstering public facilities services would be minimal because only maintenance would be required.

Regionally, the project addresses a key strategy in the 2013 Long Island *Strategic Economic Development Plan for Nassau and Suffolk Counties*<sup>56</sup> "to harden our infrastructure, businesses and homes against the next major storm."

### Anticipated Reduction of Risk Associated with the Project

This project would result in a reduction to risk for the entire Community, which includes 40 assets, 1,900 homes, and 80 businesses by providing critical communication needs during outages to all residents and businesses, improving the continuity of operations to emergency services, and helping to provide access to resources.

### Cost-Benefit Analysis of Undertaking the Project

Cell phone tower resiliency would have a long useful life with sustained benefits before, during, and after events that may disrupt use and operation of existing cell phone towers. Upfront costs are high but the overall opportunity cost outweighs this initial investment.

**General time frame for implementing actions:** This project should be implementable within approximately 12 months from inception.

**Local, State, and Federal government regulatory requirements related to the project, if applicable:** Regulatory requirements that would need to be addressed are the applicable Village of Atlantic Beach, the Town of Hempstead, and Nassau County zoning and building permits. The Federal Communications Commission regulates cell towers, and requires all cell towers to have a backup power source.

**Entity with jurisdiction over the project:** The project services the Community and the Town of Hempstead in Nassau County. Jurisdiction over the project includes the Village of Atlantic Beach and the Town of Hempstead, and local utility companies.

**Assets:** Economic development, health and social services, and infrastructure  
**Population:** 4,000+ (entire Community)

Key Project Locations:	Early Action Items:	Related Projects:
1 Community-wide	<ul style="list-style-type: none"> <li>Obtain building and zoning permits and compliance with FCC regulatory requirements</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>





# Underground Utilities Feasibility Study

ABE EAB

## Determine the Potential for Underground Utilities

**Project description:** Following Superstorm Sandy, the Community was left without power for over a week. The lack of power created a dangerous situation and delayed the ability of residents, business owners, and employees to safely return to the Community. It also delayed clean up and repair measures in the Community.

The Underground Utilities Feasibility Study project consists of a feasibility study to determine the potential for underground utilities in areas, specifically East Atlantic Beach.

**Short description:** Conduct a feasibility study to determine the potential for underground utilities in areas, specifically East Atlantic Beach, that are at risk of flooding.

**Project cost:** \$100,000



**Underground utilities installation**  
Source: Creative Commons Flickr



### Cost Estimate

\$100,000



### Timeline

6 months





## Benefit or Co-Benefits to Be Derived from the Project

**Health and social:** This project would reduce live-wire contact injuries and potentially improve pedestrian mobility by reducing the number of power poles and other structures within the public right-of-way.

In addition, maintaining power to assets that provide emergency services would help ensure continuity of operation to essential services during emergencies, which would reduce risk to all populations in the community.

**Economic:** Placing utilities underground can reduce power outages, downed power lines, and failed utilities that result from flooding. Reducing management and cleanup efforts associated with downed power lines would save the utility companies money from repairs and lost revenue during outages that result in a reduction of day-to-day lost electrical sales.

If the study determines the project is feasible, and it is implemented, jobs can be provided during construction and through future maintenance. Regionally, The CGLI Plan<sup>57</sup> from April 2013 supports improvements in flood prevention; green infrastructure associated with the project would contribute to this broader regional plan as described in the CGLI.

**Environmental:** This project would remove the need for the power company to trim trees near power lines, which would increase the tree canopy in East Atlantic Beach. In addition, this project can reduce infrastructure damage and future environmental indirect impacts from replacement. Maintaining power supply to the sewer substations and the wastewater treatment plant would help ensure continuity of operation of these services to the entire Community during an emergency and reduce the potential for discharge of raw or partially treated sewage or other operational failure during hazard events. These improvements would reduce

the risk of contamination from wastewater flowing into floodwaters or Reynolds Channel.

## Anticipated Reduction of Risk Associated with the Project

This project would result in a reduction of risk to two assets located in East Atlantic Beach—a commercial property and beach club. Most importantly, approximately 900 homes would directly benefit from the improved infrastructure and the associated lower risk of long-term power outages. The cumulative risk reduction would help reduce impacts to infrastructure and power outages during flood instances.

## Cost-Benefit Analysis of Undertaking the Project

Underground utilities would have a long useful life with sustained benefits before, during, and after potential storm events by increasing the ability of residents and businesses to maintain normal operations or return to normal operations more quickly after a storm due to a more reliable power supply that would be less likely to be damaged and offline from major storm events. In addition, underground utilities typically have lower storm restoration costs.<sup>58</sup> Upfront costs are high but the overall opportunity cost outweighs this initial investment. Residents in East Atlantic Beach would benefit from this project.

**Assets: Blue Point and Town of Hempstead Beach House**  
**Population: 2,000 (approximately)**

<p><b>Key Project Locations:</b></p> <ul style="list-style-type: none"> <li>1 East Atlantic Beach</li> </ul>	<p><b>Early Action Items:</b></p> <ul style="list-style-type: none"> <li>• Begin scoping the feasibility study</li> </ul>	<p><b>Related Projects:</b></p> <ul style="list-style-type: none"> <li>• Microgrid Power System</li> </ul>
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**General time frame for implementing actions:** This project should take approximately six months to complete.

**Local, State, and Federal government regulatory requirements related to the project, if applicable:** No permits are required for a feasibility study.

**Entity with jurisdiction over the project:** The Town of Hempstead, in Nassau County.





# Stormwater System Improvements

## Adapt Existing Open Spaces for Floodwater Catch Basins

**Project description:** Superstorm Sandy caused significant flooding in the Community. The purpose of the Stormwater System Improvements project is to reduce floodwater levels in the community during future storm events. Stormwater catch basins can reduce flooding by increasing capacity and capturing the stormwater and retaining it until it infiltrates the soil or is released slowly over time. The methods decrease the likelihood of flooding.

This project would evaluate the adaption of existing open spaces and parks for storm floodwater catch basins.

**Short description:** Study adaption of existing open spaces for floodwater catch basins.

**Project cost:** \$10,000



**Stormwater catch basin**  
Source: Creative Commons Flickr



### Cost Estimate

\$10,000



### Timeline

6 months





### Benefit or Co-Benefits to Be Derived from the Project

**Health and social:** If implemented, the project would reduce or potentially prevent flooding for assets, residents, and businesses located in flood-prone areas. Health and social service facilities would be more accessible due to a reduction of flooding in the community that includes flooding impacts to homes, health and social facilities, and the roadways that are used to access these points of interest during and after flooding events as a result of the project.

**Economic:** Creating floodwater catch basins would help prevent stormwater point source discharges into coastal water and reduce flood potential of vital community economic assets. Investing in preventative measures for flooding and stormwater management would benefit fisherman, the beach clubs, and other businesses that depend on the water and natural ecosystem.

Regionally, The CGLI Plan from April 2013 recommends transportation strategies related to improved flood prevention, green infrastructure associated with the project would contribute to this broader regional plan as described in the CGLI.<sup>59</sup>

**Environmental:** This project would provide improved coastal water quality and reduce point-source discharges, particularly runoff into nearby Reynolds

Channel. Green infrastructure would allow for a reduction of impermeable surfaces, increasing natural groundwater recharge.

### Anticipated Reduction of Risk Associated with the Project

This project would result in a reduction of risk to assets that are located in areas prone to flooding. In particular, during Superstorm Sandy, floodwaters either damaged or threatened to damage the wastewater treatment plant, sewer substations, the Village of Atlantic Beach Hall, and other economic development, health and social services, and infrastructure assets. In addition, floodwaters affected 961 residences. The cumulative risk reduction would help reduce the impacts to flooding through adapting existing open spaces and parks as significant storm floodwater catch basins.

**Assets: Economic development, health and social services, infrastructure**  
**Population: 4,000+ (entire Community)**

Key Project Locations:	Early Action Items:	Related Projects:
<p>1 Community-wide</p>	<ul style="list-style-type: none"> <li>Hire a consulting firm to begin feasibility study</li> <li>Identify existing open spaces or parks for potential floodwater catch basins</li> </ul>	<ul style="list-style-type: none"> <li>Complete Streets/Drainage Improvements along Beech Street</li> <li>Install Backflow Preventers</li> <li>Assess Feasibility and Economic Impact of Perimeter Dune System</li> </ul>



## Cost-Benefit Analysis of Undertaking the Project

Bolstering open space to include stormwater catch basins would provide a long useful life and provide sustained benefits before, during, and after potential flooding events. Minimal maintenance costs are associated with stormwater catch basins but include periodic cleaning. No known negative externalities or opportunity costs.

**General time frame for implementing actions:** This project would be implementable within six months.

**Local, State, and Federal government regulatory requirements related to the project, if applicable:** No permits are required for a feasibility study.

**Entity with jurisdiction over the project:** The project services the Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach. Jurisdiction over the project includes the Village of Atlantic Beach and the Town of Hempstead, both in Nassau County.





# Emergency Preparedness Guidebook

VAB ABE EAB

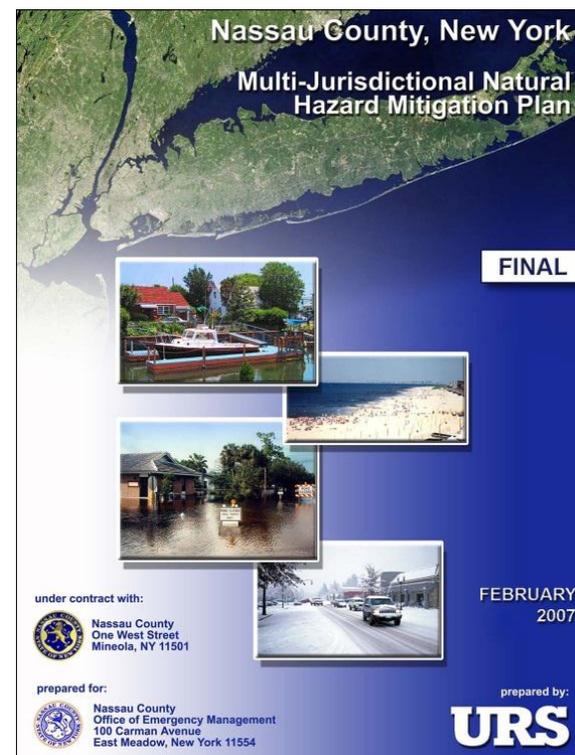
## Draft and Disseminate an Emergency Preparedness Guidebook

**Project description:** During preparations for Superstorm Sandy and immediately following, it became apparent that many residents and businesses were not properly prepared for an emergency. Many residents did not evacuate prior to Superstorm Sandy.

The Emergency Preparedness Guidebook project would help residents and businesses gather resources such as tools, supplies, and medications in a central location and develop plans for communication and evacuation. This project should be coordinated with the Town of Hempstead and Nassau County to draft and disseminate an emergency preparedness guidebook to all residents.

**Short description:** Draft and disseminate an emergency preparedness guidebook in coordination with Nassau County, Town of Hempstead, and the City of Long Beach for distribution to all residents.

**Project cost:** \$100,000



Nassau County, NY hazard mitigation plan  
Source: Nassau County, NY



### Cost Estimate

\$100,000



### Timeline

6 months





### Benefit or Co-Benefits to Be Derived from the Project

**Health and social:** This project would provide information on vital services during and after storm events to all residents but may be most relevant to vulnerable populations with special needs, mobility limitation, and financial restraints that may make evacuations less plausible. Given this, the project would educate and inform those in need of shelters and other emergency-related services that may be available to them.

**Economic:** This project would help businesses plan and be prepared to handle disasters and other emergencies. Through planning for these events, businesses would likely be able to reduce the number of days they are closed and may reduce their losses due to disaster situations.

**Environmental:** Not applicable.

### Anticipated Reduction of Risk associated with the Project

This project would result in a reduction to risk for the entire Community, including risk reductions to the 40 critical assets identified by the Community and the Committee.

### Cost-Benefit Analysis of Undertaking the Project

Additional emergency preparedness would provide strong benefits past the useful life of this project, sustaining benefits. Establishing capacity to maintain follow-through of the guidebook would ultimately be imperative to the overall success of the project.

**General time frame for implementing actions:** This project should be implementable within six months.

**Local, State, and Federal government regulatory requirements related to the project, if applicable:** No permits are required.

**Entity with jurisdiction over the project:** The project would service the Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach. Jurisdiction over the project includes the Village of Atlantic Beach and the Town of Hempstead, both in Nassau County.

**Assets:** Economic development, health and social services  
**Population:** 4,000+ (entire community)

Key Project Locations:	Early Action Items:	Related Projects:
1 Community-wide	<ul style="list-style-type: none"> <li>Identify applicable stakeholders</li> </ul>	



# Identification of Vulnerable and Special-Needs Populations



VAB ABE EAB

## Identify Vulnerable and Special-Needs Populations

**Project description:** Following Superstorm Sandy, emergency service providers and health and social service providers were not able to easily identify vulnerable and special-needs populations within the Community. Identification of vulnerable and special-needs populations is critical in providing them with the services they may require or be able to check on individuals by stopping by their residences and calling them. The Identification of Vulnerable and Special-Needs Populations project would set up special-needs registration so that vulnerable people can identify themselves and emergency and social service providers can appropriately reach out to the populations that are in need of services during emergencies. This project would be coordinated with Nassau County.

**Short description:** Identify vulnerable and special-needs populations through a special-needs registration.

**Project cost:** \$8,000



The New Nautilus Hotel, Village of Atlantic Beach  
Source: LiRo



### Cost Estimate

\$8,000



### Timeline

6 months





**Benefit or Co-Benefits to be Derived from the Project**

**Health and social:** This project would directly benefit individuals with disabilities, senior citizens, and individuals considered low/moderate income living in the Community. During Superstorm Sandy, these populations were not recognized and this project would provide continuity of health and social services once individuals are identified. Through U.S. Census data collection, the number and percentage of individuals in the Community with disabilities, senior citizens, and individuals considered low/moderate income are known, but their location and health and social needs are not documented. Establishing a registration so vulnerable persons can identify themselves and receive needed services during emergencies is the focus of the project.

**Anticipated Reduction of Risk Associated with the Project**

This project would help reduce risk to vulnerable and special-needs populations within the Community.

**Cost-Benefit Analysis of Undertaking the Project**

Identifying vulnerable and special-needs populations would provide benefits beyond the useful life of this project. No known negative externalities or opportunity costs.

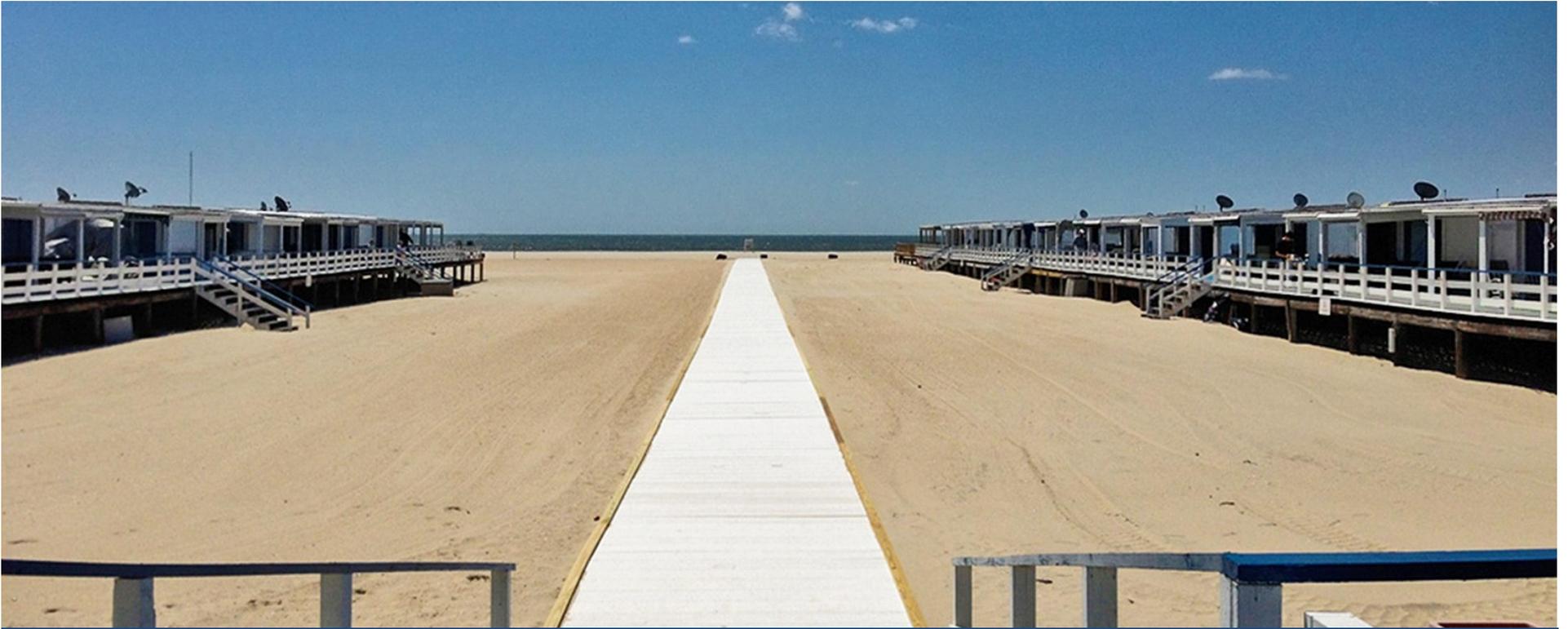
**General time frame for implementing actions:** This project is expected to be implemented over six months.

**Local, State, and Federal government regulatory requirements related to the project, if applicable:** No permits are required.

**Entity with jurisdiction over the project:** Nassau County Office of Emergency Management is identifying vulnerable populations to ensure that assistance in the event of emergency is provided

**Assets:** The New Nautilus Hotel  
**Population:** Unknown

<p><b>Key Project Locations:</b></p> <ul style="list-style-type: none"> <li>1 Community-wide</li> </ul>	<p><b>Early Action Items:</b></p> <ul style="list-style-type: none"> <li>• Identify applicable stakeholders</li> </ul>	<p><b>Related Projects:</b></p> <ul style="list-style-type: none"> <li>• None</li> </ul>
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## **Section V: Additional Materials**

# Section V: Additional Materials

## A. Additional Resiliency Recommendations

Additional Resiliency Recommendations are resiliency projects and actions the Committee would like to highlight but are not categorized as Proposed or Featured Projects. The Additional Resiliency Recommendations are listed in Table V-1 and are categorized by strategy, project name, project description, and whether the project has a regional focus.

**Table V-1: Additional Resiliency Recommendations**

Strategy	Project Name	Project Description	Estimated Cost	Regional Project (Y/N)
Protect critical Infrastructure to create community resilience and sustainability to ensure continuing services needed before, during, and after disasters	Beach Club Utility Improvements	Assist beach clubs in improving infrastructure and support owners' applications for funding assistance offered through loan or grant programs for utility improvements including solar thermal and photovoltaic systems.	\$50K	N
	Evaluate the use of Permeable Pavement	Consider installing permeable pavement in future road paving projects and parking lots; consider whether permeable paving is an option to replace existing pavement.	\$40K	N
	Protect and Enhance Jetties	Assess the condition of jetties.	\$75K	Y
Increase the Community's capacity to facilitate and foster actions that lead to greater resiliency, emergency preparedness, and sustainability	Zoning Code Amendments	Revise zoning codes to encourage conformity in new building heights; including heating, ventilation, and air-conditioning (HVAC) placement, hardening, and requirements for new construction to meet necessary elevation standards. Update zoning codes to reflect current best practices in stormwater management and hazard mitigation; design standards for features such as surface parking lots for both aesthetic/environmental benefits that may enhance property values and preserve community character; and assess the potential use of the EPA's national menu of stormwater best management practices, which aim to improve stormwater management while improving coastal water quality.	\$15K	Y



**Table V-1 (Continued)**

Strategy	Project Name	Project Description	Estimated Cost	Regional Project (Y/N)
	Review Underground Stormwater Detention Regulations	Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach. Review underground stormwater detention regulations and determine whether they can be strengthened to reduce surface water runoff and associated flooding with new development/redeveloped parcels (if feasible throughout the Community).	\$100K	N
Implement measures to make the Community's economic drivers more resilient	Urban Park and Plaza	Develop an urban plaza, park, or garden within the NYRCR Community to support economic vitality of the Community; incorporate active and passive recreational elements including a playground, basketball courts, tables, benches, space for entertainment, landscaping, and walkways with activity stations.	\$75K	Y
	Business Continuity Plans	Assist the private beach clubs and small businesses with preparing business continuity plans for power outages and other emergencies.	\$100K	N
	Coordination with Community-Based and Non-Governmental Organizations	Coordinate community-based, non-governmental entities to receive funding for approved projects.	\$8K	Y
Protect critical Community health and social services assets and increase the capacity to provide needed emergency and community services before, during, and after disasters	Disaster Recovery Service Vendors	Prepare a list of disaster recovery service vendors for the Community and enter into Memoranda of Understanding.	\$8K	Y
	Targeted Housing Mitigation Measures for Near-Term Implementation	Explore and support additional mitigation measures for housing.	\$150K	Y



## B. Master Table of Projects

The Proposed Project, Featured Projects, and Additional Resiliency Recommendations identified throughout the NYRCR Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach Community Reconstruction Plan are reflected in Table V-2. These projects are categorized according to strategy, project name, project description, reconstruction strategies, estimated cost, and whether the project has a regional focus.

**Table V-2: Proposed, Featured, and Additional Resiliency Recommendations**

Strategy	Project Name	Short Project Description	Project Category	Estimated Cost	Regional Project (Y/N)
Protect critical infrastructure to create community resilience and sustainability to ensure continuing services needed before, during, and after disasters	Harden Water Reclamation Plant	Provide resiliency to the existing Water Reclamation Plant and three pump stations to maintain functionality during rain and hazard events.	Proposed	\$720K	N
	Emergency Medical Services	Protect and fortify the existing Atlantic Beach Rescue Building through improved infrastructure and communication systems.	Proposed	\$460K	Y
	Complete Streets/Drainage Improvements along Beech Street	Use Complete Streets to provide phased drainage and street improvements along emergency evacuation routes through stormwater best management practices, infrastructure improvements, and traffic safety and management measures.	Proposed	\$5.5M	N
	Solar-Powered Street Lights	Provide light-emitting diode (LED) street lighting that is solar-powered to prevent loss of lighting in the event of power outages.	Proposed	\$1.3M	Y
Increase the Community's capacity to facilitate and foster actions that lead to greater resiliency, emergency preparedness, and sustainability	Village of Atlantic Beach Community Assistance Center	Retrofit the Tennis Center in the Village of Atlantic Beach to be used as a Community Assistance Center, including improvements to drainage and the incorporation of active and passive recreational elements.	Proposed	\$2M	N
	East Atlantic Beach Community Assistance Center Feasibility Study	Evaluate and identify a location for a Community Assistance Center in East Atlantic Beach for Atlantic Beach Estates and East Atlantic Beach.	Proposed	\$50K	N



**Table V-2 (Continued)**

Strategy	Project Name	Short Project Description	Project Category	Estimated Cost	Regional Project (Y/N)
Protect critical infrastructure to create community resilience and sustainability to ensure continuing services needed before, during, and after disasters	Install Backflow Preventers	Install backflow preventers and storm drain covers throughout the Community to mitigate flooding and prevent debris from entering drains.	Proposed	\$360K	Y
Restore and enhance natural resources for both resiliency and recreation purposes while also protecting important cultural resources	Assess Feasibility and Economic Impact of Perimeter Dune System	Study the cost effectiveness and technical feasibility of a dune perimeter system, including benefits and risks to beach clubs.	Proposed	\$500K	Y
Increase the Community's capacity to facilitate and foster actions that lead to greater resiliency, emergency preparedness, and sustainability	Atlantic Beach Village Hall	Provide upgrades and protection to Atlantic Beach Village Hall to maintain continuity of operations and protect vital records during and after storm events.	Proposed	\$400K	N
Protect critical infrastructure to create community resilience and sustainability to ensure continuing services needed before, during, and after disasters	Microgrid Power System	Conduct a feasibility study and implement a power microgrid system throughout the Community.	Featured	\$19.2M	Y
Implement measures to make the Community's economic drivers more resilient	Cell Phone Tower Resiliency	Improve cell phone tower resiliency during emergencies.	Featured	\$1.6M	Y
Protect critical infrastructure to create community resilience and sustainability to ensure continuing services needed before, during, and after disasters	Underground Utilities Feasibility Study	Conduct a feasibility study to determine the potential for underground utilities in areas, specifically East Atlantic Beach, that are at risk of flooding.	Featured	\$100K	N
	Stormwater System Improvements	Study adaption of existing open spaces for floodwater catch basins.	Featured	\$10K	N



**Table V-2 (Continued)**

Strategy	Project Name	Short Project Description	Project Category	Estimated Cost	Regional Project (Y/N)
Increase the Community’s capacity to facilitate and foster actions that lead to greater resiliency, emergency preparedness, and sustainability	Emergency Preparedness Guidebook	Draft and disseminate an emergency preparedness guidebook in coordination with Nassau County, Town of Hempstead, and the City of Long Beach for distribution to all residents.	Featured	\$100K	Y
	Identification of Vulnerable and Special-Needs Populations	Identify vulnerable and special-needs populations through a special-needs registration.	Featured	\$8K	Y
Protect critical Infrastructure to create community resilience and sustainability to ensure continuing services needed before, during, and after disasters	Beach Club Utility Improvements	Assist beach clubs in improving infrastructure and support owners' applications for funding assistance.	Additional Resiliency Recommendation	\$50K	N
	Evaluate the use of Permeable Pavement	Consider installing permeable pavement in future road paving projects and parking lots.	Additional Resiliency Recommendation	\$40K	N
	Protect and Enhance Jetties	Assess the condition of jetties.	Additional Resiliency Recommendation	\$75K	Y
Increase the Community’s capacity to facilitate and foster actions that lead to greater resiliency, emergency preparedness, and sustainability	Zoning Code Amendments	Revise zoning codes to encourage conformity in building heights, construction standards, and best practices in stormwater management and hazard mitigation.	Additional Resiliency Recommendation	\$15K	Y
	Review Underground Stormwater Detention Regulations	Review underground stormwater detention regulations and determine if they can be strengthened to reduce surface water runoff and associated flooding.	Additional Resiliency Recommendation	\$100K	N



**Table V-2 (Continued)**

Strategy	Project Name	Short Project Description	Project Category	Estimated Cost	Regional Project (Y/N)
Implement measures to make the Community's economic drivers more resilient	Urban Park and Plaza	Develop an urban plaza, park, or garden to support economic vitality and recreation in the Community.	Additional Resiliency Recommendation	\$75K	Y
	Business Continuity Plans	Assist the private beach clubs and small businesses with preparing business continuity plans.	Additional Resiliency Recommendation	\$100K	N
	Coordination with Community-Based and Non-Governmental Organizations	Coordinate community-based, non-governmental entities to receive funding for approved projects.	Additional Resiliency Recommendation	\$8K	Y
Protect critical Community health and social services assets and increase the capacity to provide needed emergency and community services before, during, and after disasters	Disaster Recovery Service Vendors	Prepare a list of disaster recovery service vendors for the Community and enter into Memoranda of Understanding.	Additional Resiliency Recommendation	\$8K	Y
	Targeted Housing Mitigation Measures for Near-term Implementation	Explore and support additional mitigation measures for housing.	Additional Resiliency Recommendation	\$150K	Y



## C. Public Engagement Process

To ensure the success of the NYRCR Community Plan, a broad-reaching Public Engagement Strategy was established and implemented including collaborative work in coordination with the Committee. The citizens of the Community were provided extensive opportunities for collaboration in three Public Engagement Events between September 2013 and March 2014.

### NYRCR Planning Committee process

The Committee held 13 meetings between September 18, 2013, and March 26, 2014. The Committee discussed local issues, opportunities, and communication strategies; and offered the public opportunities to provide comments at the conclusion of each Planning Committee Meeting.

The series of the first five Committee meetings focused on reviewing the NYRCR Plan process, including identifying key elements and goals for developing a community vision and conducting public outreach. The Committee was encouraged to think broadly about community planning, economic vitality, and quality of life issues. The Committee identified assets and examined risk areas to create the first series of conceptual resiliency strategies for the Community to be presented during the first Public Engagement Event.

After the first and second Public Engagement Events and during the subsequent Committee meeting, the community vision was finalized along with the review of the Community assets and strategies. The review of the Draft Conceptual Plan by the Committee focused primarily on the key strategies and the actions to implement the strategies such as prioritizing strategies and potential key projects to increase resiliency. After public input from the second Public Engagement Event, the Committee identified seven Proposed Projects. The Committee discussed the projects and strategies in terms of the anticipated community benefit and in terms of the Proposed Projects that responded to Community needs that were posed or exacerbated by Superstorm Sandy.

The final Committee Meetings included preparing the risk assessment and cost benefit analysis for the preliminary project reporting, which involved placing scores on each project based upon six criteria: feasibility, cost, risk reduction, co-benefits, funding, and public support. The Committee provided

input on the evaluation of vulnerability for affected assets and finalized the risk assessment analysis. The Committee focused on reaching consensus on the Proposed Projects and reviewing the results of a qualitative analysis that considered feasibility, cost, and funding for the projects.

The projects were categorized into three categories: Proposed Projects, Featured Projects, and Additional Resiliency Recommendations. During this phase, the third Public Engagement Event served to obtain public feedback and input on the Proposed and Featured Projects for the final plan. The Committee then voted on both Proposed and Featured Projects and reviewed the final Plan.

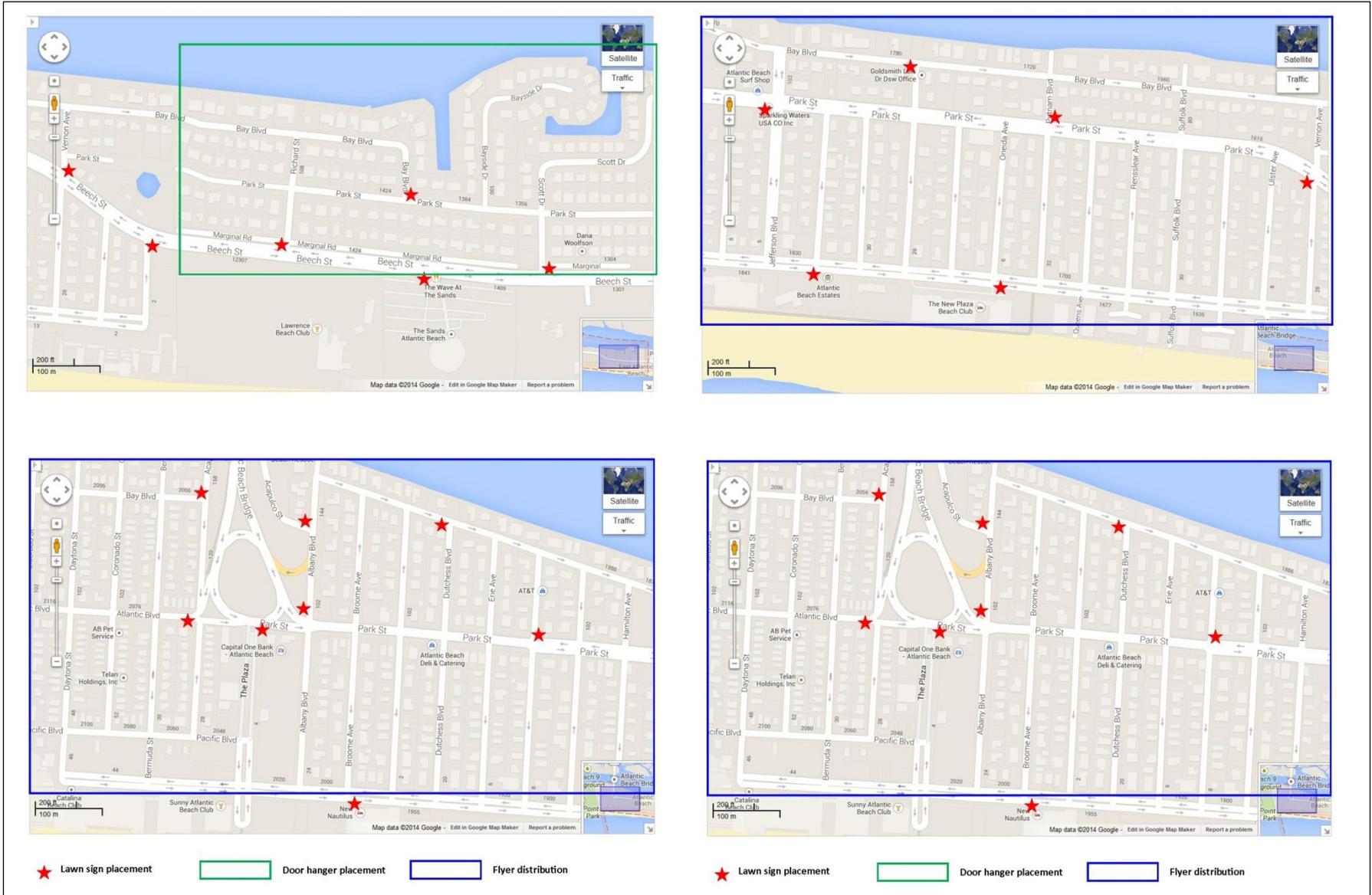
### Public Engagement Events

The Public Engagement Events were designed to solicit feedback from the Community on the NYRCR planning process and deliverables and on conducting outreach through a variety of mediums and methods.

Meeting notices for Public Engagement Events were posted as follows:

- Website: <http://stormrecovery.ny.gov/nyrcr/contact/village-atlantic-beach-and-east-atlantic-beach>
- *Nassau Herald* (local community newspaper)
- Various locations accessible for public viewing
- Twitter: @NYStormRecovery
- Facebook: NYStormRecovery

Information, door hangers, and flyers were distributed both manually and electronically to the Committee members, who subsequently distributed flyers within their residential neighborhoods. Flyers and electronic notices were distributed to the businesses and beach clubs in the Community.



Distribution of third Public Engagement Meeting materials



## First Public Engagement Event

The first Public Engagement Event was held on October 16, 2013, at the Sands Beach Club in the Village of Atlantic Beach and had approximately 100 attendees. The event was designed to provide an overview of the NYRCR Program while engaging community members in a small group forum in a discussion about a community vision, community assets, vulnerabilities, and strategies for becoming more resilient. The Committee co-chairs opened the meeting with welcoming remarks and an overview of the planning process. The State gave a short presentation on the NYRCR Program. During an interactive workshop, the Consultant Team facilitated small group discussions about planning for resiliency with the attendees.



**First Public Engagement Meeting, October 16, 2013**  
Source: Sustainable Long Island

## Second Public Engagement Event

The second Public Engagement Event was held on November 13, 2013, at the Sands Beach Club in the Village of Atlantic Beach and had approximately 95 attendees. A small group discussion format was used to conduct three interactive sessions addressing priority strategies to increase resiliency; prioritize potential key projects; and to conduct a mapping exercise of stormwater infrastructure and flooding problems. The first activity addressed potential strategies and projects in the Conceptual Plan for all six recovery

support functions. The second activity involved ranking seven Proposed Projects. The third activity was a facilitated mapping exercise that identified flooding problem areas and stormwater management. The public identified locations of flooding events, along with examples of the top strategies recommended by the public.



**Second Public Engagement Meeting, February 12, 2014**  
Source: URS

## Third Public Engagement Event

The Third Public Engagement Event was held on February 12, 2014, at the Sands Beach Club in Club in the Village of Atlantic Beach and had approximately 70 attendees. An Open House format provided ten project stations that included project boards, and were staffed by the Consultant Team and Committee members to answer questions from the participants. The project boards contained pictures, criteria rankings, maps, and prompts for the public to identify support and comments. Participants were handed a Project Evaluation Guide that listed all the projects and allowed for the public to provide feedback. Forty-eight of the guides were collected at the end of the night and the information was tallied and results were presented to the Committee.



**Third Public Engagement  
Event, February 12, 2014**  
Source: URS

## Fourth Public Engagement Event

The date of the fourth Public Engagement Event is to be determined. Completed plans will be presented to the public.

## D. Community Asset Inventory

The Community Asset Inventory identifies assets that have been affected by coastal hazards, including assets that have potential to be at risk from hazard events. Assets whose loss of impairment would compromise essential cultural, social, economic, or environmental functions of the community are also included. This asset inventory was presented to the Committee during a series of Committee meeting on the basis of Community input during Public

Engagement Events. The assets are categorized according to asset name, risk area, asset class, whether the asset is a critical facility, the community value, landscape attributes, and risk assessment scores. To interpret risk scores, see Figure V-2. For description of risk assessment methods, see Section II, Assessment of Risk and Needs.



**Table V-3: Community Asset Inventory and Risk Assessment Scores**

Asset	Asset Information				Landscape Attributes							Risk Assessment			
	Risk Area	Asset Class	Critical Facility	Community Value	Erosion Rate <sup>(1)</sup>	Beach Width <sup>(2)</sup>	Shore Defenses <sup>(3)</sup>	Protective Vegetation <sup>(4)</sup>	Dunes or Bluffs <sup>(5)</sup>	Soils <sup>(6)</sup>	Landscape Attribute Score <sup>(7)</sup>	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
<b>99 The Plaza</b>	High	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	3	4	<b>36</b>
<b>Atlantic Beach Club</b>	Extreme	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	3	<b>36</b>
<b>Atlantic Beach Tennis Center</b>	High	Natural and Cultural Resources	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	3	4	<b>36</b>
<b>Blue Point</b>	Extreme	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	5	<b>60</b>
<b>Boardwalk</b>	Extreme	Natural and Cultural Resources	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	4	<b>48</b>
<b>Catalina Beach Club</b>	Extreme	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	3	<b>36</b>
<b>Chair House</b>	Extreme	Natural and Cultural Resources	No	Low	No	No	Yes	Yes	Yes	Yes	2	3	4	4	<b>48</b>
<b>Clearwater Beach Club</b>	Extreme	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	4	<b>48</b>
<b>Dutchess Chair House</b>	Extreme	Natural and Cultural Resources	No	Low	No	No	Yes	Yes	Yes	Yes	2	3	4	4	<b>48</b>
<b>Eldorado Chair House</b>	Extreme	Natural and Cultural Resources	No	Low	No	No	Yes	Yes	Yes	Yes	2	3	4	4	<b>48</b>
<b>Electric Substation C</b>	High	Infrastructure Systems	Yes, FEMA	High	No	No	Yes	Yes	Yes	Yes	2	3	3	4	<b>36</b>
<b>Inwood Beach Club</b>	Extreme	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	1	<b>12</b>
<b>Jefferson Chair House</b>	Extreme	Natural and Cultural Resources	No	Low	No	No	Yes	Yes	Yes	Yes	2	3	4	4	<b>48</b>
<b>Jewish Center – Atlantic Beach</b>	High	Natural and Cultural Resources	No	Low	No	No	Yes	Yes	Yes	Yes	2	3	3	4	<b>36</b>
<b>Lawrence Beach Club</b>	Extreme	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	3	<b>36</b>
<b>Montgomery Chair House</b>	Extreme	Natural and Cultural Resources	No	Low	No	No	Yes	Yes	Yes	Yes	2	3	4	4	<b>48</b>
<b>New Nautilus Hotel</b>	Extreme	Housing	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	4	<b>48</b>
<b>Ocean Club</b>	Extreme	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	2	<b>24</b>
<b>Police Booth</b>	Moderate	Health and Social Services	Yes, FEMA	Low	No	No	Yes	Yes	Yes	Yes	2	3	2	3	<b>23</b>
<b>Post Office</b>	High	Health and Social Services	No	Low	No	No	Yes	Yes	Yes	Yes	2	3	3	4	<b>36</b>
<b>Putnam Chair House</b>	Extreme	Economic	No	Low	No	No	Yes	Yes	Yes	Yes	2	3	4	4	<b>48</b>
<b>Rescue Squad</b>	Moderate	Health and Social Services	Yes, FEMA	High	No	No	Yes	Yes	Yes	Yes	2	3	2	2	<b>15</b>
<b>Rescue Station 2</b>	High	Health and Social Services	Yes, FEMA	High	No	No	Yes	Yes	Yes	Yes	2	3	3	2	<b>18</b>
<b>Sewer Substation A</b>	High	Infrastructure Systems	Yes, FEMA	High	No	No	Yes	Yes	Yes	Yes	2	3	3	4	<b>36</b>
<b>Sewer Substation B</b>	High	Infrastructure Systems	Yes, FEMA	High	No	No	Yes	Yes	Yes	Yes	2	3	3	4	<b>36</b>



Table V-3 (Continued)

Asset	Asset Information				Landscape Attributes							Risk Assessment			
	Risk Area	Asset Class	Critical Facility	Community Value	Erosion Rate <sup>(1)</sup>	Beach Width <sup>(2)</sup>	Shore Defenses <sup>(3)</sup>	Protective Vegetation <sup>(4)</sup>	Dunes or Bluffs <sup>(5)</sup>	Soils <sup>(6)</sup>	Landscape Attribute Score <sup>(7)</sup>	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Sewer Substation C	High	Infrastructure Systems	Yes, FEMA	High	No	No	Yes	Yes	Yes	Yes	2	3	3	4	36
Silver Point Beach Club	High	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	3	4	36
Single Family Residences	High	Housing	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	3	4	36
Sun & Surf Beach Club	High	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	3	3	27
Sunny Atlantic Beach Club	Extreme	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	4	48
The New Plaza Beach Club	Extreme	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	4	48
The Plaza Chair House	Extreme	Natural and Cultural Resources	No	Low	No	No	Yes	Yes	Yes	Yes	2	3	4	4	48
The Sands Atlantic Beach Club	Extreme	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	4	48
The Shores-Main Beach Club	Extreme	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	3	36
The Shores-West Beach Club	Extreme	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	3	36
Town of Hempstead Atlantic Beach, Beach Club	Extreme	Economic	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	1	12
Troy Beach House	Extreme	Natural and Cultural Resources	No	Medium	No	No	Yes	Yes	Yes	Yes	2	3	4	3	36
Vernon Chair House	Extreme	Natural and Cultural Resources	No	Low	No	No	Yes	Yes	Yes	Yes	2	3	4	5	60
Atlantic Beach Village Hall	High	Health and Social Services	Yes, FEMA	High	No	No	Yes	Yes	Yes	Yes	2	3	3	3	27
Wastewater Treatment Plant	Moderate	Infrastructure Systems	Yes, FEMA	High	No	No	Yes	Yes	Yes	Yes	2	3	2	4	30
Wastewater Treatment Plant	High	Infrastructure Systems	Yes, FEMA	High	No	No	Yes	Yes	Yes	Yes	2	3	3	5	45

- (1) Erosion rate: Long-term average erosion rate ≥1 foot per year or unknown
- (2) Beach width: Waterline frequently at shore defense or upland vegetation
- (3) Shore defenses: Absent, not constructed to anticipated conditions, or deteriorating
- (4) Protective vegetation: Dense, healthy vegetation, wetlands between asset and flood source absent
- (5) Dunes or bluffs: Dunes absent, below BFE, discontinuous, eroding; Bluff slope unstable, little vegetation
- (6) Soils: Asset on coastal barrier island or filled wetland
- (7) Landscape attribute score: "Yes" = +0.5



Figure V-2: Risk Score Interpretation

		100-year event (Hazard score = 3)				
Exposure	5	15	30	45	60	75
	4.5	13	27	40.5	54	67.5
	4	12	24	36	48	60
	3.5	10.5	21	31.5	42	52.5
	3	9	18	27	36	45
	2.5	7.5	15	22.5	30	37.5
	2	6	12	18	24	30
	1.5	4.5	9	13.5	18	22.5
	1	3	6	9	12	15
	0.5	1.5	3	4.5	6	7.5
		1	2	3	4	5
		Vulnerability				

Risk Category	100-year Event Risk Score	500-year Event Risk Score	Comment
<b>Severe</b>	>53	>70	Risk scores in this category occur only if one of the two factors, exposure or vulnerability, is rated 5, and the other is 4 or higher; this could represent that the asset is in a dangerous situation. Both exposure and vulnerability should be reduced, if possible. Consider relocation a priority option for these assets.
<b>High</b>	24 – 53	32 – 70	Risk scores in this category are indicative of conditions that could lead to significant negative outcomes from a storm. Using the risk scoring system, a total of 24 (or 32 for the 500-year event) can only be achieved if the vulnerability is 4 and exposure is 2, or vice versa. A vulnerability of 4 indicates the likely loss of service of an asset for an extended period of time. For many assets this may be unacceptable. Actions should be taken to reduce vulnerability, such as elevating or floodproofing the asset, to help avoid a long-term loss of function. A score of 4 for exposure indicates most of the local landscape attributes that help reduce storm damages are absent. Actions to restore landscape attributes may be appropriate. All other risk scores higher than 24 (or 32 for the 500-year event) indicate either the exposure or the vulnerability, or both, are higher than the conditions discussed above, lending more weight to the need to take actions that reduce risk. Relocation may be necessary in the future if other means of adaptation or management actions are not effective.
<b>Moderate</b>	6 – 23	8 – 31	Risk scores in this category pose moderate to serious consequences, but adaptation may be of lower priority due to one factor, exposure or vulnerability, remaining relatively low. Use a combination of measures to reduce exposure and/or vulnerability.
<b>Residual</b>	<6	<8	Risk scores in this category occur when both exposure and vulnerability are relatively low. This situation suggests floods would pose minor or infrequent consequences. However, a vulnerability score of 3 may not be acceptable for critical facilities or high community value assets, because the community cannot afford to be without these services, event on an infrequent basis. Note that risk is never completely eliminated. Some residual risk still remains even after management measures have been implemented. Monitor conditions and adapt as necessary.



**Table V-4: Risk Assessment Scores**

Asset	Risk Assessment			
	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
99 The Plaza	3	3	4	36
Atlantic Beach Club	3	4	3	36
Atlantic Beach Tennis Center	3	3	4	36
Beach House	3	4	3	36
Blue Point	3	4	5	60
Boardwalk	3	4	4	48
Catalina Beach Club	3	4	3	36
Chair House	3	4	4	48
Clearwater Beach Club	3	4	4	48
Dutchess Chair House	3	4	4	48
Eldorado Chair House	3	4	4	48
Electric Substation C	3	3	4	36
Inwood Beach Club	3	4	1	12
Jefferson Chair House	3	4	4	48
Jewish Center – Atlantic Beach	3	3	4	36
Lawrence Beach Club	3	4	3	36
Montgomery Chair House	3	4	4	48
New Nautilus Hotel	3	4	4	48
Ocean Club	3	4	2	24
Police Booth	3	2.5	3	23
Post Office	3	3	4	36
Putnam Chair House	3	4	4	48



**Table V-4 (Continued)**

Asset	Risk Assessment			
	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Rescue Squad	3	2.5	2	15
Rescue Station 2	3	3	2	18
Sewer Substation A	3	3	4	36
Sewer Substation B	3	3	4	36
Sewer Substation C	3	3	4	36
Silver Point Beach Club	3	3	4	36
Sun & Surf Beach Club	3	3	3	27
Sunny Atlantic Beach Club	3	4	4	48
The New Plaza Beach Club	3	4	4	48
The Plaza Chair House	3	4	4	48
The Sands Atlantic Beach	3	4	4	48
The Shores-Main Beach Club	3	4	3	36
The Shores-West Beach Club	3	4	3	36
Town of Hempstead Atlantic Beach, Beach Club	3	4	1	12
Vernon Chair House	3	4	5	60
Atlantic Beach Village Hall	3	3	3	27
Wastewater Treatment Plant	3	2.5	4	30
Wastewater Treatment Plant (Main)	3	3	5	45



## E. Endnotes

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## F. Glossary

ABE	Atlantic Beach Estates	LBBA	Long Beach Barrier Island
ABR	Atlantic Beach Rescue	LIPA	Long Island Power Authority
BFE	base flood elevation	LIREDC	Long Island Regional Economic Development Council
CBA	cost-benefit analysis	MAT	(FEMA) Mitigation Assessment Team
CDBG-DR	Community Development Block Grant – Disaster Recovery	NYRCR Program	New York Rising Community Reconstruction Program
CMP	Comprehensive Management Plan	NYS	New York State
Committee	NYRCR Planning Committee for Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach	NYS DEC	New York Department of Environmental Conservation
Community	NYRCR Community of Village of Atlantic Beach/Atlantic Beach Estates/East Atlantic Beach	NYS HCR	New York State Homes and Community Renewal
EAB	East Atlantic Beach	NYS DOS	New York State Department of State
FEMA	Federal Emergency Management Agency	PSEG	Public Service Electric and Gas Company
GIS	Geographic Information System	SART	State Agency Review Team
GABWRD	Greater Atlantic Beach Water Reclamation District	SBA	U.S. Small Business Administration
GOSR	Governor’s Office of Storm Recovery	Town	Town of Hempstead
HMP	Hazard Mitigation Plan	URS	URS Corporation
HVAC	heating, ventilation, and air conditioning	USACE	U.S. Army Corps of Engineer
LED	light-emitting diode	VAB	Village of Atlantic Beach
		Village	Village of Atlantic Beach





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