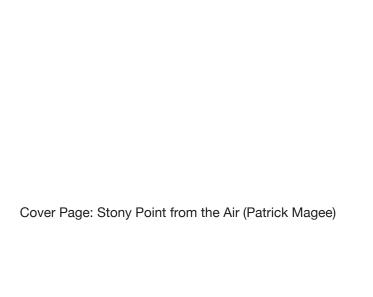




NY RISING COMMUNITY RECONSTRUCTION PLAN

March 2014

NY Rising Community Reconstruction Program



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This document was developed by the NYRCR Stony Point Planning Committee as part of the NY Rising Community Reconstruction (NYRCR) program within the Governor's Office of Storm Recovery. The NYRCR Program is supported by NYS Homes and Community Renewal, NYS Department of State, and NYS Department of Transportation. The document was prepared by the following consulting firms: AKRF, Inc.; CDM Smith, Inc.; and Sasaki Associates, Inc.













Foreword

Introduction

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) program¹.

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

^{1.} Five of the 102 localities in the program—Niagara, Herkimer, Oneida, Madison, and Montgomery Counties—are not funded through the CDBG-DR program.

traditionally underrepresented, such as immigrant populations and students. All planning materials are posted on the NYRCR Program's website (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.

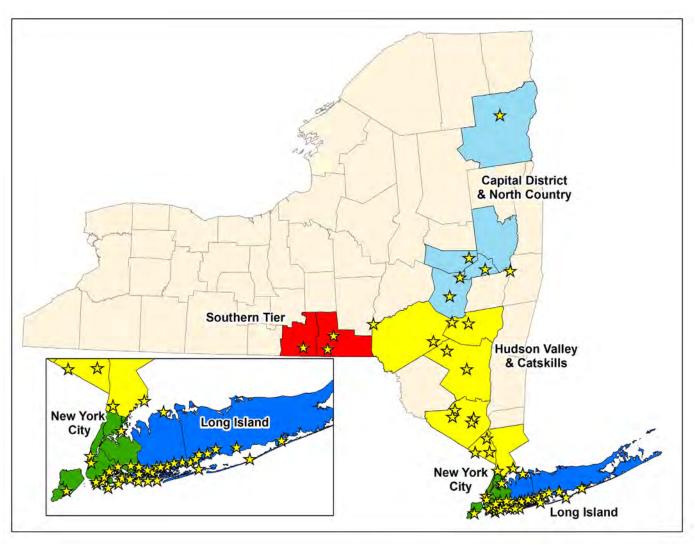
NYRCR Stony Point is eligible for up to \$3.0 million in CDBG-DR implementation funds.

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.

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.



Note: 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

I. Overview

The New York Rising Community Reconstruction (NYRCR) Program was established by Governor Andrew M. Cuomo to provide additional rebuilding and revitalization assistance to communities damaged by Superstorm Sandy, Hurricane Irene, and Tropical Storm Lee. This program empowers communities to prepare locally-driven recovery plans to identify innovative reconstruction and resiliency projects and other actions to allow each community not only to survive, but also to thrive in an era when natural risks will become increasingly common.

This Stony Point NYRCR Plan presents proposed programs, policies and construction initiatives developed by the Stony Point NYRCR Community and the Stony Point NYRCR Planning Committee, comprised of Stony Point residents chosen to represent the community.

Community Location and Allocation Amount

The Town of Stony Point is located in the Hudson Valley of New York State in Rockland County, approximately 30 miles north of New York City. Stony Point measures approximately 28 square miles and has a population of just over 15,000. The Town sits at the southernmost edge of the Hudson Highlands, on the west shore of the Hudson River. Stony Point is bordered to the south by the Town of Haverstraw and the Village of West Haverstraw; to the north and west by the Orange County towns of Highlands, Woodbury, and Tuxedo; and to the east by the Hudson River.

The Town of Stony Point is eligible for up to \$3 million in CDBG-DR funding through the NYRCR program.

Scope of Planning Area

The scope of the planning area includes all areas of the Town of Stony Point outside of Bear Mountain and Harriman State Parks. Some areas within the geographic scope were not directly damaged by Hurricane Irene, Tropical Storm Lee, or Superstorm Sandy, but include potential locations for resilient redevelopment, providing the Town the ability to relocate critical facilities out of flood-prone areas.

Summary of Storm Impacts

Hurricane Irene (August 28, 2011), Tropical Storm Lee (September 7, 2011), and Superstorm Sandy (October 29, 2012) hit Stony Point with full force. The storms brought heavy rains and/or significant storm surge with them, leading to record flooding along the Hudson River waterfront and in inland areas along the Cedar Pond Brook and other streams that run through the Town.

During Superstorm Sandy, storm surge and waves up to twelve feet in height struck Stony Point's Hudson River shoreline. Waterfront homes and businesses were damaged, in some cases severely. The Ba Mar mobile home park was hit especially hard, with many homes lifted off their footings, flooded, or otherwise damaged. At the many marinas along the river, buildings were damaged or destroyed; docks, some with boats still attached, were torn from their pilings and set afloat while moorings were pulled from the bed of the Hudson. Other businesses along the River experienced comparable levels of damage; some have not reopened. The wastewater treatment plant was partly flooded and some machinery was lost, although the sewage tanks narrowly avoided being inundated.

During Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy, the Cedar Pond Brook and other streams overflowed their banks, flooding homes and roadways and leading to severe erosion and infrastructure damage. Erosion of streambeds and banks exposed the Cedar Pond Brook interceptor sewer line, a major feeder line for the wastewater treatment plant. Although not damaged in the storm, this critical piece of infrastructure is still in imminent danger of experiencing a critical failure. Charles S. Eccher Lowland Park, an important recreational resource near the heart of the Town, was also flooded and suffered significant damage.

The physical damage to roads, bridges, homes, and other essential infrastructure compounded short and long term economic impacts that rippled throughout Stony Point and the region. Some storm victims lived for months in a temporary shelter facility, while others were forced to live elsewhere or reside in homes that remain damaged. Irreparable losses to waterfront homes and businesses and major damages to infrastructure complicated and delayed recovery efforts. Today, Stony Point is still recovering from the damage caused by Superstorm Sandy, Hurricane Irene, and Tropical Storm Lee.

Summary of Critical Issues

In the aftermath of Superstorm Sandy, Hurricane Irene, and Tropical Storm Lee, the key critical issues facing Stony Point include:

1. Lack of Emergency Preparedness

The recent storm events highlighted the need for better community awareness, education, and dissemination of information about how to prepare for, what to do, and where to go during storm events. Major gaps include bilingual materials on preparedness; access to real-time data during storms; signage and information on evacuation routes and locations of shelters and emergency services; information on recovery resources available to local residents; and improved communication between residents and government/emergency services providers.

2. Incomplete Recovery of the Hudson River Waterfront

Economic losses have slowed the waterfront's revitalization efforts and interrupted economic growth throughout Stony Point. Making these businesses more resistant to flooding and improving the resilience of Stony Point's waterfront economic assets through the implementation of best practices would improve the Town's ability to recover economically from future storm events. Additionally, many homes that were damaged by Superstorm Sandy, Hurricane Irene, and Tropical Storm Lee remain unrepaired since the storms; walls are missing, roofs have collapsed, yards are overgrown, windows and doors are boarded up and some are surrounded by hurricane fencing to protect residents. The result is that certain areas along the Hudson River waterfront have a blighted appearance.

3. Critical Assets Vulnerable to Flooding

Protecting residences, businesses, parks, natural resources, infrastructure, and energy resources from flooding, storm surge and wave action is critical to creating a resilient Stony Point. All of these resources have been affected during past storms. Additionally, the infrastructure in place to protect waterfront properties, including jetties, bulkheads, and seawalls, was damaged.

4. Uncertainty Surrounding Regional Energy and Infrastructure Projects

The community indicated that several regional infrastructure projects are proposed within the Town. Critical to the community and to the implementation of the NYRCR Plan is a better understanding of these projects, their location/route, and their potential short and long term effects.

5. Synergy Between Local and Regional Natural and Cultural Resources

Stony Point and the surrounding region are rich in natural and cultural resources that draw visitors from around the globe. The protection and promotion of these resources would increase tourism in the Town. This would improve the local and regional economy while emphasizing the need for protection of these resources and ultimately afford the Town the ability to promote resilient reconstruction and development.

II. Community-Driven Process

Community Vision/Goals

Stony Point NYRCR Community Vision for the Future:

Stony Point is a vibrant and connected riverfront and hillside community. Our Vision is to preserve our town's history and protect our people and our natural resources while making the community more resilient in the face of future hazards and attracting visitors to ensure an ecologically sound and economically strong future for the people of Stony Point.

Goals and objectives:

- ▶ Plan for better mobility and connectivity for people in cars, on foot, and with transit.
- ▶ Cooperate with other regional entities.
- Improve waterfront access and infrastructure.
- Protect the watershed and strengthen stormwater management practices.
- Redevelop historic assets while maintaining neighborhood fabric.
- ▶ Foster emergency readiness.
- ▶ Revitalize downtown businesses.
- Develop design and construction standards for resilience.
- ▶ Enhance historical, natural, and cultural attractions for tourists.
- Retain and attract residents with a range of housing options.

Summary of Public Outreach

The NYRCR Program is fundamentally a grass-roots initiative. Initial project recommendations were generated by the Stony Point NYRCR Planning Committee, which was comprised of local business owners, elected officials, civic leaders, and storm-impacted residents. The Committee met approximately every other week from September 2013 through March 2014. Materials were circulated to the Committee before and after each meeting and also posted to the NYRCR website. Committee members also created Facebook pages, posted relevant materials to their municipal websites, held additional meetings among themselves, and attended municipal meetings to report on their NYRCR Plan progress. Members of the Committee were instrumental in reaching out to vulnerable populations, particularly residents of the Ba Mar mobile home park, to include them in the NYRCR dialogue.

Three public engagement meetings were held throughout the eight month planning process, with a fourth to be conducted after the final plans are complete. These meetings provided the opportunity for Stony Point residents to learn about the NYRCR planning process, assets and projects, and provide input to help develop community-driven plans for a more resilient future. The format of the Public Engagement Meetings varied throughout the process, but generally included power point presentations, display boards and mapping, workgroups with maps and markers, survey sheets and comment boxes. A summary of the content for each public engagement meeting is provided on the next page.

Public Engagement Meeting #1

- Introduction to the NYRCR Program, project timeline, and progress-to-date; and
- Gather input on draft community vision, geographic scope, list of community assets, list of needs and opportunities, and local and regional project ideas.

Public Engagement Meeting #2

- ▶ Review Draft Conceptual Plan; and
- Gather feedback on Reconstruction Strategies and Projects.

Public Engagement Meeting #3

- Review the Risk Assessment process and results;
- Assess community support for and gather feedback on projects.

Public Engagement Meeting #4: Final Plan

- Present the Final Plans
- Review the selected projects, and the process and timeline for implementation.

III. Final Plan as a Blueprint for Implementation

The risks to, and vulnerability of, assets within the Town of Stony Point were exposed by Superstorm Sandy, Hurricane Irene, and Tropical Storm Lee. Through the NYRCR planning process, the community changed its focus from repair to resiliency. This change of purpose revealed significant opportunities to help Stony Point build back better.

The Committee first identified where the Town is vulnerable, where its critical assets are located and the risks those assets face. To address these specific vulnerabilities, a comprehensive needs and opportunities analysis was prepared through a combination of research, analysis, and feedback from the Committee and the community.

The NYRCR Plan provides an overview of Stony Point and its risks, vulnerabilities, needs and opportunities. Strategies for reconstruction and resilience were developed as an approach to meet the identified needs and a way to put the related opportunities into action. To address the risks and respond to the needs, projects were developed to execute the reconstruction and resiliency strategies. These projects include short-term actions (Proposed and Featured Projects) that most effectively implement identified opportunities. Other actions (Additional Resiliency Recommendations) that could further the Town's goals of reconstruction and resilience were also identified. All projects are included in this plan.

Proposed Projects are proposed for funding through a 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 resiliency projects and actions that the Stony Point NYRCR Planning Committee would like to highlight, but are not categorized as Proposed or Featured Projects.

Proposed and Featured Projects

The strategies presented in the table below, and the Proposed or Featured Projects that implement them, specifically address the stated needs and transform opportunities into action items. The strategies were developed to concentrate resiliency planning efforts toward resolving critical issues identified throughout the planning process. The Proposed and Featured Projects are presented in conjunction with the strategy that they fulfill; they are not presented in any particular order of priority.

Strategy	Project Name	
Strategy 1: Strengthen current short- and long-term emergency shelters	Letchworth Village Disaster Recovery and Communications Center	
and develop new sheltering opportunities	Stony Point Center Retrofit	
Strategy 2: Encourage economic development and support existing businesses	Grassy Point Development/Redevelopment	
Strategy 3: Improve on existing emergency preparedness, response and communications	Letchworth Village Disaster Recovery and Communications Center	
Strategy 4: Provide information and assistance to homeowners with pre-storm flood-proofing and post-storm repair, buyouts and demolition	Demolition of Damaged and Abandoned Structures	
Strategy 5: Promote sustainability and resilience through local land use planning and regulation	Grassy Point Development/Redevelopment	
	Hardening of Wastewater Treatment Plant	
Strategy 6: Repair, rehabilitate, upgrade and fortify critical infrastructure	Rehabilitation of Wastewater Interceptors along Beach Road and the Ba Mar Sewer Line	
and transportation	Shoreline Protection Against Erosion and Wave Action (Beach Road)	
	Shoreline Protection Against Erosion and Wave Action (River Road)	
	Cedar Pond Brook Interceptor Sewer Line Rehabilitation	
Strategy 7: Harness resiliency potential of natural resources	[No Proposed or Featured Projects affiliated with this strategy]	



2014 NY RISING COMMUNITY RECONSTRUCTION PLAN

NYRCR STONY POINT

Section I
Community Overview





Community Overview

A. Introduction to Stony Point

The Town of Stony Point is located in the Hudson Valley of New York State in Rockland County, approximately 30 miles north of New York City. Sitting at the southernmost edge of the Hudson Highlands, and with 10 miles of scenic Hudson River waterfront, Stony Point has always been defined by its landscape of river and mountains, which has drawn people here for hundreds of years.



Fall colors in Stony Point (Alice Brown)

During Colonial times, the area that is now Stony Point was a crossroads between New England and the southern colonies because of the King's Ferry, a critical ferry crossing over the Hudson river. The plaque at the site of the landing indicates the King's Ferry was "...a vital communication link between New England and the Colonies to the South" and that it was used by George Washington and the French Army during the Revolutionary War.

Beyond anchoring one end of this important ferry route, the town played an important role in the

American Revolution. The rocky promontory for which the town is named was the location of a British fortification that was captured by General "Mad" Anthony Wayne's forces in the Battle of Stony Point in 1779, a major victory for the Americans. The following year, Major John André of the British Army met with American general Benedict Arnold in what is now Stony Point to discuss Arnold's plans to defect to the British and turn West Point over to the British Army. Fortunately for the Americans, André was captured shortly afterward and the plot was exposed. Then, in 1781, American and French forces on their way to the Battle of Yorktown passed through Stony Point after crossing the Hudson at the King's Ferry. This Revolutionary War history is commemorated at the Stony Point Battlefield State Historic Site, a major tourist attraction for the town.



King's Ferry Landing Plaque (Steve Beckerle)

After the revolution, rural settlements continued to grow and the Town of Stony Point was officially

founded in 1865. The young township was home to a number of industries. At first the local economy relied on harvesting raw materials such as oysters and sturgeon from the Hudson, but soon, clay deposits were discovered and Stony Point became an important center of brickmaking in the region. In the twentieth century, this industrial heritage was built on and continued with the establishment of the Kay Fries industrial park in downtown Stony Point, the Lovett Power Plant and Tilcon quarry in Tomkins Cove, and the U.S. Gypsum plant in Grassy Point.



Stony Point Battlefield State Historic Site (Chris Robbins)

In addition to its important role in industry, the Town has long been a rural haven for city dwellers. In the 1800s, Iona Island was particularly popular as a resort and weekend picnicking spot for people from the more urbanized areas downriver. However, in 1899 this recreational activity ended when the island was bought by the U.S. Navy for use as a naval ammunition depot, which remained in service until 1947. The state currently uses some of the remaining buildings for storing archives. Today the island is a bird sanctuary and bald eagle nesting ground, with special permission needed from the Palisades Interstate Park Commission to enter the main portion of the island. In the early decades of the twentieth century, the fledging environmentalist movement led to the founding of Harriman and Bear Mountain State Parks, both located partly in Stony Point. These resources,

combined with the construction of the Bear Mountain Inn and Zoo, solidified Stony Point's reputation as a hiker's paradise and natural getaway close to New York City and continue to bring tourism to the town today. Over time, as the heavy industry and manufacturing facilities that long formed the backbone of Stony Point's economy began to close their doors, the economy shifted, with tourism claiming a larger portion of the town's economy. Today many waterfront businesses, such as marinas and a boat works, have added another layer to the tourism and recreation industry in Stony Point, building on the historical sites and State Parks previously mentioned.



Sunrise on the Stony Point Waterfront (Thomas McGuire)

Today, Stony Point has a population of just over 15,000 residents as of the 2010 Census, spread over approximately 28 square miles. Two thirds of this land area is contained within Bear Mountain and Harriman State Parks, which lie in the northern and western areas of the Town along the ridge and slopes of the Hudson Highlands. The remaining third of the Town's landmass, in the southeastern portion of Stony Point, is developed at a generally suburban to rural scale, with higher-density neighborhoods and commercial and industrial areas clustered along NYS Route 9W (at the very southeast corner of the Town), in the Stony Point Town Center and the Grassy Point neighborhood, which is where much of the Town's Hudson River waterfront activity is located. The Town is

bordered to the south by the Town of Haverstraw and the Village of West Haverstraw; to the north and west by the Orange County towns of Highlands, Woodbury, and Tuxedo; and to the east by the Hudson River.

Stony Point is vulnerable to flooding from both storm surges along the Hudson River and riverine flooding on the streams that run down from the Hudson Highlands, including Cedar Pond Brook, Minisceongo Creek, and several unnamed streams and tributaries. The confluence of several streams is located adjacent to Grassy Point and as a result this area has seen some of the worst flooding the Town has experienced. However, areas throughout the Town have suffered impacts from storms through the years. Stony Point is somewhat unique among the NY Rising Communities in that it sustained damage both in upland areas, where creeks flooded their banks during Hurricane Irene and Tropical Storm Lee, and along the waterfront, where storm surge and wave action were the main factors during Superstorm Sandy.

B. Geographic Scope of NYRCR Plan

Defining the physical extent of the area that the NYRCR planning process would address was the key first step taken by the Stony Point NYRCR Planning Committee. This planning area, called the Geographic Scope, was intended to encompass areas within the Town that contain resources critical for the community's response to storm events, the Town's economic drivers, and other important assets. The Geographic Scope also needed to include those locations that have a history of flooding. In developing the Geographic Scope, the Committee considered locations that are most vulnerable and where assets are most at risk; areas where future development or redevelopment will be discouraged and encouraged; and areas where additional economic investment will help the communities' financial resilience.

"Assets are likely to be most at risk due to future storms in the extreme, high and moderate risk areas of the community. But reviewing current and previous storm damage may indicate that other areas should be included [in the Geographic Scope]."

Guidance for New York Rising Community Reconstruction Plans, A Planning Toolkit for CR Planning Committees (2013)

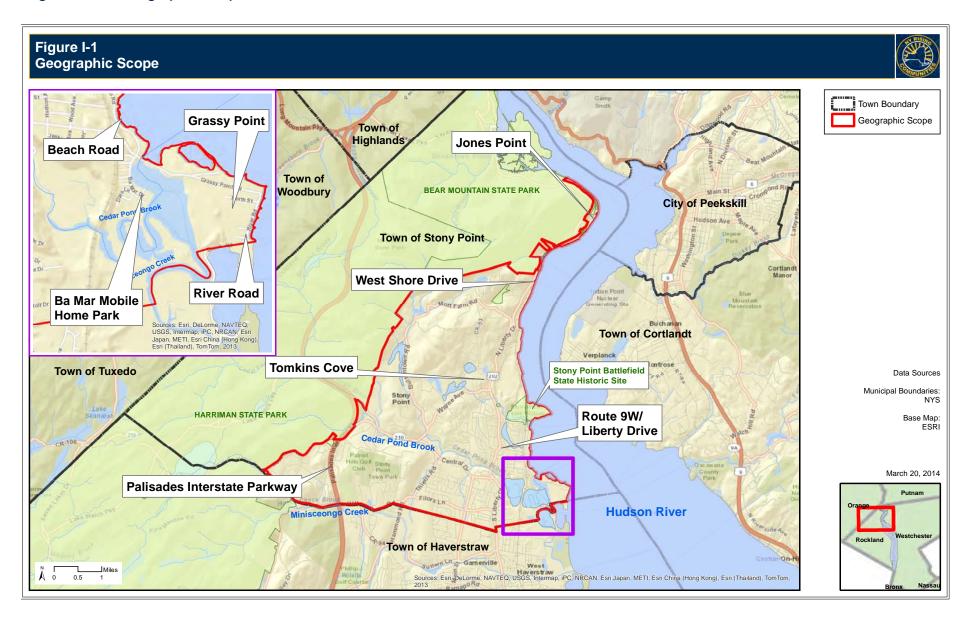
The Geographic Scope of this NYRCR Plan includes all areas of the Town that are outside of Bear Mountain and Harriman State Parks. Some areas within this Geographic Scope are areas that were not directly damaged by Hurricane Irene, Tropical Storm Lee, or Superstorm Sandy, but which include locations for redevelopment, providing the Town the ability to move various facilities out of the path of future damage. This geographic study area forms the basis for all subsequent steps of the NYRCR planning process, including the analyses that led to the asset inventory, needs and opportunities, risk assessment, strategies, and projects. The final Geographic Scope is depicted in Figure I-1.



Members of the Public review the Geographic Scope, Public Engagement Meeting #1 (Alice Brown)

Discussion on how to determine the Geographic Scope began at the first Committee meeting. Initial conversations revolved around several options. A

Figure I-1 Geographic Scope



Geographic Scope that included the entire Town was rejected because the State Parks do not contain any populated areas, critical assets or areas where flood damage was identified. A smaller Scope covering only the areas that were directly inundated was deemed too narrow, as it would not have included key locations such as storm shelters, major public buildings, and the majority of the Town's neighborhoods. In the end it was determined that since the entire population of the Town had been affected by Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy, and because even those areas not directly impacted by flooding contained important recovery and resilience assets, the Geographic Scope should include all populated areas of the Town.

The Geographic Scope developed by the Committee was endorsed by the broader Stony Point community during the first of four Public Engagement Meetings held throughout the NYRCR process. More information about public outreach can be found in Section V.C. "Public Engagement Process."

C. Description of Storm Damage

Hurricane Irene and Tropical Storm Lee

On August 27-28, 2011, Hurricane Irene struck the Hudson Valley, bringing with it heavy rains and significant storm surge to Stony Point. A County emergency was declared in advance of the storm, and evacuations were recommended for low-lying areas including Grassy Point, Beach Road, the Ba Mar mobile home park, West Shore Drive in Tomkins Cove, and Jones Point. As the storm moved closer, the evacuation was made mandatory and was enforced by local police. The North Rockland High School and Rockland Community Field House were designated as storm shelters.

The storm surge inundated nearly the full length of Beach and River Roads, as well as all but the very center of Grassy Point and approximately half of the Ba Mar mobile home park. Homes and businesses were flooded by the Hudson River as the storm pushed water shoreward, filling basements and destroying possessions as well as the mechanical equipment typically located below grade. One resident, who was tending to an issue in his basement, had to be pulled to safety when the foundation of his home collapsed.



Hurricane Irene knocked oil tanks off their foundations at Wayne Cort's Marina (Kevin Maher)



Oil slick from fuel tanks after Hurricane Irene (Kevin Maher)

People returning to their homes found mud-filled basements, debris strewn about their yards, and damage both in and outside of their homes. In the upland areas of the Town, soils that were already saturated in advance of the storm could hold no more water, and heavy rains led Cedar Pond Brook and its tributaries to overflow their banks and flood roads near the Palisades Interstate Parkway, blocking access to all, including emergency vehicles.



Flooding from the Cedar Pond Brook during Hurricane Irene undermined foundations of nearby homes (Kevin Maher)

Stream bank erosion on the Cedar Pond Brook exposed an eight-inch gas line, flooded many of the homes in the Cedar Flats Mobile Home Park and washed away a portion of Cedar Flats Road. Residents north of the washed-out road had to travel many miles out of their way to get to and from their homes.



Tree uprooted by Hurricane Irene floodwaters on Cedar Pond Brook (Kevin Maher)

Other roads across the Town were flooded or washed out, especially in areas where they ran parallel to an existing stream, where a culvert conveyed a stream under the pavement, or where they were located in low-lying areas. During the storm, culverts that had just been cleared became clogged with debris carried out of the highlands by the raging flood waters. In one such location, at the intersection of Sullivan and Lewis Drives, the water filled yards, covered the roads and seeped into homes resulting in the need to rescue a pregnant woman trapped on her porch.

Flood waters from the Cedar Pond Brook destroyed the parking lot at the Pyngyp School, a historic building listed on the State and National Registers of Historic Places, as well as a portion of a single-family home located on the banks of the Brook.

As for economic impacts, the marinas and other marine services business along with Gilligan's on the Hudson, a waterfront restaurant, were flooded and had to be closed for varying lengths of time. Patriot Hills Golf Club was flooded as well. Sand traps were washed away and the course was closed for two and a half days. Tropical Storm Lee, which followed on the heels of Hurricane Irene, resulted in additional business impacts including the closure of the Golf Club for another day and a half.

Scars of the raging floodwaters are still visible along the watercourses that flow through Town. This is especially so for certain reaches of the Cedar Pond Brook whose banks were undermined and severely eroded, leaving nothing but bare soil and fallen trees in its wake.

Possibly the worst effects of Hurricane Irene and the flood waters conveyed by the Cedar Pond Brook were felt by the residents of Stony Point in the loss of Charles S. Eccher Lowland Park. This recreational resource included horseshoe pits, a pavilion, picnic tables, a playground, grills, a walking track, basketball courts and a kiddie pool; many of these amenities were washed away or suffered significant damage. Cedar Pond Brook runs directly through this park and

while the park has been rebuilt, the erosive force of the water is still evident on the banks of the creek.



Erosion of Cedar Pond Brook Stream Bank after Hurricane Irene (Kevin Maher)



Flooding at Charles S. Eccher Lowland Park after Hurricane Irene (Luanne Konopko)

Superstorm Sandy

As Superstorm Sandy approached the Hudson Valley on October 29, 2012, states of emergency were again declared by the County and Town, and notices were sent to Stony Point residents urging prudence and caution during the storm. Areas of the Town adjacent to the Hudson River waterfront were evacuated, including all of Grassy Point and the Ba Mar mobile home park. The evacuation order affected

approximately 35 people along Beach Road and many more in the other sections of the evacuation zone. A shelter for the evacuees was set up in the Stony Point Ambulance Building nearby.

Damages sustained during the storm, the result of flooding from storm surge (over 4 feet) and substantial wave action, were especially significant due to a concurrence of the high tide and full moon. Unlike Hurricane Irene, when water was pushed up on land due to tidal fluctuations in the Hudson River and the tributary streams, the floodwaters caused by Superstorm Sandy were fueled by a combination of unusually high tides resulting from lunar cycles and hurricane force winds that pushed water up the Hudson River.

Superstorm Sandy did not follow a traditional storm track to the northeast along the shoreline of Long Island and New England, as Hurricane Irene did. Instead, Superstorm Sandy made a left-hand turn and made landfall near the midpoint of the New Jersey coast, subjecting the lower Hudson Valley and the New York City metropolitan area to the worst part of the hurricane, the northeast quadrant, where the maximum winds were prevalent. Despite the natural flow of water down the Hudson River, these winds churned up the waters and sent huge waves rolling up towards Stony Point's shoreline. Unlike Hurricane Irene, where floodwaters were a combination of high tides and heavy runoff (the NOAA station at nearby Yorktown Heights, NY recorded 6.65 inches of rainfall from Hurricane Irene), Superstorm Sandy's winds roaring out of the southeast slammed massive waves up to 12 feet in height against the shoreline, decimating buildings and damaging infrastructure located in these areas. The waves turned boats, docks, tree limbs, timber and other debris into battering rams, driving them into homes, outbuildings, and businesses on the shorefront. A fishing shanty and a gazebo, both along the river, were ripped from their foundations, never to be seen again. Some of the residents who stayed behind hoping to weather the storm banded together in an attempt to prevent floating debris from striking their homes.



Storm damage to boat docks, Superstorm Sandy (Jim McDonnell)



Storm surge on Beach Road during Superstorm Sandy (Luanne Konopko)

Many older properties along the waterfront, which had not been raised to the FEMA-recommended flood elevation of eight feet above the river, experienced serious damage; some are still not habitable. Nine homes and one garage, used to store old fire trucks, along Beach Road were damaged. The same was the fate for a total of thirteen homes along River Road as well as all of the residences located on First, Fourth and Fifth Streets in Grassy Point and a majority of those sited on Grassy Point Road. Damage sustained included flooding of basements and first floors; in some cases, porches, decks and even the fronts of houses were ripped away, exposing kitchens and

living rooms to the fury of the storm. Where the structure of the houses withstood the punishment, doors and windows facing the river were blown out, inviting the rushing waters in. One resident, who had prepared for Superstorm Sandy as he had for Hurricane Irene—by sandbagging and boarding up the front of his home—stayed behind. When the storm breached the front of his house and waist-deep water rushed though and out the back, he found himself trapped on the second floor with water all around and rising.

In another waterfront home on Beach Road, several people who decided to wait out the storm had to be evacuated after waves crashed through the front of the house, leaving them no means of escape. The Police and Fire Departments secured their safety through a second-story window at the back of the home; this was the only safe means of access, as the emergency workers were able to position their vehicles on high ground behind the home and away from the flood waters. One resident lost his life helping to secure a marina facility.



Damaged housing in Ba Mar after Superstorm Sandy (Luanne Konopko)

The Ba Mar mobile home park experienced flooding and wave damage similar to what was seen in other areas of the waterfront. This neighborhood is very vulnerable due to its location in a low-lying waterfront area, and as a result of the nature of the homes and their construction. Many of the homes in Ba Mar were

lifted off their footings, flooded, or otherwise damaged. Possessions were destroyed and automobiles, outdoor furnishings, and unsecured structures were washed away or lost due to water damage. Approximately 70 homes in this community were heavily damaged (loss of 50% of their value or greater).

Numerous marinas and boating service businesses were severely impacted. Buildings were damaged or destroyed; docks, some with boats still attached, were torn from their pilings and set afloat while pilings and moorings were pulled from the bed of the Hudson. At one of the marinas, workers put up a barrier in a last ditch effort to prevent boats from causing destruction to the homes located just across the road. Despite these efforts and others like them up and down the Hudson River, boats were deposited in people's yards, crashed into the fronts of their homes, and were stranded on tops of fences. Some were from local marinas, while others were conveyed from the opposite shore or far upriver. While docks and buildings within the marinas have been rebuilt, six structures remain damaged and two have been torn down.



Boats piled up at the Stony Point Bay Marina after Superstorm Sandy (Luanne Konopko)

At the PANCO Petroleum site, empty tanks were floated off their foundations, their connections broken. The restrooms and pier at River Front Park were washed away leaving not a trace.

At the wastewater treatment facility, as storm surge advanced toward the plant, the worker who was attempting to keep the plant operational received instructions to shut off power and disable the emergency generators so that they would not start up when the building was flooded. After securing the building, he had to be plucked from its roof by two Town employees, at risk of their own lives, in the Highway Department's front end bucket loader. The plant itself experienced flooding in the basement of the main control building and several pump motors and other miscellaneous electrical items were lost, although the sewage tanks narrowly avoided being inundated. Businesses along the Hudson were also damaged, including all of the marinas and two restaurants: Gilligan's on the Hudson and Out of the Blue. Gilligan's has reopened, but Out of the Blue will not.

During Superstorm Sandy, the Cedar Pond Brook and its tributaries flooded, as they had during Hurricane Irene. As a result of the unusually high tide and significant storm surge, erosion of streambeds and banks exposed additional sections of the Cedar Pond Brook interceptor sewer line, adding to sections that had been uncovered during previous storms. While the sewer line itself fortunately did not suffer any immediate damage, it was discovered a short time later that a siphon which carried the sewer flow under the Cedar Pond Brook immediately downstream of this line had in fact been damaged by rocks that had slipped off the embankment and cracked the top of the pipe. The siphon had obviously been exposed due to the erosive water flows from Hurricane Irene and Superstorm Sandy. Had this sewer line been breached, it would have discharged raw sewage directly into the Cedar Pond Brook less than a mile upstream from public parks, fishing and bathing areas, and critical habitat areas of the Hudson River.

In the aftermath of the storm, New York Governor Andrew M. Cuomo declared a disaster in Rockland County. Some storm victims lived for months in a long-term shelter that was set up at the Stony Point Center in the days after the storm. Aside from the shelter, Town recovery efforts included conducting a

survey of damaged properties and distributing dry ice to residents so they could keep their food supplies fresh until electricity was restored.



Out of the Blue, a waterfront restaurant damaged by Superstorm Sandy, has not reopened (Chris Robbins)

The effects of the storm are evident to this day. Residents of the Ba Mar community continue to live elsewhere or reside in homes that remain damaged. Debris, including the roof of the gazebo that was washed away and a blanket knitted by one of the displaced residents, still litter the front lawn of one abandoned home. There are many homes that are unsafe for habitation and remain partially boarded up. Some of these you can look into or straight through as doors, windows and walls are missing. Recently, the roof of one home collapsed, and two others have been demolished by the owners. At this time only one home has been raised above the recently issued Federal Emergency Management Agency advisory base flood elevations.

In response, the community has rallied around and supported those who have experienced significant loss as a result of Superstorm Sandy. Over the past two years a large group of motorcyclists periodically ride out to River Road and gather around one of the homes that remains boarded up. A sermon is given from the front porch of the home to remind all that the recovery is ongoing.



Motorcyclist rally on River Road (Dominick Posillipo)

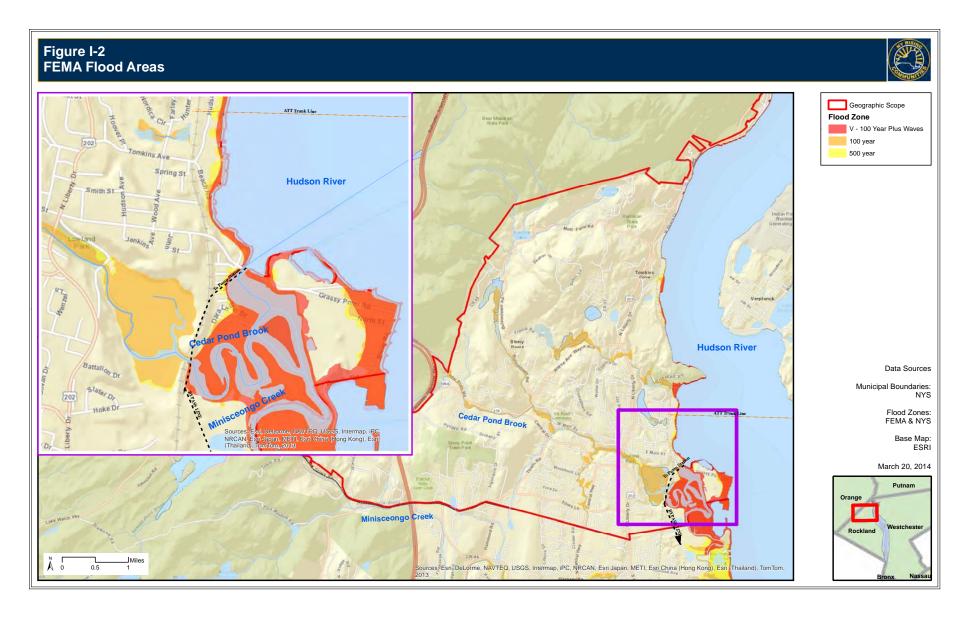
Affected residents of Stony Point were also supported by the Stony Point Seals, a nonprofit group that organizes an annual swim in the Hudson River on Super Bowl Sunday. The Seals contributed money raised at the 2013 "Polar Plunge" to local victims of the storm.

Other Storms

While these storms are among the most significant disasters that have occurred in Stony Point in recent memory, they are hardly alone. Stony Point is regularly affected by lesser storms and flooding events. Along Beach Road, flooding occurs at least once every Spring Tide with or without storm surge or precipitation. River Road and the Ba Mar neighborhood are also regularly affected by these smaller storms and floods.

In the Northeast, particularly in the New York metropolitan region, rainfall events have become more frequent and more intense as a result of climate change. Due in part to the surrounding topography, inland flooding is triggered by heavy rainfalls and results in the inundation of low-lying areas and the erosion of stream banks and creek beds. The existing storm drainage network, consisting of pipes buried beneath existing streets and culverts under roads and bridges. is frequently overwhelmed by this runoff. In some cases, this infrastructure is deteriorating due to aging and environmental factors. Like other Hudson River

Figure I-2. FEMA Flood Areas



communities, the drainage systems in the Town of Stony Point were designed and built at a time when less intense rainfall events occurred. New rainfall patterns expose these systems to greater volumes of runoff on a regular basis, leading to flooding, erosion and property damage.



Superstorm Sandy Aftermath (Jim McDonnell)

Another factor that has led to recent flooding events is the intensity of development within the watershed. This development occurred mainly before modern stormwater management guidelines were established in Stony Point. Replacement of undeveloped areas, including floodplains, and wetlands with impervious development has removed important natural runoff control normally seen in undisturbed natural areas such as Harriman and Bear Mountain State Parks. Stony Point has been and will continue to be susceptible to both coastal surges and flooding from inland precipitation.

Figure I-2 presents FEMA flood areas for Stony Point and provides geographical context to the devastation caused by water overflowing the banks of the Hudson River, the Cedar Pond Brook, tidal wetlands and other unnamed watercourses.

D. Critical Issues

The Committee and members of the community communicated, in sobering detail, the impacts brought to bear on their Town by Superstorm Sandy, Hurricane Irene and Tropical Storm Lee. The picture painted was one of struggle, loss, tragedy and heroics during the storm events followed by an outpouring of support, outreach, and kindness provided by many in the immediate aftermath and beyond. Some of the critical issues facing the community and region related to these unprecedented storm events were immediately evident to all. Others were only fully formulated and accurately described during the NYRCR process.

Critical issues were also identified by residents during public engagement events where attendees openly discussed concerns that arose from their own experiences with these storms. This input was used to build on the critical issues developed by the Committee. The critical issues identified by the community affect the Town's resilience and overall ability to withstand and recover from significant storm events. The critical issues facing Stony Point include:

1. Lack of Emergency Preparedness

The recent storm events highlighted the need for better community awareness, education, and dissemination of information about how to prepare for, what to do, and where to go during storm events, including:

- Bilingual materials explaining how residents should prepare their homes, properties, persons, and businesses in advance of a storm event are lacking.
- ▶ The paucity of information and inability to access critical, real-time data on road closures, power outages, flooding, evacuation routes, and ways to receive or provide assistance hindered the community's response.
- Improved signage and materials providing residents with instructions on safe evacuation routes. emergency shelter sites, locations of food and

medical services promoting a more orderly and efficient response are needed.

- Residents were concerned with the lack of access to information providing direction on where to go and the options for assistance with temporary shelter, replacement of lost property, and funding for the repair, rebuilding or buy-out of damaged or lost property.
- Improving the means and methods of communication and linking residents to critical information disseminated by the government and emergency service providers was identified as an ongoing issue.

The residents evacuated and rescued during the storm events were taken to the basement of the police station which also houses the Town's emergency response center. As a result, the police station was overcrowded and there was insufficient room and services for the all of the displaced residents needing assistance and accommodations. Further, the presence of residents in areas where emergency response was being coordinated created additional challenges for emergency services providers. During Superstorm Sandy, displaced residents were then moved to the



Houses along the Waterfront (Chris Robbins)

Stony Point Center, which provided food and temporary shelter for many families, some for up to three months. The Stony Point Center itself experienced flooding and power outages during the

storms, temporarily limiting its ability to provide needed services. Critical to the Town's ability to provide adequate recovery services is the development of adequate and accessible emergency shelters for safe haven during storm events.

2. Incomplete Recovery of the Hudson River Waterfront

As described earlier, the storms resulted in damage to critical economic resources, such as local businesses, marinas, restaurants and more. These impacts negatively affected tourism to the waterfront and the lost economic activity further hampered the businesses' ability to recover quickly. The cumulative effects of all these losses have slowed the waterfront's revitalization efforts and interrupted economic growth throughout Stony Point. Making these businesses more resistant to flooding and improving the resilience of Stony Point's waterfront economic assets through the implementation of best practices would improve the ability of Stony Point to recover economically from future storm events.



Superstorm Sandy Storm Surge (Jim McDonnell)

Additionally, many single-family residences along the Hudson River waterfront were damaged or destroyed during Hurricane Irene and Superstorm Sandy. These homes were built in flood-prone areas and/or areas susceptible to wave action, increasing their

vulnerability to storm damage. Housing stock that was damaged included mobile homes, apartments, and historic homes dating back to the 1800s. The common factor among all of these homes was a lack of resilient design and construction. Many of these homes remain unprepared since the storms; walls are missing, roofs have collapsed, yards are overgrown, windows and doors are boarded up and some are surrounded by hurricane fencing to protect residents. The result is that certain areas along the Hudson River waterfront have a blighted appearance.

3. Critical Assets Vulnerable to Flooding

Protecting residences, businesses, parks, natural resources, infrastructure, and energy resources from flooding, storm surge and wave action is critical to creating a resilient Stony Point. All of these resources have been affected during past storms. Houses and businesses were damaged and destroyed; natural and cultural resources including waterfront and creekside parks were temporarily closed and/or suffered loss of facilities due to flooding; wastewater conveyance and treatment systems were inundated and had to be shut down; the supply of electricity was interrupted due to the exposure of transmission lines when stream banks were eroded; and access to certain areas of the town was cut off as a result of roads being flooded or washed away. The Cedar Pond Brook



Stony Point Ambulance Corps (Alice Brown)

sewer line is at serious risk of collapse, largely due to the overwhelming amount of stormwater runoff which has eroded the sewer line's protective berm and exposed its support structure to the elements. Additionally, the infrastructure in place to protect waterfront properties, including jetties, bulkheads, and seawalls, has been repeatedly damaged.

4. Uncertainty Surrounding Regional Energy and Infrastructure Projects

The community indicated that several regional infrastructure projects are proposed within the Town. Critical to the community and to the implementation of the NYRCR Plan is a better understanding of these projects, their location/route, and their potential short-and long-term effects. For example, the Committee is concerned about the proposed Champlain Hudson Power Express (CHPE) project, which may be constructed along the waterfront and could affect local land uses including the Waldron Revolutionary War Cemetery and the Ba Mar mobile home park, a low-income community.



Damaged Boat Dock after Superstorm Sandy (Jim McDonnell)

5. Synergy Between Local and Regional Natural and Cultural Resources

Stony Point and the surrounding region are rich in natural and cultural resources that draw visitors from around the globe. These include the Stony Point Battlefield State Historic Site, Bear Mountain and Harriman State Parks, West Point, Iona Island, nesting and wintering bald eagles and other wildlife, and the Hudson River. The community stated that a critical issue is the protection and promotion of these resources to increase tourism in the Town and encourage those who visit to stay for longer periods of time. This would improve the local and regional economy while emphasizing the need for protection of these resources, and would ultimately afford the Town the ability to promote resilient development of the waterfront and beyond.

E. Community Vision

The Vision Statement for the Stony Point NY Rising Community was developed by the Committee with input from the community. The Vision Statement relies heavily on Committee members' familiarity with Stony Point, the needs of the community relative to the NYRCR study area boundary, and previous planning efforts. A draft of the Vision Statement was shared with the public at the first Public Engagement Meeting; feedback from that meeting was extremely important in finalizing the Vision Statement. More information about public outreach can be found in Section V.C. "Public Engagement Process."

Through the visioning process, the Committee and the Public worked to identify, assess, and conceptualize local and regional opportunities for Stony Point. There was general agreement that the vision statement needed to not only describe the Stony Point of the future, but also needed to identify specific ways to attain that vision. Hence, the Committee and the Public outlined short, medium, and long range goals to help Stony Point build back better. These goals were developed to address education, emergency

preparedness, resilience, partnerships, and natural resource protection.

Extra care was taken in crafting language about "making the community more resilient in the face of future hazards." Preliminary drafts of the vision statement had included the statement "preparing for flooding," but there was Committee concern that this was too negative and too limiting. By broadening the statement to include a range of possible hazard conditions and a focus on resilience rather than disaster preparedness, the vision makes a much more positive statement about Stony Point's future. Other topics that came up in the Committee's vision discussion included the importance of the waterfront as an "engine of opportunity" for the community and the value of historic and natural resources as attractions for tourists.



Boats in the Stony Point Harbor at Dusk (Chris Robbins)

Residents who provided feedback on the draft Vision Statement at the public engagement meeting also emphasized the importance of having the Statement focus on the people of Stony Point, rather than just the Town's economy and natural resources. Resident comments also included the importance of improved mobility and transit and the duality of Stony Point's identity as both a mountainside and riverside community.

The final Vision Statement and goals are as follows:

Stony Point is a vibrant and connected riverfront and hillside community. Our Vision is to preserve our town's history and protect our people and our natural resources while making the community more resilient in the face of future hazards and attracting visitors to ensure an ecologically sound and economically strong future for the people of **Stony Point.**

Goals and objectives

- ▶ Plan for better mobility and connectivity for people in cars, on foot, and with transit
- Cooperate with other regional entities
- Improve waterfront access and infrastructure
- Protect the watershed and strengthen stormwater management practices
- Redevelop historic assets while maintaining neighborhood fabric
- Foster emergency readiness
- Revitalize downtown businesses
- Develop design and construction standards for resilience
- ▶ Enhance historical, natural, and cultural attractions for tourists
- Retain and attract residents with a range of housing options

F. Relationship to Regional **Plans**

The storms and resulting damage from Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy highlighted the need for coordinated planning initiatives and policies that can significantly contribute to long-term regional resilience. Many regional planning

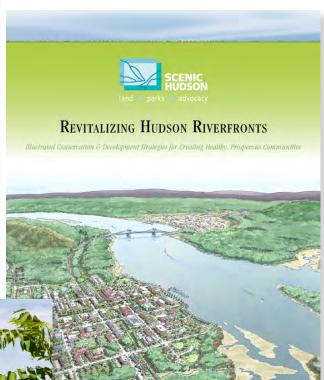
efforts have been undertaken both before and after the storms in the Mid-Hudson Region and in Rockland County. In 2013, the Mid-Hudson Regional Sustainability Plan was released, laying out short-, mid-, and long-term goals and strategic priorities for the region's development. The Mid-Hudson Regional Economic Development Council also released a 5-Year Strategic Plan in 2011, which presented specific goals for the regional economy. In addition, Rockland County developed a Comprehensive Plan in 2011 and a Hazard Mitigation Plan in 2010.

These pre-existing regional planning efforts served as the genesis for many projects that were identified though the NYRCR process. Although Committee members were tasked with representing the interests of Stony Point, they became increasingly aware of the importance of planning in a regional context. Community members worked together to create strategies that were consistent with and supportive of regional goals, including planning for the effects of severe storms and flooding. Many of the regional planning documents, including the "Rockland Tomorrow" Master Plan and the Mid-Hudson Regional Sustainability Plan, identified the need for focused coordination and cooperation among communities to achieve their goals. This sentiment is echoed by the Committee and their willingness to work toward the common goal of mitigating future flood damage and creating a more stable and climate resilient local and regional economy.

The key for the Stony Point NYRCR Planning Committee was to identify initiatives that would not duplicate previously completed plans, and to extract the initiatives, policies, projects, and programs that had not yet been implemented, addressed critical needs, and were critical to longterm resilience.

Table I-1 presents a list of available local and regional planning documents and resources considered. These documents were reviewed for information and data





A selection of regional plans reviewed by the Committee: Rockland Tomorrow (2011), Revitalizing Hudson Riverfronts (2010), and the Mid-Hudson Regional Sustainability Plan (2013)

Table I-1 **Regional Plans**

Plan Name	Shared Regional Plan Goal(s)	Relation to the NYRCR Stony Point Plan
Rockland County Plans		
Rockland Tomorrow: County Comprehensive Plan (2011)	Recommends actively promoting the Hudson River as a vital regional resource, and conserving its environmental and scenic quality as well as maintaining physical and scenic access to the greatest extent practicable	Promotes access to the waterfront for both tourists and residents Promotes water dependent uses along the Hudson River Encourages creation of waterfront open space Promotes pedestrian access and public transportation connection to the waterfront.
Rockland County Hazard Mitigation Plan (2010)	Promote disaster-resistant development Build and support local capacity to enable the public to prepare for, respond to, and recover from disasters Reduce the possibility of damage and losses due to flooding caused by floods, hurricanes and nor'easters, and storm surge Reduce the possibility of damages to emergency and critical facilities from damage due to flooding, wildfires, and extreme winds	Promotes resilience in development and redevelopment Promotes the development and enhancement of evacuation centers and storm shelters Promotes storm preparedness and awareness through public outreach and education Promotes the rehabilitation and retrofitting of at risk infrastructure
Mid-Hudson Region Plans		
Cleaner, Greener Communities Mid-Hudson Regional Sustainability Plan (2013)	Recommends planning for the effects of climate change including severe storms and flooding, to avoid costly damage to infrastructure, life, and health	Encourages the revision to the LWRP and Master Plan to support and incorporate sustainability, energy efficiency, resilience, and sea level rise Recommend development of a waterfront area master plan
Hudson River		
Revitalizing Hudson Riverfronts — Illustrated Conservation & Development Strategies for Creating Healthy, Prosperous Communities (2010)	Encourage Water-Dependent & Water-Enhanced Uses in or Adjacent to Municipal Centers Connect People to the River Protect, Restore, & Rehabilitate Fish & Wildlife Habitat Protect & Restore the Quality & Ecological Function of Water Resources	Recommends linking cultural and natural resources of the Town and Region to create a tourist destination Promotes the development of a Master Plan incorporating Water-Dependent & Water-Enhanced Uses that are connected to downtown Stony Point Promotes access to the waterfront for both tourists and residents Considers mussel/oyster bed restoration feasibility Promotes rehabilitation of wastewater conveyance to prevent overflow into Cedar Pond Brook and the Hudson River
DRAFT Hudson River Estuary Habitat Restoration Plan (July 2013)	Restore side channels, including tidal wetlands, vegetated shallow waters, back waters and intertidal habitats	Considers tidal wetland restoration north of Stony Point Bay Marina and South of Stony Point Battlefield Considers Oyster reef / mussels reef restoration feasibility

pertaining to the NYRCR planning process and to assist in the identification of potential projects and strategies that could be implemented to help Stony Point build back better. Regional goals from the plans that have been incorporated into the NYRCR Plan are listed along with a brief description of how the NYRCR Plan relates to or builds upon the regional plans. The findings are summarized in Table I-1.

The goal of this comprehensive document review was to avoid duplication of existing planning studies and projects, recognize gaps, and assess the potential synergies between local and regional needs and opportunities while considering how the NYRCR Plan might support and incorporate regional goals and perspectives.

Key shared local and regional challenges identified by the existing plan review included:

- Planning for the effects of climate change, including severe storms and flooding, to avoid costly damage to infrastructure, life, and health is a critical step toward long term resilience;
- County, State, and Federal agencies responsible for infrastructure maintenance, repair, and reconstruction have well considered long-term plans, but are restricted by the lack of available funding;
- Additional coordination and cooperation between municipalities and various local, state, and federal agencies is required to decrease vulnerability and

increase resilience;

- Conversion of underutilized waterfront land to open space and appropriate water-dependent uses designed for resilience and to accommodate sea level rise reduces risk, vulnerability, and cost of reconstruction in the event of natural disasters;
- Upgrade and repair of infrastructure to address areas of chronic flooding reduces roadway and culvert repair costs and limits road closures;
- Providing Hudson River waterfront access and additional funding for linking downtown areas with the Hudson River waterfront provides economic benefits in increased tourism spending.

Throughout the planning process, the Committee reviewed many ideas for regional projects, all of which supported goals set forth in the various previously completed regional plans. Additional information on these initiatives can be found in Section IV. "Implementation – Project Profiles."



2014 NY RISING COMMUNITY RECONSTRUCTION PLAN

NYRCR STONY POINT

Section II
Assessment of Risk and Needs





Assessment of Risks and Needs

A. Description of Community Assets and Assessment of Risk

i. Description of Community Assets

Purpose of Asset Inventory

Increasing resiliency in Stony Point begins with identifying various components of the community that can be better protected. Assets are features valued by the community that were impacted by Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy; are vulnerable to storm events; or are vital to the continued operation of the community before, during, and after storm events and therefore require additional attention in the future.

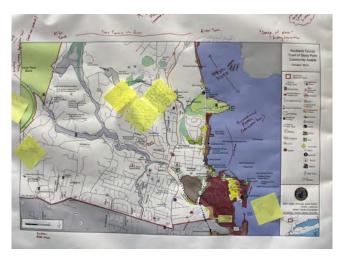
The Stony Point NYRCR Planning Committee identified assets include individual homes and residential neighborhoods, businesses, schools, infrastructure, emergency service and municipal buildings, natural habitats and parks, and other cultural resources that face future exposure. Many of these assets are highly valued by community members, who expressed particular interest in protecting them.

The purpose of the Asset Inventory is to identify and map these critical Community facilities and services so that better protective measures may be developed and implemented.

Definition of Community Assets and Systems

The Town of Stony Point identified assets that were impacted by Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy. These assets have either been impacted by these storms, are at great risk of being

impacted in the future, or provide essential recovery functions for residents and businesses in areas prone to flooding.



Review of Stony Point Community Asset Map, Public Engagement Meeting #1 (Jason Hellendrung)

Using existing GIS data, augmented by other State, County, and local databases and maps, the list of assets were assigned to one of the six following classes: (1) economic; (2) health & social services; (3) housing; (4) natural & cultural resources; (5) infrastructure; and (6) socially vulnerable populations.

Infrastructure Systems: roads, bridges, culverts, wastewater conveyance and treatment facilities, gas stations, stormwater, and shoreline protection systems.

Natural and Cultural Resources: the Cedar Pond Brook and other named and unnamed streams, the Hudson River, various ponds, Iona Island, wetlands and marshes, parks, recreation areas and open spaces, historic landmarks, and arts and entertainment venues.

Economic Assets: the central business district Route 9W/Liberty Drive where assets in the downtown core are grouped as a single-asset, supermarkets and other commercial uses, seasonal or tourist destinations, and marinas, restaurants and industrial facilities along and in close proximity to the Hudson River.

Heath and Social Services: pharmacies, hospitals, health and social service providers, government and administrative services, and critical emergency and utility services such as police, fire, ambulance (EMS), and public works facilities and providers.

Housing: residential neighborhoods (including single-family and multi-family dwellings and apartments where buildings in the same neighborhood may be grouped as a single asset), group homes, mobile home parks, and senior housing developments.

Socially Vulnerable Populations: assets that serve people with disabilities (i.e., Camp Venture), low-income populations, the elderly and young children, and people at risk of becoming or are currently homeless including shelters (i.e., Stony Point Center) and Rockland Food Pantry.

Throughout the public engagement process, the Committee augmented and refined the asset mapping and list to represent a comprehensive inventory of assets that are most critical to the town.

Methodology

The NY Rising Community Reconstruction Program developed a standardized methodology for NYRCR Communities to complete the asset inventory and undertake the risk assessment. The methodology included identifying, mapping, and categorizing assets and evaluating the risk to those assets posed by Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy.

The key components of the Asset Inventory and Risk Assessment process conducted for Stony Point are as follows:

- Collect preliminary mapping data;
- Identify and address potential data gaps with the state and town;
- Present and review mapping data;
- Create inventory of the Town's assets, with information on important attributes;
- Present and review asset inventory mapping;
- Refine asset inventory with the Committee; and
- Use the Risk Assessment Tool to evaluate risk to assets (for more information about the tool, see "Risk Assessment Tool" in Section II.A.ii., below).

Understanding Risk Areas

Understanding risk to assets with high community value is particularly critical to identifying measures of protection to mitigate impacts and increase asset and community resiliency in the event of future storms.

To accomplish this goal, the Committee worked to identify areas of extreme risk that have been repeatedly exposed to flood hazards. Any assets identified by the Committee as subject to repeat flooding and located within the 100-year floodplain were considered to be subject to extreme risk. Those that may have been affected by past flooding and/or are located within the 500-year floodplain were identified as being located in a High Risk Area. Additionally, there were a number of assets identified by the Committee as subject to repeat flooding that were not located in a mapped floodplain but were still included in the Extreme or High Risk Area in order to reflect community input and observations. Assets not located in a risk area or reported as repeat flood hazards were not considered for exposure evaluation, as assets located outside of risk areas automatically have risk scores of zero in the Risk Assessment Tool. Assets that are themselves surface water resources (i.e., streams, brooks, ponds, falls, and wetlands) were also not subject to the risk assessment process.



Attendees Review the Asset Inventory, Public Engagement Meeting #2 (Jason Hellendrung)

Public Engagement (Identifying Assets and Determining Community Value)

The Committee identified assets key to the functioning of their community that were impacted by Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy from the start of this process.

The asset inventory began with informal group discussions at the first Committee meeting focusing on key assets that were damaged by Superstorm Sandy, Hurricane Irene, and/or Tropical Storm Lee. Group discussion focused on better understanding the asset inventory and risk analysis process and how assets, including roads and waterways, emergency service facilities and communications, impact assets in Town and throughout the region. As the Town of Stony Point has assets that were impacted by Superstorm Sandy and/or the combined Lee and Irene storms, the Committee decided to divide their assets into two categories, coastal and riverine. With the assets divided into these two groups, the Risk Assessment Tool could be applied in a more tailored way to each of the two groups of assets to reflect the specific types of impacts that affected each group.

Following the preliminary discussion, the Committee reviewed and revised the asset mapping and

inventory lists at four additional Committee meetings. In between these meetings, a group of Committee members met to refine the asset inventory and refine the asset data analysis and mapping. The Committee organized a tour of the Town to further define their asset list, refine the asset mapping and provide context to the Planning Team.

Once the asset list was established, a separate survey of the assets was carried out to provide more details on these important Town resources. In addition to preparing an inventory of critical assets, the Committee assigned a community value to each asset expressed as high, medium, or low. The Committee decided that valuation (high, medium, low) of the assets would be left to each individual Committee member's interpretation.

Tables of riverine and coastal assets, including all of the information needed to conduct the risk assessments, were developed and presented to the Committee. The Committee provided input on the asset location, asset class, asset subcategory, socially vulnerable populations and—to a lesser extent—whether or not it is a critical facility as defined by FEMA as well as associated landscape attributes. The Committee was also instrumental in identifying assets that were outside of the mapped risk areas, which were then added to the asset inventory.

To gain understanding of the impacts of historic storms to a community's identified assets, the committee was asked to complete a questionnaire outlining the performance of each asset during recent storms. Furthermore, the committee was asked to provide information as to whether or not, to the best of their knowledge, the asset's critical features, including electrical and mechanical equipment, are located in a vulnerable area.

The asset inventory and mapping were presented at Public Engagement Meeting #1, held on October 16, 2013. Attendees were asked to review the inventory and mapping, comment on those assets already identified, provide input on additional assets for

consideration in the planning process, and value the assets. The key result of community input at Public Engagement Meeting #1 was that all assets that were mapped were high- and medium-priority. Any asset that was damaged in the storm or in danger of potential future damage should be the focus of the NYRCR planning process.



Chris Robbins Presents the NYRCR Program, Public Engagement Meeting #2 (Jason Hellendrung)

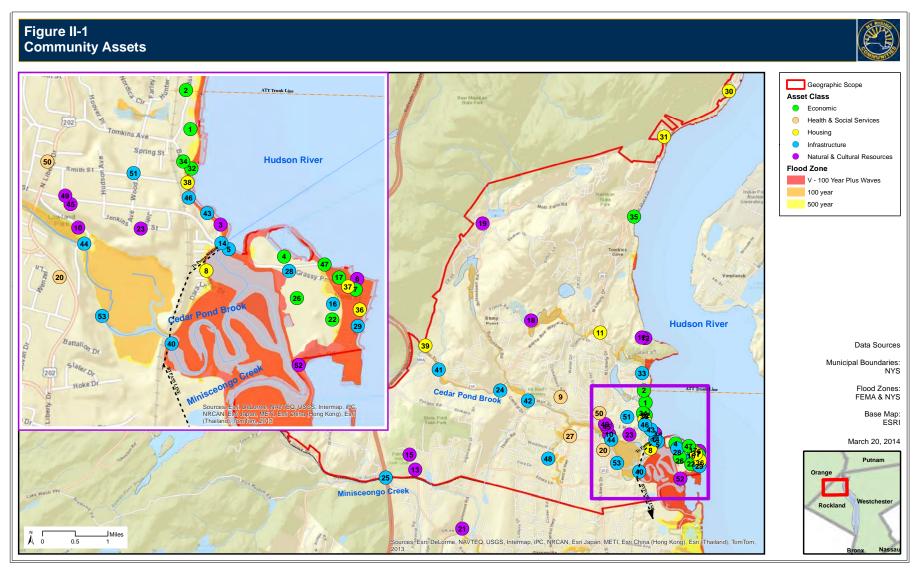
Additional assets identified at the Public Engagement Meeting were added to the inventory and the asset maps. These revised materials were presented to the Committee at subsequent meetings. As before, members endeavored, at and outside of meetings, to provide all needed details on each asset for inclusion in the final inventory and to assist with the assessment of risk. Other information needed to complete the vulnerability scoring was obtained from site visits, aerial imagery, and/or national and regional mapping data.

The final asset inventory and mapping is provided in Figure II-1.

Community Assets

- 1 Patsy's Bay Marina I and II
- 2 Stony Point Bay Marina
- 3 Vincent A. Clark Riverview Park & Kayak Access
- 4 Minisceongo Yacht Club/Marina
- 5 Access to Grassy Point Road Bridge (Penny Bridge)
- 6 River Front Park
- 7 Gilligan's on the Hudson
- 8 Ba Mar Mobile Home Park
- 9 Stony Point Center
- 10 Charles S. Eccher/Lowland Park
- 11 Four houses on Lighthouse Court
- 12 Kings Ferry Landing/State-owned houses
- 13 Letchworth Village
- 14 Beach Road Sewage Pump Station
- 15 Letchworth Village/RHO Emergency Services
- 16 Wastewater Treatment Plant
- 17 PANCO site
- 18 Boy Scout Camp Bullowa
- 19 Camp Addison Boyce Girl Scout
- 20 Stony Point Ambulance
- 21 North Rockland soccer fields
- 22 US Gypsum Manufacturing facility
- 23 Rockland Food Pantry
- 24 Central Dr (Rte 210)/Gate Hill Rd and Bridges
- 25 Willow Grove Road near entrance to PIP
- 26 US Gypsum Water Tower
- 27 Stony Point Police Department
- 28 Grassy Point Road
- 29 River Road
- 30 Jones Point
- 31 770 N. Liberty Drive RT & other RT9W houses
- 32 Seaweed Yacht Club
- 33 CSX
- 34 TZ Marine Services
- 35 WH Kassner
- 36 River Road (Housing)
- 37 Grassy Point Road (Housing)
- 38 Beach Road (Housing)
- 39 Cedar Flats Mobile Home Park
- 40 Kay Fries Sanitary By-Pass Pump Station
- 41 Cedar Flats Road
- 42 Reservoir Road and Bridge
- 43 Beach Road
- 44 Lowland Hill Road and Bridge
- 45 Town Hall
- 46 Beach Road Interceptor Sewer
- 47 Surfside 3 at Penny Bridge Marina
- 48 Laurel Drive Park
- 49 Library
- 50 Wayne Hose Fire Station
- 51 Stony Point Town Garage
- 52 Kayak access point Haverstraw
- 53 Cedar Pond Brook Interceptor Sewer

FIGURE II-1 Community Assets



ii. Assessment of Risk to Assets and Systems

The fundamental goal of the NYRCR program is to support the recovery and increase the resilience of the Stony Point community. To accomplish this, the community needs to better understand the risk to, and vulnerability of, its assets to the impact of storms. Often, communities do not even realize that certain areas, roads, buildings, or other vital facilities are at risk until it is too late and the damage is already done.

It is only when we all better understand the risk to our key community features that we are better able to protect them in the future. This assessment of risk attempts to accomplish that goal.

We take precautions to protect ourselves from routine storm events: cleaning out gutters, trimming tree branches, and making sure catch-basins are cleared of debris. We are accustomed to performing regular maintenance because we understand that nature is powerful, but generally predictable. Sometimes, during average-scale wind, rain, or snow storms, trees fall on roadways, taking with them power lines and parts of structures. People often view this as a by-product of creating a built environment within a natural environment. But the damage caused by Superstorm



The Aftermath of Superstorm Sandy (Thomas McGuire)

Sandy, Hurricane Irene, and Tropical Storm Lee far surpassed the levels of impact and damage that could be expected from one storm. The results were catastrophic, reminding everyone how vulnerable we are.

The Stony Point NYRCR Community went through a lengthy process of identifying not only the assets that were damaged in the storm events, but also the assets that were in danger of damage by future storms and those that are otherwise important to the community. This process was fundamentally assessing their risk. Throughout October and November 2013, the Committee reviewed base maps for Stony Point marking specific asset locations for risk assessment. Over the course of 10 meetings, the Committee reviewed the risk assessment process and provided input on the overall risk evaluation methodology, which is described in further detail below. The Committee participated in the development of hazard, exposure, and vulnerability scoring for each community asset. Further discussions dealt with grouping community assets located in close proximity to one another in order to increase the efficiency of the assessment, and understanding how asset grouping would affect overall risk to the asset. This process resulted in a list of Stony Point's assets, the risk scores, and a map of the assets with color coding for those risk scores.

Overview of Risk Assessment Methodology

The Risk Assessment process was performed using the Risk Assessment Tool provided by the New York State Department of State (NYS DOS). The risk assessment process involved using this tool to first identify "unmitigated" risk scores for assets or asset groups without proposed projects in place. Developing unmitigated risk scores required determining the exposure and vulnerability of assets through a process of mapping, gathering informational inputs from the Committee, and following consistent methodologies to determine landscape attributes and vulnerability scores for each asset. Figure II-2 provides an overview of the general risk assessment process, which is further described in the sections that follow.

Risk Assessment Tool

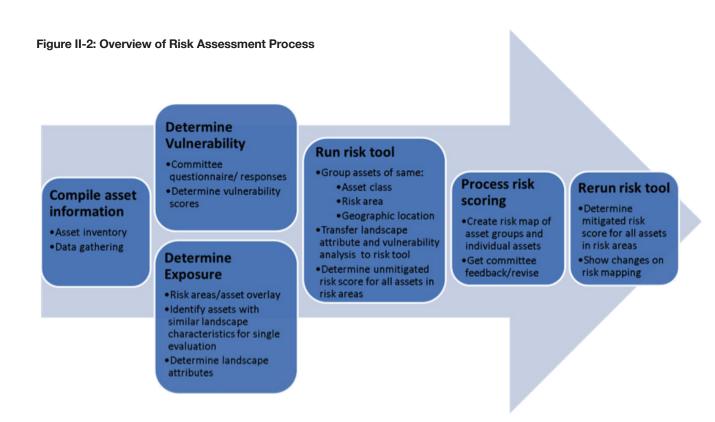
Using the asset inventory developed by the Committee and the community, the risk assessment process was performed using the Risk Assessment Tool. Unpopulated versions of the Risk Assessment Tool for coastal and riverine assets are presented in Figures II-3 and II-4. The tool, developed by the NYS DOS, synthesizes information from the asset inventory, hazard maps, and qualitative exposure assessments into hazard, exposure, and vulnerability scores. These are combined into one quantitative risk score. Other information, including the asset class, whether the asset serves socially vulnerable populations, whether the asset is a critical facility, or the asset's community value, can help inform a community about the benefits or priority of potential projects, but does not contribute to the asset's quantitative risk score.

Determining Hazard Score

The hazard score in the Risk Assessment Tool is based on the likelihood that a flooding event will occur and the magnitude, or destructive capacity, of the event. Likelihood is derived from the storm recurrence interval within the selected time frame. For the purposes of this evaluation, the hazard score corresponding to a 100-year storm event (the storm with a 1% chance of occurring in any given year) was used for all assets.

Determining Exposure Score

Exposure in the Risk Assessment Tool is based on both the risk area within which an asset or asset group is located and the local topographic and geographic conditions of its surroundings, or its landscape attributes. Once both the risk area and landscape attributes are determined, an exposure score is calculated.



Risk	Risk Assessment Tool															
	Asset Information				Landscape Attributes						Risk Assessment					
Asset	Risk Area	Asset Class	Vulnerable	Critical Facility	Community Value	Erosion	Beach Width	Shore Defenses	Protective Vegetation	Dunes and Bluffs	Soils	Landscape Attribute Score ("Yes" = +0.5)	Hazard Score	Exposure Score	Vulnerability Score	Risk Score

Figure II-3: Risk Assessment Tool - Coastal Assets

Risk	Risk Assessment Tool															
Asset Information				Landscape Attributes					Risk Assessment							
Asset	Risk Area	Asset Class	Socially Vulnerable Populations	Facility	Community Value	Protection Measures		Freeboard	Point of Confluence	Storm Water Discharge	Vegetated Stream Bank Buffers	Landscape Attribute Score ("Yes" = +0.5)	Score	Exposure Score	Vulnerability Score	Risk Score

Figure II-4: Risk Assessment Tool - Riverine Assets

Both risk area and landscape attribute determination are further described below.

Risk Area

Stony Point is subject to both coastal and riverine flooding hazards. Coastal areas are delineated as areas at risk of flooding from bodies of water subject to tidal influence, while riverine areas are those that are at risk of flooding from non-tidal rivers and streams. In general, coastal areas in Stony Point are those along the Hudson River shoreline. Given these dual flooding risks, multiple sources of information for flood risk identification were used. Maps of the 100- and 500-year Rockland County Flood Zones, obtained as part of the FEMA Q3 Flood Zone Data, were used to identify areas of high and moderate risk, respectively. An asset's risk area was then determined by overlaying assets with the flood risk areas. Areas of extreme risk were identified as those either within the coastal area subject to waves during storms, called the V-zone, or identified by the Committee to have been repeatedly affected by historic floods.

Assets not located in a risk area or reported as repeat flood hazards were not considered for exposure evaluation, as assets located outside of risk areas automatically have risk scores of zero in the Risk Assessment Tool.



Flooding along Beach Road, an Extreme Risk Area (Dominick Posillipo)

Landscape Attribute Determination

The two types of flood risk present in Stony Point, coastal and riverine, reflect the two types of land-scapes surrounding assets in the area. Each land-scape type has unique attributes considered in the risk assessment.

As shown in Figures II-3 and II-4, there are six unique landscape attributes considered separately for coastal and riverine assets when evaluating exposure. Cumulatively, the nature, condition, and presence or

absence of these attributes defines the degree of exposure of a geographic location.

Assets within risk areas of similar landscape characteristics were grouped to evaluate multiple assets at once. Assets whose landscape characteristics did not conform to those of others nearby were considered individually.

Data sources used for landscape attribute determinations include national and state mapping resources, aerial imagery, site visits, and input from local residents and authorities. For example, the most recent FEMA Flood Insurance Rate Maps (FIRMs), showing the water level elevations of the 100-year flood, were compared to elevation data for each asset location. This comparison was used to evaluate whether the asset is below the likely flood level, which increases risk. The National Hydrography Dataset was used to investigate whether a point of confluence of two streams was present in the immediate vicinity of the asset location, thus also increasing flood risk.

A completed example of a landscape attribute determination worksheet is provided in Section V.D, Figure V-1.

By completing the landscape attribute determination worksheets for each asset or asset area, all of the answers needed to create a landscape attribute score in the Risk Assessment Tool were determined. With the combination of the landscape attribute score and the particular risk area of the asset determined, the exposure score for the asset or asset area was calculated in the Risk Assessment Tool.

Determining Vulnerability Score

The vulnerability of an asset is defined as an expression of the capacity of an asset to return to service after a storm, taking into account its material strength relative to the flood hazard as well its regenerative capacity. To effectively evaluate this metric, several asset characteristics were considered, including the impacts to the asset during historic storm events, the construction materials of the asset, the physical



Coastal landscape areas are susceptible to storm surge and wave action, such as these marinas along Beach Road. (Chris Robbins)



Riverine landscape areas are at risk of flooding from creeks and streams overtopping their banks. Here, the Cedar Pond Brook at Liberty Drive. (Alice Brown)

condition of the asset, the presence of any critical features such as utilities or important equipment in flood-prone locations, occupation by vulnerable populations, and the elevation of the asset relative to the FEMA-tabulated flood elevation. All of these factors contribute, to varying degrees, to an asset's ability to withstand and recover from storm events.

The qualitative characteristics listed above were entered into a matrix in order to obtain a quantitative vulnerability score that could be used in the Risk Assessment Tool. The vulnerability score is a numeric value from 1 through 5, with 5 representing the most

vulnerable condition, and 1 representing the least vulnerable. A completed example of a vulnerability score determination worksheet is provided in Section V.D., Figure V-2.

The vulnerability scoring process and the resultant scores were presented to and reviewed by the Committee to ensure acceptance and understanding of both methodology and results.

Risk Scoring

Once all of the required information was entered into the risk tool, risk scores were calculated within the tool for each asset by multiplying the hazard score, exposure score, and vulnerability score (i.e., Hazard x Exposure x Vulnerability = Risk). The risk scores provide a quantitative comparison of the risk to different assets within a community. Risk scores range from 0 to 75, with the following ranges signifying the following degrees of risk:

<6: Residual risk;</p>

▶ 6-23: Moderate risk;

▶ 24-53: High risk; and

>53: Severe risk.

Asset groups and individual assets were then drawn on risk area maps to visually depict asset risk as well as identify the areas of a community with the highest concentration of assets at risk. These maps, in conjunction with the completed Risk Assessment Tool, were then presented to the Committee for the purpose of assessing completeness and alignment with expectations.

Unmitigated Risk Scoring Results

Following the process discussed above, the risk scores of the identified assets without any projects in place, deemed "unmitigated" risk scores, were compiled for the assets and systems identified by the Committee. The resulting risk assessment scoring spreadsheets are presented in Section V.D. The unmitigated risk scores are presented graphically in Figures II-5 and II-6 providing a visual representation of the four risk categories: residual, moderate, high and severe.

From the unmitigated risk scoring maps (Figures II-5 and II-6), it is clear that the areas of Stony Point along the Hudson River, in particular the approximately onemile stretch of shoreline from Stony Point Battlefield State Historic Site to Grassy Point Road and the entirety of Grassy Point, represent the highest concentration of high and severe risk scores. This is consistent with expectations, given the low topography of the areas along the river and the reportedly severe impacts to these areas during historic storm events.

In particular, housing assets in low-lying areas along the Hudson River, listed on the risk score map as Beach Road Housing and Coastal Housing - South, were identified as subject to severe risk. The severe risk scores are driven largely by the significant impacts to these assets during historic storms reported by the Committee. In addition to effects of historic storms, the geographic features between these assets and the flood source do not offer means of protection to the assets, resulting in a high exposure score. The economic assets in these areas along Beach Road and on Grassy Point are identified as being at severe risk as well, similarly driven by their exposed geographic location and critical impacts of historic storms.

The groups of assets of similar type and risk category reflect the risk to critical systems within the community. In particular, the network of coastal roads and bridges, the coastal wastewater infrastructure system, and the CSX train track system were identified as subject to high risk. All of these systems are in areas of low elevation and in close proximity to flood sources.

The Wastewater Treatment Plant, located on Grassy Point, is in a highly exposed location, without any geographic features in place to buffer it from the effects of a storm. Accordingly, the plant was subject to flooding during Superstorm Sandy. However, the duration of the effects of the flood on the plant was limited, which resulted in a low vulnerability score for the asset. Similar risk scoring results can be observed

for the variety of natural and cultural resources located along the Hudson River shoreline, including Vincent A. Clark Riverview Park & Kayak Access, Riverfront Park, and the kayak access point in Haverstraw, ultimately leading to placement in the high risk category rather than the severe risk category.

There are also twelve assets at moderate or high risk in inland areas due to riverine flooding hazards, five of which are sections of road crossing streams, creeks, and other flood sources. Charles S. Eccher Lowland Park and Lowland Hill Road are, as their names suggest, at a low elevation relative to the Base Flood Elevation (BFE), and thus have high exposure scores. Accordingly, they are in the high risk score category. The Cedar Pond Brook Interceptor Sewer, which runs along the shoreline of Cedar Pond Brook, is also in a highly exposed location. Though it did not experience interruptions in service during historic storms, it is reported as currently in precarious condition as a result of those storms, and thus has the highest risk score of all the identified riverine assets. Some of the identified inland assets are not

necessarily in highly exposed locations, but were affected, either directly or indirectly, by historic storm events. For example, the Stony Point Center has a low exposure score, and the asset itself was not adversely affected by historic storms, but access to the facility was inhibited for a period of time after Superstorm Sandy, resulting in a moderate risk score.

Though the risk scores of Stony Point assets vary widely, some overall trends can be interpreted from these results. In general, assets along the Hudson River shoreline are highly exposed to flood hazards, resulting in high and severe risk scores. Housing and economic assets and infrastructure systems along Beach Road and on Grassy Point are all at significant risk. Risk to all of these assets will likely only be exacerbated by sea level rise anticipated to occur over the next century. Additionally, assets located inland from the Hudson River are subject to moderate and high risks due to riverine flooding, though the risk scores of these assets are generally lower than those located along the Hudson River.

FIGURE II-5 Risk Area Map - Extents

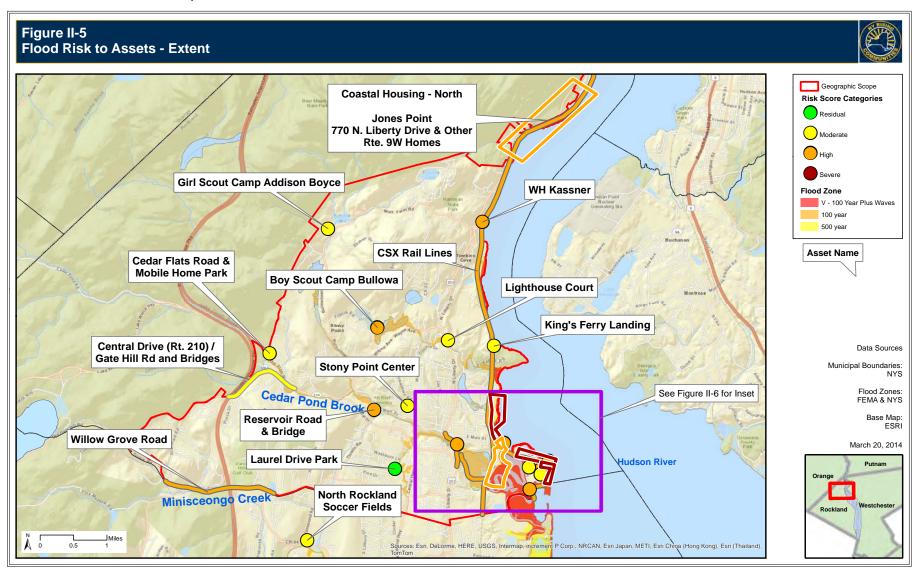


FIGURE II-6 Risk Area Map - Inset

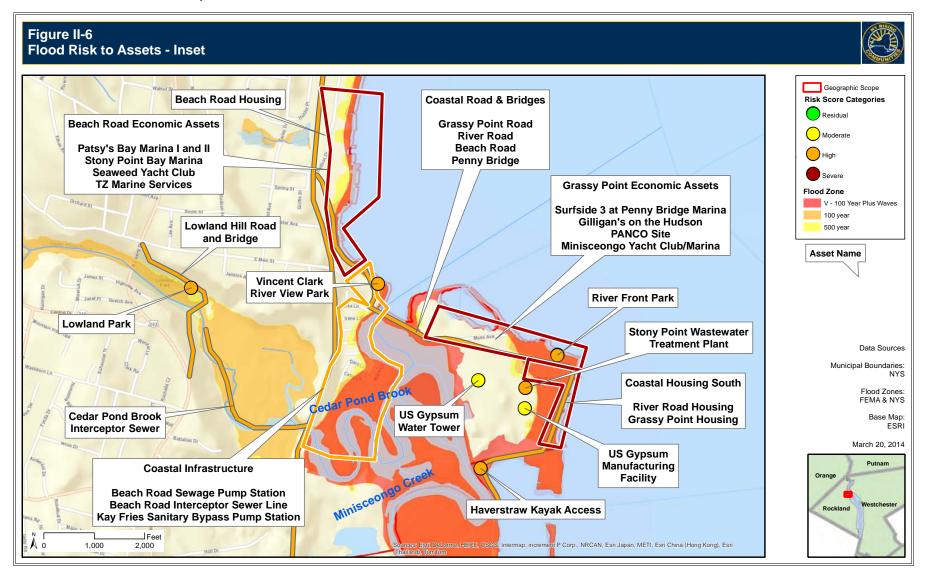


Table II-1 Flood Risk to Assets Located in Risk Areas

Map Asset #	Asset Name	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Flood Risk Area	Risk Score
1	Patsy's Bay Marina I and II	Economic	Marina/Water Based Business	Yes	No	High	Extreme	Severe
2	Stony Point Bay Marina	Economic	Marina/Water Based Business	Yes	No	High	Extreme	Severe
3	Vincent A. Clark Riverview Park & Kayak Access	Natural and Cultural Resources	Parks and Recreation	Yes	No	High	Extreme	High
4	Minisceongo Yacht Club/Marina	Economic	Small Business	Yes	No	High	Extreme	Severe
5	Access to Grassy Point Road Bridge (Penny Bridge)	Infrastructure Systems	Transportation	Yes	No, Locally Significant	High	Extreme	High
6	River Front Park	Natural and Cultural Resources	Parks and Recreation	Yes	No	High	Extreme	High
7	Gilligan's on the Hudson	Economic	Restaurants	Yes	No	High	Extreme	Severe
8	Ba Mar Mobile Home Park	Housing	Single-Family Residence	Yes	No	High	Extreme	Severe
9	Stony Point Center	Health and Social Services	Emergency Operations/ Response	Yes	Yes, FEMA	High	High	Moderate
10	Charles S. Eccher/ Lowland Park	Natural and Cultural Resources	Parks and Recreation	Yes	No	High	Extreme	High
11	Four houses on Lighthouse Court	Housing	Single-Family Residence	Yes	No	Medium	Moderate	Moderate
12	King's Ferry Landing	Natural and Cultural Resources	Historic Landmarks and Facilities	No	No	High	Extreme	Moderate
14	Beach Road Sewage Pump Station	Infrastructure Systems	Wastewater	No	Yes, FEMA	High	Extreme	High
16	Wastewater Treatment Plant	Infrastructure Systems	Wastewater	Yes	Yes, FEMA	High	Extreme	High
17	PANCO Site	Economic	Small Business	Yes	No	High	Extreme	Severe
18	Boy Scout Camp Bullowa	Natural and Cultural Resources	Parks and Recreation	Yes	No	High	Extreme	High
19	Camp Addison Boyce - Girl Scout	Natural and Cultural Resources	Natural Habitats	Yes	No	High	Extreme	Moderate
21	North Rockland soccer fields	Natural and Cultural Resources	Parks and Recreation	No	No	Medium	Extreme	Moderate
22	US Gypsum Manufacturing facility	Economic	Large Business	Yes	No	High	Extreme	Moderate
24	Central Dr (Rte 210)/ Gate Hill Rd and Bridges	Infrastructure Systems	Transportation	No	No	High	High	Moderate

Table II-1 Flood Risk to Assets Located in Risk Areas (Cont'd)

Map Asset #	Asset Name	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Flood Risk Area	Risk Score
25	Willow Grove Road near entrance to PIP	Infrastructure Systems	Transportation	No	No	High	Extreme	High
26	US Gypsum Water Tower	Infrastructure Systems	Large Business	No	No	Medium	High	Moderate
28	Grassy Point Road	Infrastructure Systems	Transportation	Yes	No, Locally Significant	High	Extreme	High
29	River Road	Infrastructure Systems	Transportation	Yes	No, Locally Significant	High	Extreme	High
30	Jones Point	Housing	Multi-Family Residence	Yes	No	High	Extreme	High
31	770 N. Liberty Drive RT & other RT9W houses	Housing	Single-Family Residence	Yes	No	High	Extreme	High
32	Seaweed Yacht Club	Economic	Small Business	Yes	No	High	Extreme	Severe
33	CSX	Infrastructure Systems	Transportation	Yes	No	High	Extreme	High
34	TZ Marine Services	Economic	Small Business	No	No	Medium	Extreme	Severe
35	WH Kassner	Economic	Small Business	No	No	Medium	Extreme	High
36	River Road (Housing)	Housing	Single-Family Residence	Yes	No	High	Extreme	Severe
37	Grassy Point Road (Housing)	Housing	Single-Family Residence	Yes	No	High	Extreme	Severe
38	Beach Road (Housing)	Housing	Single-Family Residence	Yes	No	High	Extreme	Severe
39	Cedar Flats Mobile Home Park	Housing	Affordable Housing	Yes	No	High	Extreme	Moderate
40	Kay Fries Sanitary By-Pass Pump Station	Infrastructure Systems	Wastewater	No	Yes, FEMA	High	Extreme	High
41	Cedar Flats Road	Infrastructure Systems	Transportation	Yes	No	High	Extreme	Moderate
42	Reservoir Road and Bridge	Infrastructure Systems	Transportation	Yes	No	High	Extreme	High
43	Beach Road	Infrastructure Systems	Transportation	Yes	No, Locally Significant	High	Extreme	High
44	Lowland Hill Road and Bridge	Infrastructure Systems	Transportation	No	No	Medium	Extreme	High
46	Beach Road Interceptor Sewer	Infrastructure Systems	Wastewater	No	Yes, FEMA	High	Extreme	High
47	Surfside 3 at Penny Bridge Marina	Economic	Marina/Water Based Business	Yes	No	High	Extreme	Severe
48	Laurel Drive Park	Natural and Cultural Resources	Parks and Recreation	No	No	Medium	Moderate	Residual
52	Kayak access point - Haverstraw	Natural and Cultural Resources	Parks and Recreation	No	No	Low	Extreme	High
53	Cedar Pond Brook Interceptor Sewer	Infrastructure Systems	Wastewater	No	Yes, FEMA	High	Extreme	High

B. Assessment of Needs and **Opportunities**

The assessment of needs and opportunities was undertaken to identify which issues need to be addressed in Stony Point in the aftermath of Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy, and identify the opportunities that are available to address these needs. Stony Point suffered significant impacts during these storm events, forcing the Town to reexamine its current emergency preparedness, response, and recovery systems. Systems that had once appeared resilient now seemed exposed in the face of unparalleled natural disasters. Firsthand experience of these events helped highlight the inadequacies of the existing systems of flood mitigation in the Town, revealing vulnerabilities but providing opportunities to identify and strengthen the key systems that support a community's recovery. NYRCR funding will enable Stony Point to address these vulnerabilities while taking full advantage of the identified opportunities.

After the asset inventory and mapping were completed, the Committee was able to understand community assets as being part of systems that protect the community. The Committee evaluated where gaps existed in current protective measures and identified the elements that needed to be addressed to make the community safer, all the while pinpointing opportunities to maximize the use of existing resources. Identifying vulnerable and exposed systems enabled the Committee to extract specific short- and longterm needs. Focusing on these challenges and how they may be addressed helped reveal the numerous opportunities that exist to develop more resilient community networks in Stony Point. Needs and opportunities can relate to direct damage caused by the storms, lost opportunities resulting from the storms, efforts to make existing assets more resilient, or issues that predated the storms entirely.

The Committee's analysis of needs and opportunities was enhanced by input from the public at two Public Engagement Meetings, where members of the Stony Point community were able to weigh in on draft lists that the Committee had compiled. This process was critical to developing a better understanding of the broad array of needs the community faces as a result of significant storms, and the opportunities present in the Town. Once completed, the list of needs and opportunities was instrumental in developing the many projects the Committee has put forward in this Plan.



Community Planning and **Capacity Building**

Community Planning and Capacity Building incorporates Stony Point's ability to implement storm recovery programs and activities and to plan for resiliency and recovery for future events. It encompasses laws, regulations, and planning activities, as well as civic engagement and public education. In the wake of Hurricane Irene and Superstorm Sandy, prior work on Community Planning and Capacity Building activities in Stony Point proved its worth - homes that had been raised stood firm, evacuations along the Hudson River moved people out of harm's way, and shelter facilities were put to good use. However, a great deal of work remains to be done as is evidenced by the damage Stony Point incurred.

Education and Access to Information

The community has identified a need for improved awareness of emergency preparedness, response, and recovery procedures and best practices, which is partly based on a lack of access to the information that exists. The recent storms shed light on the difficulty of accessing this information. Evacuation routes are unmarked and residents have expressed uncertainty regarding access routes out of the flood zone during storm events. Emergency evacuation outreach in advance of the storms would have benefited from a more thorough understanding on the part of residents of their options and responsibilities in advance of a disaster. Emergency communications were lacking during and after the storm despite the existence of a town radio station that could have been used to communicate with residents. Since the storm, home and business owners have been frustrated by problems The six key NYRCR Recovery Support Functions (RSFs) were established by President Barack Obama in 2011 through the National Disaster Recovery Framework. The RSFs were designed to "support local governments by facilitating problem solving, improving access to resources, and fostering coordination among State and Federal agencies, nongovernmental partners and stakeholders" (http://www.fema.gov/recovery-support-functions). The following sections summarize these RSFs and their relevance to Stony Point.

Community Planning and Capacity Building

Planning activities will enable Stony Point to implement storm recovery activities and mitigate the effects of future storms. Building and zoning regulations and land use plans form the basis for responding to the damage that may result from future storm events. Public outreach and education make information available to the public and are critical to implementing plans.

Economic Development

Stony Point's business activities were interrupted during and after the recent storms. Providing businesses with the means to quickly reopen after natural disasters is critical to ensuring the Town's economic future, as is diversifying the Town's economy through enhanced waterfront businesses, tourism, and industry.

Housing

Housing located in risk areas across the Town, and especially along the Hudson River, has been damaged by flooding, storm surge, and wave action. This housing remains vulnerable without new resilience practices including elevation and floodproofing. Additionally, assessing alternate housing locations for the most vulnerable populations outside of risk areas is an important goal for the Town.

Health and Social Services

During Superstorm Sandy, the initial evacuation center at the police station was overcrowded within hours. Without the Stony Point Center, families would have had to find temporary housing elsewhere, likely outside of the Town. Providing adequate shelters and ensuring that residents are aware of these facilities are critical to the Town's resilience.

Infrastructure Systems

Stony Point experienced damage to critical infrastructure during Hurricane Irene and Superstorm Sandy, including flooding and undermining of sewer lines and facilities, and flooding and damage to roads and transportation routes throughout the Town. Protecting this infrastructure is essential, especially along the Hudson River where damages have been most severe.

Natural and Cultural Resources

Capitalizing on the resiliency potential of the Town's natural resources is a primary goal for Stony Point. Restoring stream channels, tidal wetlands, and other natural infrastructure would protect the waterfront and upland areas against further damage, while providing habitat and making the Town a more beautiful place to live and visit.

obtaining information on recovery programs, available funding, and other recovery resources. This lack of access to information has been especially difficult for socially disadvantaged groups, including the residents of Ba Mar mobile home park, who experienced severe losses during Superstorm Sandy. Emergency evacuation and response information and procedures are not widely understood, and some of these documents are only provided in English, despite the presence of a non-English-speaking community in town. Hazard mitigation planning documents may be in need of updates.

The community has identified several opportunities for improvements in this area. Fuller use of the existing radio station can serve as a basis for enhancing communication before, during and after storm events; such communication could be further expanded using the Town website and email listserv/mailing list. Additional evacuation and response materials could be developed in collaboration with existing organizations in the town, such as the local Chamber of Commerce. Another existing resource is Stony Point's Local Waterfront Revitalization Program (LWRP), a planning document for the waterfront area that could be used as the basis of storm-related enhancements to the waterfront. An opportunity exists to involve the non-English-speaking community in developing informational and educational materials in Spanish, among other languages, and disseminating that information to those who need it. The existing evacuation plan for Indian Point could be used as a starting point for developing evacuation routes and procedures for severe weather events.



Economic Development

Economic Development in the wake of disaster is concerned with returning economic activity back to good health as quickly as possible, as well as enhancing the local economy by creating new economic opportunities. In Stony Point, Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy were major setbacks for the Town's economy, particularly along the

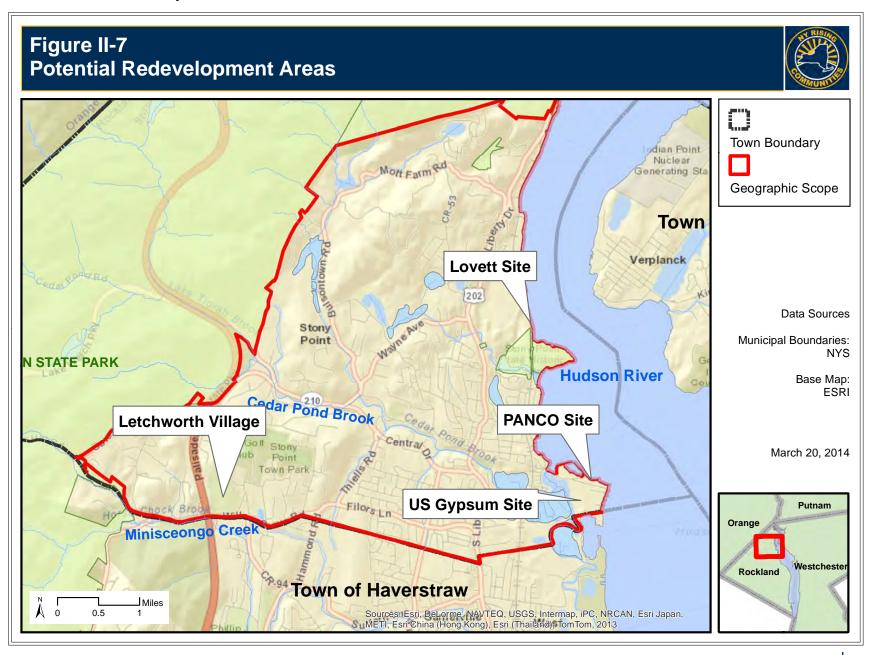
waterfront, where businesses sustained damage and some have yet to reopen.

Stronger Economic Base

Past storm events, and in particular Hurricane Irene, Tropical Storm Lee and Superstorm Sandy, have caused severe damage to economic assets in the town and have disrupted commerce and tourism. The community has identified rebuilding the Town's economic base as an important need. There are two centers for the town's economy: the downtown area and the waterfront. The Committee expressed that the downtown is stagnant and could be improved through developing a more attractive, vibrant "town center." This can be achieved in part through better pedestrian facilities and public transportation options, which would bring more people to the downtown and give the area a walkable, downtown feel. The waterfront has also been identified as needing further investment to increase tourism. While the town has several tourist attractions including the Stony Point Battlefield and Bear Mountain and Harriman State Parks, the Appalachian Trail, and the planned Washington Rochambeau Revolutionary Route National Historic Trail, these facilities are distant from the town center and waterfront and tourists generally do not stay in town after visiting these attractions. A better-developed town center and waterfront could capture more of this tourism potential. The community has also expressed that improved communication between the town and the business community could facilitate improved economic conditions.

Several opportunities have been identified for revitalizing Stony Point's economy. Stony Point's LWRP contains recommendations for improving the economy of the Town's waterfront. Another plan exists for redevelopment of the Liberty Drive corridor into more of a "Town Center"; development could be encouraged to take place in line with these planning documents. A number of underutilized sites exist in the Town and that may present the opportunity for redevelopment, including the U.S. Gypsum plant, former Lovett site, PANCO Petroleum facility, and Letchworth Village. The waterfront, including the marina district, is

FIGURE II-7 Community Assets



particularly well-suited for economic redevelopment as a tourist destination. In fact, many tourists already pass through the Town, but an effective tourist infrastructure is not in place to take advantage of their presence. This is due in part to the fact that many tourists spend their time in the State Parks and other areas that are distant from the economic center of Stony Point. An opportunity exists to capitalize on this opportunity by creating a network connecting the various tourist attractions and events in and around the Town to give tourists an incentive to stay longer in Stony Point. Additional public transportation and pedestrian options, including the expansion on the sidewalk network, bus/trolley service between Route 9W, the battlefield and the waterfront, ferry service and passenger rail on the existing freight rail lines, would reinforce such a network. These improvements would also tie together all of the existing tourist attractions in Town and bring more visitors to Stony Point. These new connections would support a future expansion of tourist facilities in the heart of Town. An additional opportunity exists to create business incentives, support a business alliance, and build the Town's brand.

There is an opportunity to build on the 2-day workshop on planning for economic and fiscal health hosted by the Town of Stony Point in June of 2012. The workshop gave community members a better



Route 9W/Liberty Drive is Stony Point's main commercial district (Jason Hellendrung)

understanding of the benefits of "smart growth" and its implementation strategies, and encouraged them to participate in an open discussion on the Town's past, present and future. The workshop was funded by the U.S. Environmental Protection Agency's (USEPA) Building Blocks for Sustainable Communities program through a nationwide competition. Stony Point was one of 56 communities selected for the technical assistance program titled, "Using Smart Growth to Produce Fiscal and Economic Health." The program resulted in a "Next Steps" summary that provided the community with a blueprint for expanding economic opportunities and improving the quality of life overall, including resiliency strategies such as environmentally-sensitive planning in commercial areas that coincide with flood zones along the Hudson River, greenways and recreational trails as flood buffers, and wetland restoration to protect economic assets. Sections of the summary, EPA Technical Assistance for Sustainable Communities: Stony Point (2012), were incorporated into the most recent update of the Town's Comprehensive Master Plan, approved in 2013.

Affordable Flood Insurance

Due to the devastation caused by Superstorm Sandy, flood insurance rates have increased significantly in Stony Point. Residents have expressed the need to access more affordable flood insurance. The community is concerned that if not addressed, this issue would limit affordability of housing in the town, thereby making it less attractive to new and existing residents. An opportunity exists to initiate the Town's participation in the Federal Emergency Management Agency (FEMA) National Flood Insurance Program's (NFIP) Community Rating System (CRS) a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements to lower residents' flood insurance rates.



Housing

Housing needs include ensuring adequate housing for all residents, providing a range of housing types to fulfill the needs of a diverse population, and protecting housing that is most at risk. Stony Point's housing stock was heavily affected by the recent storms. A large amount of housing along the Hudson River waterfront was severely damaged, some of it rendered uninhabitable. The Ba Mar mobile home park, a community that provides affordable housing, was devastated by flooding during Superstorm Sandy; approximately 70 homes were over 50% damaged. Many Ba Mar residents are still searching for the resources to rebuild, while others have left for good. Cedar Flats Mobile home park, which also offers reasonably priced housing options, sustained damage from flooding. Residents of the waterfront still struggle with housing issues, and some have moved out of Town entirely as a result of the damage to their homes. Additionally, many Stony Point residents, including a large number of the residents in Ba Mar, do not speak English as their native language and face added difficulty in resolving post-Sandy housing issues because of a language barrier.

When housing was discussed by the Committee, they determined that a comprehensive review of the overall availability of housing was not a pressing need that should be addressed as part of this program. Rather, the Committee was more interested in addressing the damaged Hudson River waterfront housing, outreach to those whose homes were lost or damaged and how to limit impacts from future storms. Specifically, needs that included the identification of vulnerable housing for elevation, clean-up/demolition of abandoned and/ or foreclosed properties, assurance that new and redeveloped housing stock is code-compliant / more resilient, and provision of emergency housing and preservation of mixed housing stock were the focus of the housing needs discussion. These are expanded on below.

Understanding that the goal of the needs assessment for the NYRCR program requires communities to take a hard look at their most pressing needs and identify projects that meet those needs, the Committee asserted that their housing need required: identifying and allocating funding for rehabilitation and repair to homes damaged during the storms; revisions of local zoning regulations to restrict development from floodplains and flood prone areas; and better education and financing for elevating and flood proofing homes that were vulnerable to future flooding.

More Resilient Housing Stock

The Committee identified a need to address vulnerable housing in the Town, particularly in areas along the Hudson River. As discussed above, housing was damaged or destroyed by Hurricane Irene and Superstorm Sandy. Restrictions on residential development and/or redevelopment as well as compliance with and enforcement of the existing building code in identified risk areas is needed, including for older housing units that are not legally required to meet the code. There is also a need to deal with abandoned, foreclosed, and damaged properties which have not been kept up since the storms. These properties are a safety hazard and an economic blight on the surrounding areas. The roof on one of these houses recently collapsed. There is also a need to revisit the Town's zoning code to



A garage along River Road is buffeted by waves during Superstorm Sandy (Dominick Posillipo)

ensure that resilient rebuilding can take place in the waterfront and other flood-prone areas. It is important to note that the Town recently adopted the FEMA advisory base flood elevations established after the recent storms into its local Flood Damage Prevention Law (Chapter 112 of the Town Code).

A number of opportunities exist to improve resiliency of Stony Point's housing. The large number of vacant and abandoned properties in flooded areas, as well as other redevelopment sites along the waterfront, such as the Corts Marina site, provides an opportunity for redevelopment with the latest resiliency technologies. Open areas in other parts of Town that are far outside the flood zones, such as Letchworth Village, provide another opportunity for new housing that will not be vulnerable to flooding. Housing built in compliance with the Flood Damage Prevention Law suffered far less damage than older, pre-code units, and an opportunity exists to reduce future storm damages by strengthening compliance with the existing code.

More Inclusive Housing Stock

A need exists to ensure the continued diversity of the Town's population by preserving the mixed income and multi-generational options that currently define Stony Point. Low-income residents experienced severe housing damages during Superstorm Sandy. particularly in the Ba Mar mobile home park, and many of these residents did not return to the Town after the storm.

Providing resources for tenants of multi-family homes, both in terms of sheltering displaced residents after a disaster, and returning them to safe and resilient housing, is another essential part of ensuring this diversity. Additionally, security in times of upheaval such as storm and other disaster events is essential to ensure the safety of these vulnerable populations as well as their homes and possessions. An opportunity exists to work with residents of Ba Mar and other lower-income or multi-generational housing areas to address their needs and ensure their continuity in Stony Point.



Health and Social Services

Identifying Health and Social Services needs are among the most essential concerns following a catastrophic storm. Ensuring that public health, health care facilities and essential social services needs are restored straightaway is critical to community recovery. These services include healthcare facilities and emergency services as well as schools, eldercare facilities, childcare, and similar services. Stony Point was fortunate in that these services, located for the most part away from areas of flooding, were not heavily impacted by Hurricane Irene and Superstorm Sandy. Police and emergency services played their part in ensuring that the immediate recovery after these storms was as rapid and as safe as possible.

Emergency Response Centers/Shelters

A need exists to enhance the existing emergency response and evacuation centers in the Town. During Superstorm Sandy, the emergency evacuation center at the Police Station was overwhelmed due to the large number of displaced residents. In the months after the storm, displaced residents sheltered at the Stony Point Center, which served the community well but has limitations including flooding, a lack of emergency power supply, and a location disconnected from basic services such as supermarkets and medical facilities. Those who lost or do not own a vehicle experienced difficulty because of the lack of pedestrian access and public transportation options. The emergency operations center, also at the Police Station in the same room as the storm response center, served well but is in need of capacity improvements including a Central Communications Center to coordinate emergency response efforts.

Opportunities exist to improve existing facilities and create new ones to fulfill these needs. The Stony Point Center has successfully served as a long-term shelter and should continue to do so with certain improvements. The community also identified several locations at which existing facilities could be improved to accommodate a resiliency center, storm shelter or emergency operations/control center. These include the RHO Building at Letchworth Village, the Stony Point Ambulance Station, the Immaculate Conception Church and School, the Stony Point Elementary School, and Farley Middle School. To facilitate the use of these facilities in a resiliency function, transportation enhancements would be needed throughout the Town including public transportation routes serving these locations. Publicly owned vehicles such as school buses could be used to assist with evacuation. Coordination of evacuation activities by first responders and emergency personnel would be enhanced by the establishment of an emergency operations command center.



Infrastructure Systems

Infrastructure repairs and enhancements are often one of the largest investments a community will make after a disaster. Rebuilding infrastructure in a way that is more resilient is a key to ensuring community-wide resiliency to future storms. In Stony Point, several major infrastructure components were affected by Hurricane Irene and Superstorm Sandy, including the wastewater treatment plant, which was partially flooded, and the Cedar Pond Brook interceptor sewer



The seawall along the Hudson River is in need of repair (Chris Robbins)

line, which was heavily undermined by floodwaters. Roadways, bulkheads and other infrastructure along the waterfront were damaged during the storms and are also in need of repair.

The community identified infrastructure that was damaged during the storms, components and facilities that have been patched up until permanent repair and replacement can occur, facilities that have been replaced, and those that remain untouched since the storm events still requiring significant attention.

The NYRCR program looks at measures to rebuild community infrastructure with increased resiliency. That is, specifically, to build back better. This is critical for improving the ability for the community to better withstand impact from future storms.

Strong Shoreline Defenses

Hurricane Irene and Superstorm Sandy revealed a need for stronger defenses along the Hudson River shoreline. The waterfront was the most heavily damaged area of Stony Point during these storms, with homes, marinas, and other assets suffering heavy damages. A number of opportunities exist to improve shoreline defenses. One opportunity is to strengthen existing defensive infrastructure, including jetties, bulkheads, and seawalls. Another opportunity exists to use newer technologies including floating breakwaters, and natural infrastructure such as oyster and mussel shoals, seagrass beds, or tidal wetlands.

Resilient Sewage Network

A need for resiliency improvements to the Town's sewage infrastructure has been identified by the Committee. The Stony Point wastewater conveyance and treatment network suffered severe damage during Hurricane Irene and Superstorm Sandy, and remains highly vulnerable to damage in future storms. The North Street sewage plant on Grassy Point was partially flooded during Superstorm Sandy; the Cedar Pond Brook interceptor sewer line is in danger of catastrophic failure due to an undermined support

structure; and Hudson River water infiltrated the Beach Road interceptor sewer. Opportunities exist to strengthen this infrastructure, bring it to a state of good repair, and harden it against future flooding through waterproofing, raising critical components above flood elevation, armoring facilities to prevent water intrusion as well other measures.

Resilient Roads and Bridges

The Committee identified a need for resiliency improvements to Stony Point's road and bridge network. Hurricane Irene and Superstorm Sandy caused flooding and damage to a number of roadways and bridges in Stony Point. Along the waterfront, a number of roadways were flooded and vehicular access was blocked for all, including emergency vehicles across the Grassy Point Bridge, forcing evacuations from Grassy Point to take place by boat. Particular needs exist for improved drainage on Beach Road, Grassy Point Road, and River Road. Roadways along Cedar Pond Brook and other creeks experienced washouts, and access ramps to the Palisades Interstate Parkway were blocked by creek flooding. Similarly, narrow bridge culverts over streams caused flooding when water flow surpassed the culverts' capacity. There is an opportunity to improve the resiliency of the roadway and bridge network in Stony Point by using flood modeling to reconfigure roadways and bridge culverts in a way that gives sufficient space to waterways.



Roadway flooding during storm events has blocked access to emergency vehicles (Dominick Posillipo)

Resilient Fuel System

Superstorm Sandy revealed the need to increase the resiliency of Stony Point's fuel system, which failed when power went out during the storm and gas station pumps could not operate. As a largely suburban and rural community, Stony Point residents require uninterrupted access to fuel during and after disaster events. An opportunity exists to retrofit strategic fuel stations with generators that will ensure continued service during power outages. Additionally, a need exists to secure the PANCO Petroleum tanks on Grassy Point, which were nearly carried away during Superstorm Sandy. As the PANCO tanks are located on private property, the Committee did not create a project to address this need directly. The Grassy Point Development/Redevelopment project could also address this issue indirectly by encouraging redevelopment or retrofit of the site.



Natural and Cultural Resources

Natural and Cultural Resources are part of what defines a community for its residents, and they can also form an essential component of community resiliency. Natural systems such as wetlands and reefs help control floodwaters, and they cleanse pollutants from the water once the storm has passed. Floodplains provide additional storage space for stormwater overflow, and allow for gradual reabsorption of flood waters. They also contribute to residents' quality of life and bolster the local economy.

When natural systems are unnaturally altered or compromised, the systemic impact can be irreversible and irreparable, underscoring the need for considerable long-term support and protection.

Some of Stony Point's natural and cultural resources were spared damage during Hurricane Irene and Superstorm Sandy while others—including Lowland Hills Park, the parks along the Hudson River, King's Ferry Landing and Cedar Pond Brook—were all severely affected. Issues related to upland flooding

along Cedar Pond Brook were discussed by the Committee. The heavy precipitation that accompanied these storms resulted in flooding of and damage to local roadways, limiting access by emergency service providers to certain areas of the town. Damage to the parks has been addressed, including the installation of a new town pier and the replacement of a mobile bathhouse that can be moved in advance of a storm. Cedar Pond Brook and the old King's Ferry Landing still show scars from the damage sustained.

Leveraging Natural and Cultural Resources to Achieve Other Goals

An opportunity exists in Stony Point to leverage the town's natural and cultural resources to address several needs expressed by the Committee and public, including economic development and

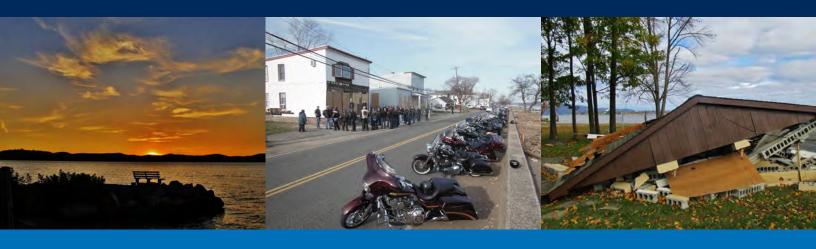
shoreline protection. The potential of Stony Point's natural and cultural resources to further these goals is largely untapped. Expanding access to these resources and linking them to the downtown area, by extending hiking or kayak trails to connect with the waterfront or improved shuttle or public transportation options, would be a boon for Stony Point's economic development. More aggressive, coordinated promotion of the State Parks, Stony Point Battlefield, and other local resources as tourist destinations would likewise be a great benefit for the town's economy. Similarly, nurturing Stony Point's natural resources along the waterfront would improve these aesthetic, ecological and economic resources while also strengthening the resiliency of the shoreline against storm surge and wave action.



2014 NY RISING COMMUNITY RECONSTRUCTION PLAN

NYRCR STONY POINT

Section III
Reconstruction and Resiliency Strategies







Reconstruction and Resiliency Strategies

As a waterfront community with historic and ongoing ties to the Hudson River, Stony Point is poised to reconsider its flood-prone areas in a manner that revitalizes the Town's waterfront and economic base.

In order to guide the process of selecting projects and actions, the Stony Point NYRCR Planning Committee developed a list of strategies to achieve rebuilding, resilience, and economic growth. The foundations for this list are the Vision and Goals, Needs, and Opportunities identified and refined by the Committee with input from the larger Stony Point community. This list was also based on the inventory of community assets and known areas of vulnerability, as well as flood, wind, and other damage resulting from the storms. Strategies will be implemented through projects that may include management measures, policies, and programs that the community carries out and the actions it takes to restore and protect assets.

The strategies proposed in this Stony Point NYRCR Plan consider emergency, disaster recovery, and long-term resilience, as well as those economic development needs that remain unmet by existing planning and rebuilding initiatives.

The strategies are statements of action that address how to best fortify community assets, capitalize on opportunities, resolve critical issues, and meet short-, medium-, and long-term goals identified during the planning process. These goals and initiatives formed the foundation of the reconstruction and resiliency strategies, which were developed to help the communities devastated by Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy move forward and identify mitigation measures that will prevent future damages and avoid the negative impacts of future flood events.

Strategy 1: Strengthen current short- and long-term emergency shelters and develop new sheltering opportunities.

With the increasing frequency of major storm events in New York State, the Committee expects that the number of residents requiring access to emergency shelters will only increase in the coming decades. With this in mind, increasing the capacity and resilience of the Town's existing storm shelters while building more shelter capacity is an important priority for Stony Point. The Stony Point Center, the main existing shelter facility in Town, is in need of electrical generation capacity and lacks smooth pedestrian connections to important services that displaced populations require. During heavy rains, roadway access can be cut off by flooding, necessitating stormwater management improvements on the property. The Committee is also interested in pursuing a short-term shelter and recovery processing center, which could be located at another location, such as the municipal complex at Letchworth Village.

Table III-1
Strategy 1: Strengthen current short- and long-term emergency shelters and develop new sheltering opportunities

Project Name	Description	Estimated Cost	Category	Regional Project
Letchworth Village Disaster Recovery and Communications Center	Set up a short-term emergency/disaster recovery center, a cooling center, and an Emergency Operations Command Center (EOCC). The RHO Building would serve as the emergency/disaster recovery center and be a central processing location for all residents in need of assistance during and after disaster events. The Police Station would serve as a flexible communications command center to accommodate a variety of emergencies, and to coordinate the activities of all emergency responders mainly through radio communications, and internet connections, in real time.	\$805,000	Proposed Project	No
Stony Point Center Retrofit	The Stony Point Center is a FEMA-approved Emergency Lodging Assistance Program site, and housed displaced residents for up to three months after Superstorm Sandy. However, the facility has experienced flooding of the main building and entry road as well as loss of power during storm events. In order to better equip the Center to support displaced residents during and after future storms, this project would install backup generators and make enhancements to the Center's stormwater management system.	\$207,000	Proposed Project	No

In addition to the Proposed Projects presented in Table III-1, the Committee also identified one Additional Resiliency Recommendation to pursue this strategy. This measure is listed with full details in Section V.A. Additional Resiliency Recommendations.

Strategy 2: Encourage economic development and support existing businesses.

From the outset, many of the stories the Committee told and the aspirations for Stony Point that they voiced contained a common theme: a critical component of the Town's economic engine was solidly anchored to the waterfront. Four things became clear:

- The damage to waterfront businesses sustained during the recent storms was a set-back to the local economy;
- The owners of these economic engines required additional support to recover fully;
- The waterfront was a "diamond in the rough" for the potential it holds; and
- 4. Plans were needed to further develop tourism.

The Stony Point Community envisioned "...attracting visitors to ensure an ecologically sound and economically strong future..." (Stony Point NYRCR Vision Statement) and established a goal to "Enhance historical, natural, and cultural attractions for tourists" (Stony Point NYRCR Goals).



The US Gypsum plant on Grassy Point is currently not being used and could be a redevelopment site (Jason Hellendrung)

Waterfront development and redevelopment is a key to fulfilling that vision. This is especially true in light of the poor condition of portions of the shoreline since Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy. There exist many opportunities for new appropriate uses near the waterfront, which would enhance the Town's economic base and expand appreciation of the Hudson River. A waterfront economic development strategy, supported by the Committee as a Proposed Project, must focus on increasing appropriate water-dependent and water-enhanced economic activity, which would include promoting tourism, the marinas, and outdoor activities appropriate for a shoreline location. Similarly, an effort must be made to act on strategies presented in EPA Technical Assistance for Sustainable Communities: Stony Point (2012) for sustainable economic development, including recommendations for combining hazard mitigation planning with economic development plans. The Community also indicated that there was a need to diversify the businesses and uses of the Liberty Drive/ Route 9W Corridor, with a goal of revitalizing this key economic center. The need to tie these two economic areas together was discussed and projects associated with providing both pedestrian and public transportation access between the two were developed.

Developing a stronger and more resilient economic base is one of Stony Point's critical issues, and a waterfront economic development strategy would be an important step in the right direction. Strengthening lines of communication and collaboration between local government and the business community is of critical importance to this strategy.

In addition to the Proposed Project presented in Table III-2, the Committee also identified Additional Resiliency Recommendations to pursue this strategy. These measures are listed in their entirety in Section V.A. Additional Resiliency Recommendations.

Strategy 3: Improve on existing emergency preparedness, response and communications.

The Stony Point NYRCR Committee envisioned an NYRCR Plan that would "protect our people and our natural resources while making the community more resilient in the face of future hazards" (Stony Point NYRCR Vision). A key implementing goal of this Vision was to "Foster emergency readiness" (Stony Point NYRCR Goals).

To achieve this goal, the Committee identified projects and actions that would improve and build on the Town's existing emergency preparedness, response and communications systems. Focused improvements in the way that existing information is provided to the public, including citizen education, were made a priority based on the Committee's articulation of this need. A central emergency operations and communications center was identified by the Committee as a

Table III-2
Strategy 2: Encourage economic development and support existing businesses

Project Name	Description	Estimated Cost	Category	Regional Project
Grassy Point Development / Redevelopment	Develop a master plan for Grassy Point, which would address resiliency through methods to manage sea level rise. The plan would also seek to further public use, including tourism and education, and promote appropriate economic development and resilient water-dependent uses. The plan would consider both private and public lands on Grassy Point and present a variety of potential future uses in conceptual form.	\$175,000	Proposed Project	No

key asset to be improved upon; while such a facility does exist, it does not have the capacity to direct all emergency operations from a single location, nor can it send out communications to all residents. The proposed improvements would also include development of a comprehensive emergency plan for the Town, with procedures, evacuation routes, signage, regular communication with residents regarding emergency protocols, and an educational program to ensure all residents understand the emergency systems in place.

In addition to the Proposed Project presented in Table III-3, the Committee also identified Additional Resiliency Recommendations to pursue this strategy. These measures are listed in their entirety in Section V.A. Additional Resiliency Recommendations.

Strategy 4: Provide information and assistance to homeowners with pre-storm flood-proofing and post-storm repair, buyouts and demolition.

Residents' homes suffered damages ranging from flooded basements and the destruction of mechanical equipment to catastrophic damage and ultimately loss of structures due to substantial wave action. These individuals then had to seek shelter in unfamiliar environs, some with very few personal belongings in tow. The stress associated with such a dramatic upheaval is significant and compounded by many

things including the uncertainty associated with when, or worse, if they can move back into their home. After the storm began to fade, residents were frustrated with the lack of information available related to recovery procedures and funding, including available assistance for repair and buyout opportunities as well as the option of demolition and relocation.



Many houses in Stony Point are still in critical condition, one and a half years after Superstorm Sandy (Thomas McGuire)

Even though homes have been repaired and one has been raised, many others remain damaged, some irreparably. Residents need to understand all recovery options to ensure that they will have the ability to make the most informed decision on how to move forward. While the focus here is on post-storm con-

Table III-3
Strategy 3: Improve on existing emergency preparedness, response and communications

Project Nam	Description	Estimated Cost	Category	Regional Project
Letchworth Village Disaster Recovery and Communications Center		\$805,000	Proposed Project	No

cerns, the community would also benefit from information on and assistance with flood-proofing, armoring and elevating homes in advance of storm events.

The Stony Point community envisioned that a successful NYRCR process would "...protect our people..." (Stony Point NYRCR Vision Statement). To achieve this vision, the Committee set goals to "Foster emergency readiness" and "Develop design and construction standards for resilience" (Stony Point NYRCR Goals).

Improvement in the resiliency of the Town's housing stock is an issue critical to the community. An opportunity exists to provide housing elsewhere in the Town. The Committee felt that this could be accomplished through a project to assess the potential for alternate low income housing locations as a way forward to reduce risk to the vulnerable population that resides in the mobile home parks that sustained damage during the storms.

Additionally, homeowner education and funding for flood damage prevention was acknowledged as a key housing issue and the desire to address the vulnerability of the existing housing stock was identified as a need. Homeowners require assistance in planning, rebuilding, and modernizing their homes to withstand future storm events. Through measures including elevation changes to existing homes, land acquisition and relocation away from the most vulnerable regions of the Town, and general flood proofing, homeowners can

safeguard themselves and their most important assets. When a home is significantly damaged and the cost to repair is too high for the homeowner to cover, it is critical to provide information to the homeowner on buyout opportunities and/or home demolition and relocation options.

Part of this education initiative must include examination of the existing Town code to ensure there is proper language in ordinances to protect properties from future flooding and to ensure that new construction provides adequate flood damage prevention. The Town recently adopted the post Superstorm Sandy advisory base flood elevations into the local Flood Damage Prevention Law (Chapter 112 of the Town Code). To assist homeowners in complying with the need to raise their home, the Town also amended the Town Code (Section 215 – Zoning) to allow variances for exceeding height restriction.

Consideration must be given to long-term resilience should storm frequency or flood elevations increase in the future. This strategy must also include assessment of the community's ability to apply for/administer flood mitigation and community revitalization funds to ensure long-term implementation of the NY Rising Plan. Finally, the Town's participation in the FEMA National Flood Insurance Program (NFIP) Community Rating System (CRS) would increase resilience and reduce flood insurance rates for residents improving the economics of homeownership in areas prone to flooding.

Table III-4
Strategy 4: Provide information and assistance to homeowners with pre-storm flood-proofing and post-storm repair, buyouts and demolition.

Project Name	Description	Estimated Cost	Category	Regional Project
Demolition of Damaged and Abandoned Structures	While many residents have rebuilt waterfront homes after they were damaged by Hurricane Irene and Superstorm Sandy, there remain a number of structures along Stony Point's Hudson River shoreline that are unimproved and boarded up. This project would acquire four such structures, all privately-owned single family homes, and demolish them in order to eliminate potential hazard and blight. These parcels would then be incorporated into the Town Park network.	\$1,252,000	Featured Project	No

Table III-5
Strategy 5: Promote sustainability and resilience through local land use planning and regulation

Project Name	Description	Estimated Cost	Category	Regional Project
Grassy Point Development / Redevelopment	Develop a master plan for Grassy Point, which would address resiliency through methods to manage sea level rise. The plan would also seek to further public use, including tourism and education, and promote appropriate economic development and resilient water-dependent uses. The plan would consider both private and public lands on Grassy Point and present a variety of potential future uses in conceptual form.	\$175,000	Proposed Project	No

In addition to the Proposed Project presented in Table III-4, the Committee also identified Additional Resiliency Recommendations to pursue this strategy. These measures are listed in their entirety in Section V.A. Additional Resiliency Recommendations.

Strategy 5: Promote sustainability and resilience through local land use planning and regulation.

In the face of storm damages and with the vulnerable location on the waterfront, sensitive planning can position Stony Point for resiliency. The Committee is interested in exploring opportunities for avoiding the impacts of natural disasters by revisiting its existing planning documents with an eye toward sustainability and resilience. The Town's existing Master Plan and Local Waterfront Revitalization Program (LWRP) can be tailored to cater to the vulnerabilities exposed by Superstorm Sandy, Tropical Storm Lee and Hurricane Irene. The Committee feels that a comprehensive plan for the Grassy Point neighborhood would be an excellent vehicle for finding ways to strengthen the Town's waterfront economy while providing more open space and a more resilient and inclusive housing stock; such a plan could ensure resilient construction by codifying the use of the latest flood resistant materials and building techniques. Improvements to local planning practices would also take the form of a marina protection and harbor management plan, and an examination of the zoning code to facilitate the rebuilding of damaged homes, buildings and infrastructure.

In addition to the Proposed Project presented in Table III-5, the Committee also identified Additional

Resiliency Recommendations to pursue this strategy. These measures are listed in their entirety in Section V.A. Additional Resiliency Recommendations.

Strategy 6: Repair, rehabilitate, upgrade and fortify critical infrastructure and transportation.

Stony Point's critical infrastructure – including roadways, wastewater treatment, electricity and stormwater management – was adversely affected by Hurricane Irene, Tropical Storm Lee and Superstorm Sandy. With those damages in mind, the visioning process established goals to "improve waterfront access and infrastructure" and "plan for better mobility and connectivity for people in cars, on foot, and with transit." Repairing and fortifying the shoreline infrastructure to better withstand future storm events and enhancing transit are important priorities for the Committee.



The Cedar Pond Brook interceptor sewer line is currently exposed after being undermined during Superstorm Sandy (Kevin Maher)

Table III-6
Strategy 6: Repair, rehabilitate, upgrade and fortify critical infrastructure and transportation

Project Name	Description	Estimated Cost	Category	Regional Project
Cedar Pond Brook Interceptor Sewer Line Rehabilitation	The Cedar Pond Brook Interceptor Sewer Line is a major feeder line for the Stony Point Wastewater Treatment Plant. The line and its wood-framed support structure were undermined and exposed during Hurricane Irene, Tropical Storm Lee and Superstorm Sandy, leaving the support structure in a weakened condition due to erosion of the berm that had covered the line. This project would repair and stabilize the approximately 1/3 mile section of the sewer line that is most at risk, and provide access to enable ongoing maintenance work.	\$15 million	Featured Project	No
Hardening of Wastewater Treatment Plant	During Superstorm Sandy, the Stony Point Wastewater Treatment Plant was flooded by storm surge from the Hudson, incurring approximately \$1 million in damages. This project seeks to secure the wastewater treatment plant against future flooding through installation of enclosed/submersible motors and controls, floodproof entry doors and windows, installing new or refurbishing existing electrical systems. Also included are the engineering, design and architectural services associated with these improvements.	\$1.6 million	Proposed Project	No
Rehabilitation of Wastewater Interceptors along Beach Road and the Ba Mar Sewer Line	This project proposes resilient construction techniques that will prevent inflow and infiltration into the sewer lines that flow into the Beach Road Pump Station and on into the Town's Wastewater Treatment Plant. This project would replace 20 manhole covers and install 20 vents to prevent storm and tidal water intrusion into the sewer lines during future flooding events and eliminate sewerage overflow along Beach Road and in the Ba Mar Mobile Home Park.	\$125,000	Proposed Project	No
Shoreline Protection Against Erosion and Wave Action (Beach Road)	The project includes half of the flooding/wave attenuation study that will be performed for the waterfront south of the battlefield park. Improvements to and/or rehabilitation of seawalls and bulkheads to protect resources and improve beach retention would be implemented. The design and installation of a wave energy attenuation system is covered under this project.	\$1 million	Proposed Project	No
Shoreline Protection Against Erosion and Wave Action (River Road)	The project includes half of the flooding/wave attenuation study that will be performed for the waterfront south of the battlefield park. Improvements to and/or rehabilitation of jetties and seawalls to protect resources and improve beach retention would be implemented. The design and installation of a wave energy attenuation system is covered under this project.	\$1.7 million	Proposed Project	No

Resiliency initiatives that would enable Stony Point's infrastructure systems to continue operating with minimal interruptions during and after future storm events are essential to the ongoing viability of the Town. Of the critical infrastructure systems seriously affected by Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy, most notable was the wastewater treatment system. The network of roads and bridges and the fuel system were also impacted by these disasters. Repairing and fortifying these infrastructure systems is imperative, as are development of new and enhanced capabilities including new back-up power

supplies for gas stations and shelters; transportation alternatives such as ferry, rail, and enhanced bicycle and pedestrian networks; and a more integrated and comprehensive system of shoreline defenses along the Hudson River waterfront.

In addition to the Proposed and Featured Projects presented in Table III-6, the Committee also identified Additional Resiliency Recommendations to pursue this strategy. These measures are listed in their entirety in Section V.A. Additional Resiliency Recommendations.

Strategy 7: Harness resiliency potential of natural resources.

The visioning process in Stony Point identified a strong desire in the Town to "Protect...our natural resources" and to "ensure an ecologically sound... future for the people of Stony Point." The Committee recognizes the importance of the Town's natural resources to a community that chose to describe itself as "a vibrant and connected riverfront and hillside community" (Vision Statement).

The Committee has indicated the potential for strategies to limit future damage in the vicinity of the shoreline through enhancements to the Town's natural resources such as wetlands, waterways, and shoreline. The preservation and restoration of these natural systems would allow them to serve as flood banking systems and buffer zones during storms, repel wave action, and otherwise protect the people and assets of Stony Point. Such a strategy would offer numerous co-benefits depending on the means used. Stream bank restoration to prevent erosion and protect nearby roads and buildings would also provide fishing areas and a more aesthetically pleasing upland environment for residents; oyster/mussel shoals and restored tidal wetlands would clean the water and provide habitat while reducing wave action and storing stormwater.



Stream bank erosion on Cedar Pond Brook after Hurricane Irene (Kevin Maher)

An enhanced natural environment also would bring greater economic opportunities from tourism. These numerous additional benefits make investments in natural resources a smart strategy.

Although the Committee did not raise any projects for this strategy to the level of Proposed or Featured, the Committee did identify Additional Resiliency Recommendations to pursue this strategy. These measures are listed in their entirety in Section V.A. Additional Resiliency Recommendations.

2014 NY RISING COMMUNITY RECONSTRUCTION PLAN

NYRCR STONY POINT

Section IV
Implementation - Project Profiles







Implementation – Project Profiles

NYRCR Stony Point is eligible for up to \$3.0 million in CDBG-DR implementation funds. 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.

This section presents detailed profiles for all Proposed and Featured Projects identified by the Stony Point NYRCR Planning Committee and community throughout the eight-month planning process. Each profile includes a detailed description, a map, plan, and/or photograph, and a summary of the Risk Mitigation and Cost-Benefit Analysis (CBA) completed for each Proposed and Featured Project. A brief description of the methodology for these models is provided below.

Proposed Projects are defined as those that would be funded through a 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.

Risk Mitigation Analysis

The Risk Mitigation Analysis evaluates the extent to which Proposed and Featured Projects will mitigate storm damage (environmental, social and economic) and flooding risk to specific community assets when the project is in place. (The extent to which a Project mitigates risk is also considered a benefit in the CBA—as described under "Project Benefits" in the section that follows.) Evaluating Risk "Mitigation" is different than the Risk "Assessment" process, which was described in detail in Section II of this NYRCR Stony Point Plan. The Risk Assessment evaluated storm and flood risks to community assets prior to

implementing the Project, whereas Risk Mitigation evaluates the reduced risk with the Project in place.

To determine how the implementation of Proposed and Featured Projects would impact the risk to assets and asset groups, the Consultant Team ran the Risk Assessment Tool for projects that are intended to reduce the risk of flood damage to assets. The result of this Risk Reduction Analysis is "mitigated" risk scores for assets and asset groups. The evaluation methodology included developing assumptions regarding exposure and/or vulnerability and altering these factors to reflect the effects of the project. A complete description of the Risk Mitigation methodology and results is included in Section V. Additional Materials of this NYRCR Stony Point Plan.

Cost Benefit Analysis Methodology

The CBA developed the benefits and costs associated with Proposed and Featured Projects. The CBA provides the anticipated cost of implementation and a primarily qualitative evaluation of the benefits of the various Proposed and Featured Projects. The purposes of the CBA are to inform the Committee as they formulate and prioritize projects for implementation and to help municipalities prepare grant applications for CDBG-DR funds and other funding opportunities identified in the future. The costs and benefits used to evaluate projects through the CBA are explained further below.

Project Costs

The Proposed and Featured Project Profiles include a summary of anticipated Project cost. For the sewer infrastructure projects, estimated costs developed in support of submissions for grant and permit applications were provided by the Town staff engineer and/or Town engineering and natural resources consultants. For the other projects, the Consultant Team developed preliminary cost estimates which included fees for construction, operation, and maintenance, as well as

overall life-cycle costs. Due to various uncertainties, the estimates are just that—estimates. They provide the community with a practical understanding of the potential estimated costs of project implementation.

The CBA not only provides an assessment of the cost of implementing the projects, but it also provides a description of the future costs of not implementing the Proposed and Featured Projects. If Projects are not implemented, the long-term ability of municipalities to withstand significant storm events and rebound afterward may be negatively impacted. The costs of not implementing projects are more difficult to quantify, but are nonetheless critical to the analysis and are therefore addressed qualitatively. These costs include: repetitive damage to personal property and public infrastructure resulting from frequent, recurring flooding and future storm events; economic loss to residents and local and regional employers as a result of the inability to work; and obstacles or limitations to the provision of life safety and emergency services resulting in the repeated inability to access certain areas of the community.

Project Benefits

The types of benefits evaluated in the CBA are summarized below:

- Risk Mitigation: The extent to which a Proposed or Featured Project mitigates the risk of damage to an identified community asset from a future storm event.
- Economic Resiliency: The potential for a Proposed or Featured Project to minimize costs and reduce the time required for the local economy to rebound from a storm event. Economic assessment data included, where applicable: an estimate of permanent jobs secured/added; relationship to, and/or furtherance of, Regional Economic Development Plan goals; potential for additional economic activity; and the net effect on local municipal expenditures.
- Health, Social, and Public Safety Services: The potential for a Proposed or Featured Project to benefit the overall population due to improved access to

health and social service facilities and public safety services; type and size of socially vulnerable population secured; and 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 implementation of a Proposed or Featured Project.

▶ Environmental Protection: The potential for a Proposed or Featured Project to protect critical environmental assets, high-priority habitat, threatened and endangered species, migration or habitat connectivity; any environmental clean-up resulting from the action; creation of open space or new recreational assets.

Letchworth Village Disaster Recovery and Communications Center

Project Description: During Superstorm Sandy, numerous Town residents sheltered in the basement of the police station, which also houses the Town's emergency response center. As a result, the station was overcrowded for both residents and emergency services providers. A larger facility is needed for similar storms in the future, as well as an enhanced emergency communications center. This project would set up a short-term emergency/disaster recovery center, a cooling center, and an Emergency Operations Command Center (EOCC). The RHO* Building would serve as the emergency/disaster recovery center and be a central processing location for all residents in need of assistance during and after disaster events. The Police Station would serve as a flexible communications command center to accommodate a variety of emergencies, and to coordinate the activities of all emergency responders in real time, mainly through radio communications and internet connections.

Estimated Cost: \$805,000

Anticipated Regulatory Requirements:

Local approvals - building permits, etc. are anticipated.

Anticipated Timeframe: 6-12 Months

Entity with Jurisdiction: Town of Stony Point

Anticipated Risk Reduction: Improved storm shelter and emergency recovery facilities will improve emergency preparedness, response and communications and contribute to a coordinated and effective response to future disaster events.

Cost Benefit Summary: Implementation of this project would provide a short-term emergency/disaster recovery center with an extended useful life. Potential environmental effects of new construction would require additional assessment. Opportunity costs do exist since benefits associated with other potential uses of the site would be lost. However, this project has the potential to generate economic activity throughout construction and rehabilitation.

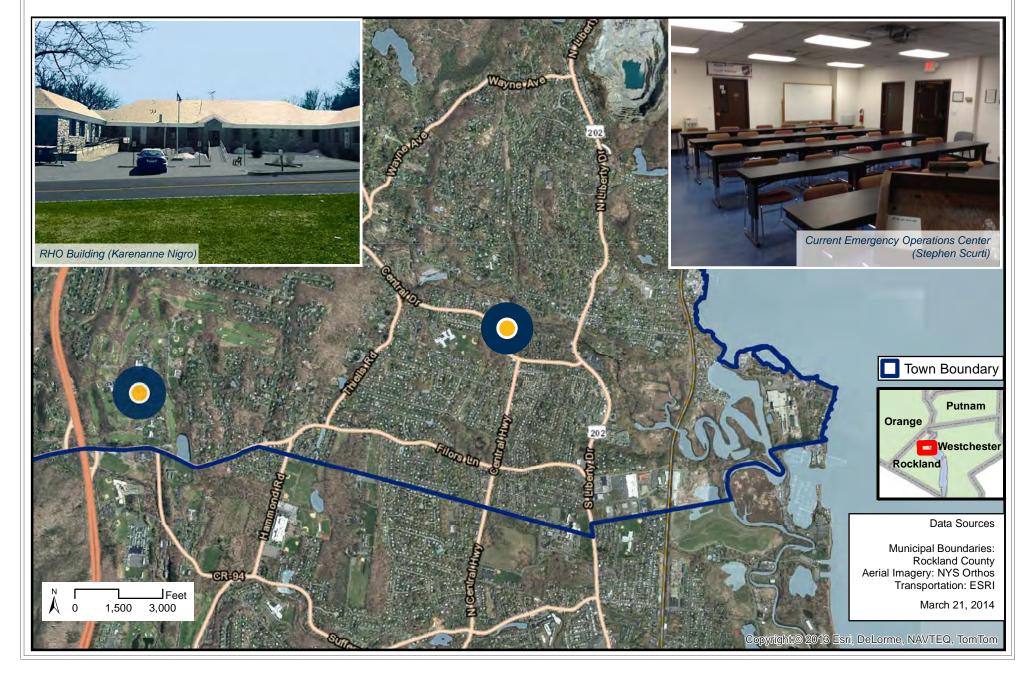
Co-Benefits of Project:

- <u>Economic Benefits</u>: An emergency/disaster recovery center would allow for a more efficient distribution of provisions and services and for a more coordinated, real-time response to emergencies, thereby allowing for savings in local government expenditure. More efficient distribution of information would foster shorter recovery times for residents and businesses, leading to an earlier restoration of economic activity and a more resilient economy overall.
- Health and Social Service Benefits: The project will allow residents who lost their homes, either temporarily or permanently, a safe and secure location to obtain information that will help them in recovering from the loss. The emergency operations command center will allow for full coordination between first responders that service the Town, a benefit for the entire community.

*RHO is the name of the 17th letter of the Greek alphabet. All of the buildings at Letchworth Village were named after Greek letters when the facility was built in the early 1900s.

Figure IV-1 Project Location - Letchworth Village Disaster Recovery Center





Stony Point Center Retrofit

Project Description: The Stony Point Center is Emergency FEMA-approved Lodging Assistance Program site, and housed displaced residents for up to three months after Superstorm Sandy. However, the facility has experienced flooding of the main building and entry road as well as loss of power during Hurricane Irene, Superstorm Sandy, and other events. Flooding is exacerbated by an improperly designed stormwater conveyance system on the property which causes stormwater to back up into the Stony Point Center's roadway and main building. In order to better equip the Center to support displaced residents during and after future storms and address the flooding, this project would install two backup generators and replace the stormwater conveyance system on site.

Estimated Cost: \$207,000

Anticipated Regulatory Requirements:

Potential regulatory constraints include NYS DEC for stormwater management and Town approvals.

Anticipated Timeframe: 6-12 Months

Entity with Jurisdiction: Town of Stony Point

Anticipated Risk Reduction: Installation of the redesigned stormwater management system will reduce the discharge of stormwater from an existing stormwater management feature (detention pond) onto the property and eliminate the backing up of stormwater at the front entrance to the building. The proposed stormwater management measures will also improve the vulnerability of the asset by maintaining access to the Center. Installation of backup generators will further decrease the asset's vulnerability.

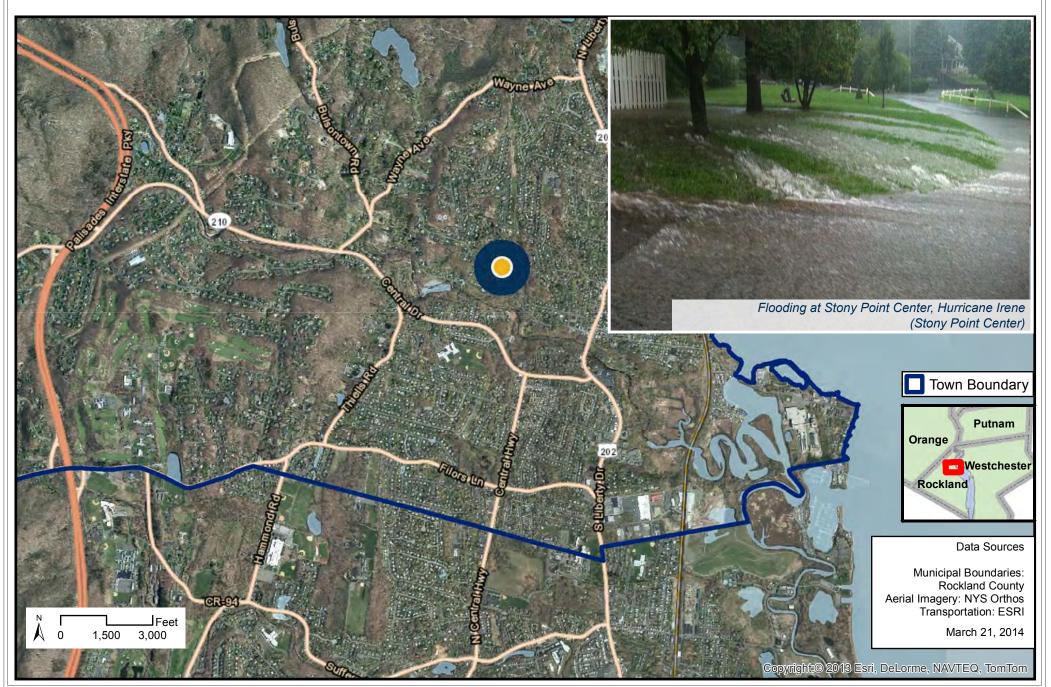
Cost Benefit Summary: The new stormwater connection to the existing storm sewer will reduce the risk of future flooding of the Stony Point Center for up to 50 years. This project will reduce flooding of the main drive which provides access for emergency vehicles and patrons. The backup generators, with a useful life of up to 20 years, will maintain electricity at the two main buildings during extreme weather events. With a new stormwater connection and consistent electrical power, the Stony Point Center will be better equipped to support displaced residents and employment at the facility will be maintained even during significant storm events and power outages, securing upwards of 50 jobs¹. A reduced reliance on public provision of resources during emergencies will also result from the implementation of this project. Additional economic activity would be expected through tourism at the Stony Point Center. Further savings in local government expenditures are expected since reduced flooding would lower reconstruction costs following future storm events.

- Economic Benefits: The new stormwater connection will reduce the risk of future flooding of the Stony Point Center and the backup generators will maintain power, thereby enabling the Center to remain open and continue to generate economic activity.
- Environmental Benefits: The new stormwater connection would ease future flooding. Improvements to water quality would be expected as flood waters in the building carry pollutants into the Cedar Pond Brook.
- Health and Social Service Benefits: The entire Town will benefit from the Stony Point Center's increased ability to provide disaster relief services to those most in need. The project will provide residents who lost their homes, either temporarily or permanently, the ability to stay in the community. Children can continue to attend their schools and adults can continue to go to work and rely on their neighbors and friends in the area for support.

A complete description of the methodology used to develop employment numbers is included in Section V. Additional Materials

Figure IV-2 Project Location - Stony Point Center Retrofit





Shoreline Protection Against Erosion and Wave Action (Beach Road)

Project Description: Stony Point's waterfront was severely impacted during Hurricane Irene and Superstorm Sandy by storm surge and wave action. This project would select from a variety of methods for dissipating wave energy to protect existing homes, facilities, infrastructure, and other shoreline resources. Improvements to and rehabilitation of seawalls and bulkheads to protect resources and improve beach retention would be implemented. Installation of a wave attenuation system would protect shoreline resources from the devastating effects of waves breaking on unprotected structures. The project includes half of a flooding/wave attenuation study that would be performed for the Stony Point waterfront, from the battlefield south to the Town line.

Estimated Cost: \$1 million

Anticipated Regulatory Requirements:

Regulatory constraints are anticipated including the • need for approvals from USACE, NYS DEC (Article 15), and NYS DOS. Also coordination with Rockland County as some of these protective features are under their jurisdiction.

Anticipated Timeframe: 24 Months assuming • Nationwide Permit from USACE

Entity with Jurisdiction: Town of Stony Point, **Rockland County**

Anticipated Risk Reduction: Implementation of this project will result in the construction of physical shore defense structures along the Beach Road shoreline that will reduce the exposure of the following assets: Beach Road Economic Assets (Patsy's Bay Marina I and II, Stony Point Bay Marina, Seaweed Yacht Club, TZ Marine Services), Beach Road Sewage Pump Station, Beach Road Interceptor Sewer, Beach Road, Vincent A. Clark Riverview Park & Kayak Access, and Beach Road Housing.

Cost Benefit Summary: Implementation of this project would provide medium-term benefits since improving and/or stabilizing seawalls and bulkheads would have a useful life of 10 to 20 years. Although no permanent jobs are expected to be added, there is potential for increased economic activity since improved conditions at Vincent Clark Park may attract additional visitors. This project would support the Mid-Hudson regional economic goal of leveraging natural resources as drivers of tourism and quality-of-life benefits. Savings in local government expenditure are expected since the project would reduce flooding risk, improve access for emergency vehicles, and limit the cost of reconstruction and rehabilitation to nearby homes, facilities, infrastructure and other resources.

- Economic Benefits: As a result of this project, flooding and wave damage from extreme weather events would be reduced, limiting the cost and time to reconstruct and rehabilitate after such an event. The reduced cost and time involved in rebuilding would translate into greater availability of resources for enhanced economic activity. No opportunity costs were identified.
- Environmental Benefits: The Hudson River is mapped by the NYSDEC as a Significant Natural Community - a "tidal river." Shoreline protection measures would serve to secure and protect this habitat from coastal erosion and the deposition of sediment and debris in the form of damaged structures, boats, docks and infrastructure by minimizing tidal surge and reducing wave action in "V" zones.
- Health and Social Service Benefits: The reduction in roadway inundation and potential impacts to residences resulting from shoreline protection projects will benefit the shoreline communities by reducing the duration of roadway flooding, thereby maximizing access to these areas by emergency services personnel and vehicles.

Figure IV-3 Project Location - Shoreline Protection: Beach Road





Shoreline Protection Against Erosion and Wave Action (River Road)

Project Description: Stony Point's waterfront was severely impacted during Hurricane Irene and Superstorm Sandy by storm surge and wave action. This project would select from a variety of methods for dissipating wave energy to protect existing homes, facilities, infrastructure, and other shoreline resources. Improvements to and rehabilitation of jetties and seawalls to protect resources and improve beach retention would be implemented. Installation of a wave attenuation system would protect shoreline resources from the devastating effects of waves breaking on unprotected structures. The project includes half of a flooding/wave attenuation study that would be performed for the Stony Point waterfront, from the battlefield south to the Town line.

Estimated Cost: \$1.7 million

Anticipated Regulatory Requirements:

Regulatory constraints are anticipated including the need for approvals from USACE, NYS DEC (Article 15), and NYS DOS. Also coordination with Rockland County as some of these protective features are under their jurisdiction.

Anticipated Timeframe: 24 Months assuming Nationwide Permit from USACE

Entity with Jurisdiction: Town of Stony Point, **Rockland County**

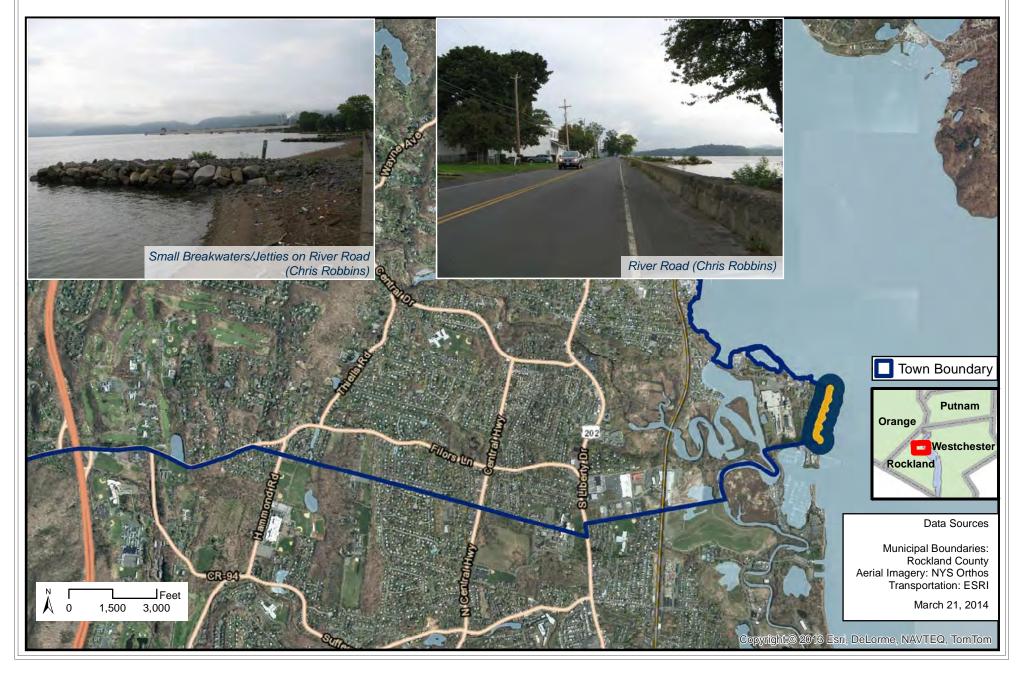
Anticipated Risk Reduction: Implementation of this project will result in the construction of physical shore defense structures along the River Road shoreline that will reduce the exposure of the following assets: River Road, River Road Housing, US Gypsum Manufacturing Facility, PANCO Petroleum site, Gilligan's on the Hudson, and the Wastewater Treatment Plant.

Cost Benefit Summary: Implementation of this project would provide medium-term benefits since improving and/or rehabilitating jetties and seawalls would have a useful life of 10 to 20 years. Although no permanent jobs are expected to be added, there is potential for increased economic activity since improved conditions at Riverfront Park may attract additional visitors. This project would support the Mid-Hudson regional economic goal of leveraging natural resources as drivers of tourism and quality-of-life benefits. Savings in local government expenditure are expected since the project would reduce flooding risk, improve access for emergency vehicles and limit the cost of reconstruction and rehabilitation to nearby homes, facilities, infrastructure and other resources.

- Economic Benefits: As a result of this project, flooding and wave damage from extreme weather events would be reduced, limiting the cost and time to reconstruct and rehabilitate after such an event. The reduced cost and time involved in rebuilding would translate into greater availability of resources for enhanced economic activity. No opportunity costs were identified.
- Environmental Benefits: The Hudson River is mapped by the NYSDEC as a Significant Natural Community - a "tidal river." Shoreline protection measures would serve to secure and protect this habitat from coastal erosion and the deposition of sediment and debris in the form of damaged structures, boats, docks and infrastructure by minimizing tidal surge and reducing wave action in "V" zones.
- Health and Social Service Benefits: The reduction in roadway inundation and potential impacts to residences resulting from shoreline protection projects will benefit the shoreline communities by reducing the duration of roadway flooding, thereby maximizing access to these areas by emergency services personnel and vehicles.

Figure IV-4 Project Location - Shoreline Protection: River Road





Rehabilitation Wastewater Interceptors along Beach Road and the **Ba Mar Sewer Line**

Project Description: During Superstorm Sandy, water flowed into the interceptor lines through unsecured manhole covers, adding significant freshwater to the wastewater treatment system and causing sewerage overflow into surrounding neighborhoods, wetlands and watercourses. This project proposes resilient construction techniques that will prevent inflow into the sewer lines that flow into the Beach Road Pump Station. Replacement of 20 manhole covers and installation of 20 vents to prevent storm and tidal water intrusion into the sewer lines will eliminate sewerage overflow along Beach Road, in the Ba Mar Mobile Home Park and into the environment. Reduction in the volume of freshwater conveyed to the WWTP will also be realized.

Estimated Cost: \$125,000

Anticipated Regulatory Requirements:

Regulatory constraints are anticipated including the need for approvals from NYS DEC (may require Article 24 permit depending on specific activities proposed). Also coordination with Rockland County as Beach Road is a County road.

Anticipated Timeframe: 4-8 Months

Entity with Jurisdiction: Town of Stony Point;

Rockland County

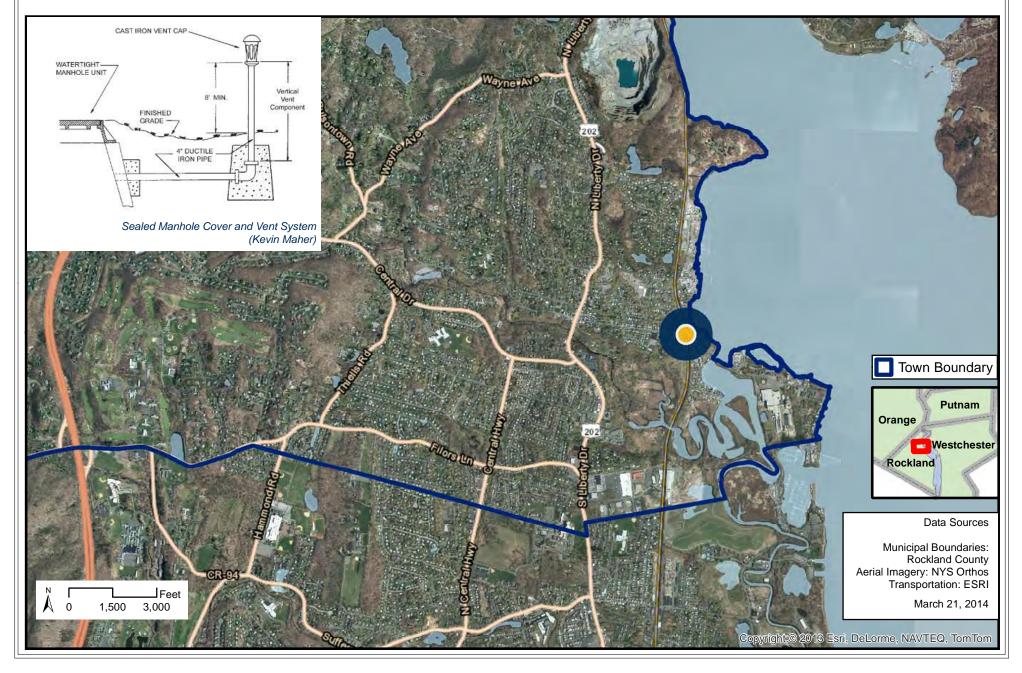
Anticipated Risk Reduction: Installation of sealed manhole covers and accompanying vents along the sewer line constitute defensive and protective measures. The proposed improvements will reduce the exposure of the asset to floodwater and reduce its vulnerability.

Cost Benefit Summary: Manhole covers and vents are expected to have a useful life of 20+ years. The benefits of securing the wastewater stream from inflow and infiltration so that the Beach Road pump station and the wastewater treatment plant do not process freshwater are long-term, as is protection of the local environment from sewage overflow. This project would support the Mid-Hudson regional economic goal of investing in infrastructure improvements, including sewer infrastructure. These improvements would reduce the level of emergency response needed during and after extreme weather events to manage and remediate sewage release to local neighborhoods and the environment.

- Economic Benefits: Improvements to manhole covers and vents would secure the wastewater system against inflow of floodwater, which would result in a long-term benefit to the community in terms of savings on infrastructure expenditures. In addition, reducing the volume of freshwater entering and overwhelming the wastewater system could lead to further savings in local government expenditure by eliminating the need for the conveyance of sewage through the town bypass system and into the wastewater treatment facility in Haverstraw, which charges the Town of Stony Point to process the sewage. No negative externalities or opportunity costs were identified.
- Environmental Benefits: The project will prevent environmental degradation of nearby wetlands, watercourses, and the Hudson River by reducing sewage overflows. The Hudson River is listed by NYSDEC as habitat for threatened and endangered species, including Atlantic and Shortnose Sturgeon. Prevention of the release of untreated sewage would avoid potential negative impacts on these fish species and other aquatic flora and fauna that use the Hudson River and Haverstraw Bay.
- Health and Social Service Benefits: Ensuring that all wastewater continues to be properly treated during and after storm events will benefit the overall health of the community.

Figure IV-5 Project Location - Rehabilitation of Wastewater Interceptors





Hardening of Wastewater Treatment Plant

Project Description: During Superstorm Sandy, the Stony Point Wastewater Treatment Plant was flooded by storm surge from the Hudson, incurring approximately \$1 million in damages. This project seeks to secure the wastewater treatment plant against future flooding installation through enclosed/submersible motors and controls as well as floodproof entry doors, bilco doors and first floor windows. The project also proposes installing new or refurbishing existing electrical systems to protect them from potential flooding. Included in this project is the engineering, design and architectural services associated with these improvements.

Estimated Cost: \$1.6 million

Anticipated Regulatory Requirements:

No regulatory constraints anticipated.

Anticipated Timeframe: 6-12 Months

Entity with Jurisdiction: Town of Stony Point

Anticipated Risk Reduction: As this project improves the asset's ability to withstand and recover from flooding, it reduces the asset's vulnerability.

Cost Benefit Summary: Securing the wastewater treatment plant against flooding would have the long term benefit of increasing the plant's resilience. This project would support the Mid-Hudson regional economic goal of investing in infrastructure improvements, including sewer infrastructure. Increased flood protection for the wastewater treatment plant would reduce the level of emergency response needed to protect the facility and power down during extreme weather events. Further savings in local government expenditure would be expected since this project would lower reconstruction costs following future storm events.

- <u>Economic Benefits</u>: The project would secure the plant against flooding, which would result in a long-term benefit to the community in terms of savings on infrastructure repair expenses. In addition, reducing the potential for a shutdown or failure of the wastewater treatment plant could lead to further savings in local government expenditure by eliminating the need for the conveyance of sewage through the town bypass system and into the wastewater treatment facility in Haverstraw, which charges the Town of Stony Point to process the sewage. No negative externalities or opportunity costs were identified.
- Environmental Benefits: The project would protect the wastewater treatment plant from future flooding that could lead to catastrophic failure and release of sewage to the environment, resulting in degradation of adjacent wetlands, watercourse and important fish habitat in Haverstraw Bay and beyond. The Hudson River is listed by NYSDEC as habitat for threatened and endangered species, including Atlantic and Shortnose Sturgeon. Prevention of the release of untreated sewage would avoid potential negative impacts on these fish species and other aquatic flora and fauna that use the Hudson River and Haverstraw Bay.
- Health and Social Service Benefits: Ensuring that all wastewater continues to be properly treated during and after storm events will benefit the overall health of the community.

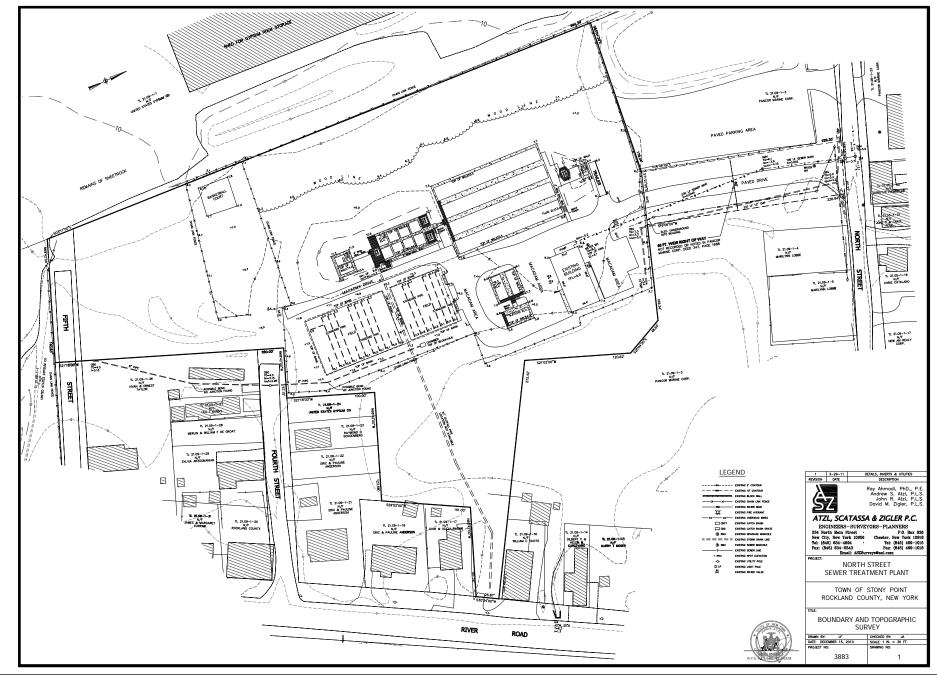
Figure IV-6 Project Location - Hardening of Wastewater Treatment Plant

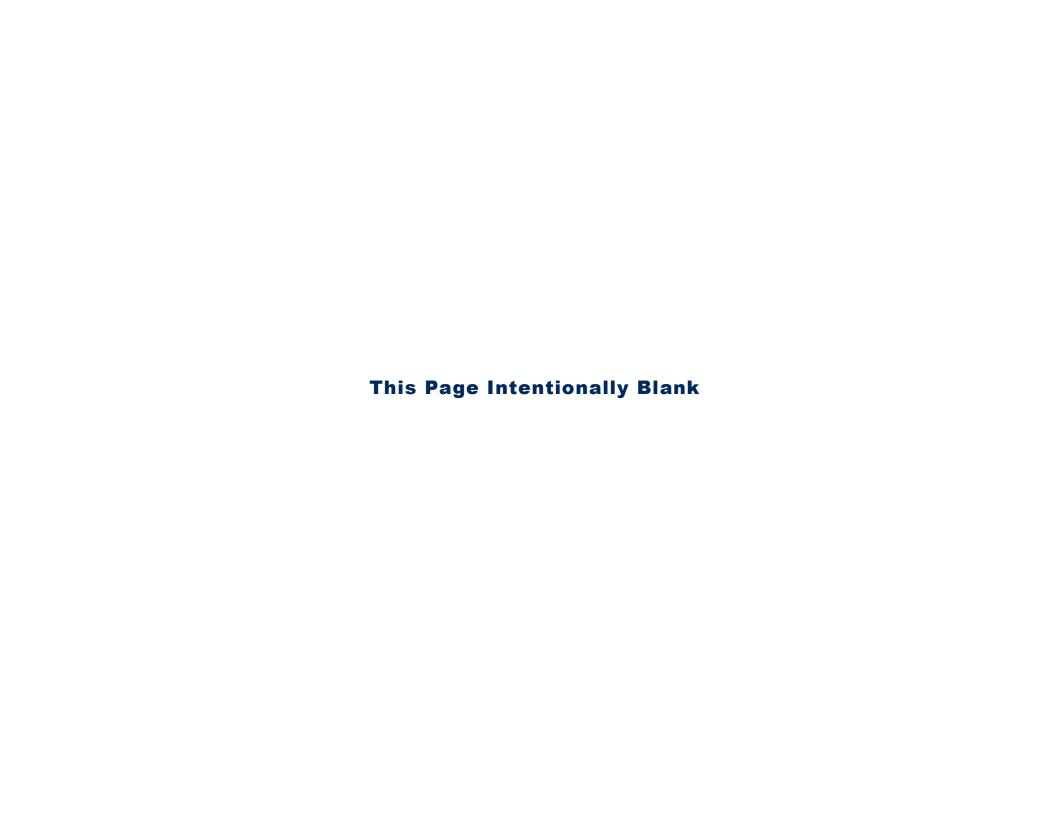




Figure IV-6-a Project Location - Hardening of Wastewater Treatment Plant







Grassy Point Development / Redevelopment

Project Description: Grassy Point is an important waterfront district in Stony Point, with great economic potential; the Town's diamond in the rough. Its location and topography leave it very exposed to the elements. The neighborhood was severely affected during Hurricane Irene and Superstorm Sandy by storm surge and wave action. This project would develop a Master Plan for Grassy Point, which would address resilience through methods to manage storm impacts and sea level rise. The plan would seek to further public use, including tourism and education, and promote appropriate economic development resilient water-dependent uses. Private and public lands on Grassy Point would be considered and a variety of potential future uses would be presented in conceptual form.

Estimated Cost: \$175,000

Anticipated Regulatory Requirements:

No regulatory constraints related to the master planning process are anticipated. Regulatory constraints are expected for implementation of some or all of the plan recommendations.

Anticipated Timeframe: 24 Months

Entity with Jurisdiction: Town of Stony Point;

Rockland County

Anticipated Risk Reduction: The Master Plan for Grassy Point would focus on developing resilient uses along the waterfront. The plan and any subsequent implementation efforts are expected to result in the construction of resilient structures, additional open spaces, and other measures that will improve the sustainability and resilience of area development and nearby uses. Beyond proposed new uses on the island, assets on Grassy Point that could benefit from a resiliency-focused plan include Grassy Point's housing stock, the Wastewater Treatment Plant, River Road and Grassy Point Road, River Front Park, the US Gypsum plant and water tower, Gilligan's on the Hudson, PANCO Petroleum, the Minisceongo Yacht Club/Marina, Surfside 3 at the Pennybridge Marina, and the Haverstraw kayak launch.

Cost Benefit Summary: A Master Plan for Grassy Point would provide long-term benefits to the community by improving resilience of existing and new development and addressing sealevel rise in this area, which is extremely susceptible to flooding. While the master planning effort would not secure or add new jobs, its implementation will likely improve protection of businesses along the shoreline. With less down time after a storm event, businesses would be better able to retain employees that might otherwise seek employment elsewhere as a result of a long recovery period. New employment opportunities resulting from the expected waterfront appropriate development identified in the plan would bring both temporary construction and permanent operational jobs to the area. An increase in economic activity (retail, industrial, construction, and tourism) is expected from the implementation of master plan recommendations. The implementation of resilience measures in the plan could result in a more efficient emergency response in the area, allowing Grassy Point to recover more quickly after an extreme weather event.

- Economic Benefits: The local and regional economies would benefit from a stronger waterfront, with local residents experiencing additional benefits. With the implementation of new resilience measures, Grassy Point would be better able to recover from future extreme weather events thereby bringing this economic engine back online more quickly. The plan could include new waterfront uses able to withstand storm surge and sea level rise, including uses that could provide greater access to the waterfront for both residents and visitors/tourists. An identified negative externality is the potential need to assess the environmental effects of construction at Grassy Point.
- Health and Social Service Benefits: Depending on the types of projects and improvements envisioned, the project may improve access to these services in the future.

Figure IV-7 Project Location - Grassy Point Development / Redevelopment





Cedar Pond Brook Interceptor Sewer Line Rehabilitation

Project Description: The Cedar Pond Brook Interceptor Sewer Line, a major feeder to the Stony Point Wastewater Treatment Plant, and its woodframed support structure were exposed during Hurricane Irene, Tropical Storm Lee and Superstorm Sandy, leaving the support structure in a weakened condition due to erosion of a protective berm. Should the line experience a catastrophic collapse due to undermining and deterioration of the aged and inadequate wooden support structure, raw sewage would be discharged into the Cedar Pond Brook, affecting public parks, fishing and bathing areas, and critical habitat areas of the Hudson River. This project would repair and stabilize the approximately 1/3 mile section of the sewer line that is most at risk, and provide access to enable ongoing maintenance work on the line.

Estimated Cost: \$15 million

Anticipated Regulatory Requirements:

NYS DEC (Article 24) and USACE permit for impact to State and Federally regulated wetlands. Possibly NYS DOT (Highway Work Permit) and Rockland County Drainage Agency approval.

Anticipated Timeframe: 12-24 Months dependent upon permitting and mitigation review process

Entity with Jurisdiction: Town of Stony Point

Anticipated Risk Reduction: Installation of protective structures on the Cedar Pond Brook Sewer Line would lower the asset's exposure during storm events. Overall repairs to the asset, including hardening and covering of exposed sections, will reduce its vulnerability.

Cost Benefit Summary: Repairing and stabilizing the interceptor sewer line would have a useful life of more than 20 years and would provide long-term benefits to the community. This project would support the Mid-Hudson regional economic goal of investing in infrastructure improvements, including sewer infrastructure. Savings in local government expenditures are expected since rehabilitation of the sewer line will eliminate the need for a crew to respond to a catastrophic failure of the line during and/or after future storm events. The implementation of the project would prevent the discharge of raw sewage into the Cedar Pond Brook, resulting in lower disaster recovery costs.

- Economic Benefits: Repairing and stabilizing the Cedar Pond Brook Interceptor Sewer Line would provide long-term, community-wide benefits resulting in a more resilient wastewater conveyance system. This would lower ongoing inspection and maintenance costs, as well as potential future repair costs. In addition, repairing and stabilizing the interceptor sewer line could lower disaster recovery costs by eliminating the need for the conveyance of sewage through the town bypass system and into the wastewater treatment facility in Haverstraw, which charges the Town of Stony Point to process the sewage. No negative externalities or opportunity costs have been identified.
- <u>Environmental Benefits</u>: The repair and stabilization of the sewer line will result in preventative environmental benefits by reducing the potential for sewage spills in the Cedar Pond Brook.
- Health and Social Service Benefits: Ensuring that all wastewater continues to be properly treated during and after storm events will benefit the overall health of the community and prevent interruptions in service during storm events.

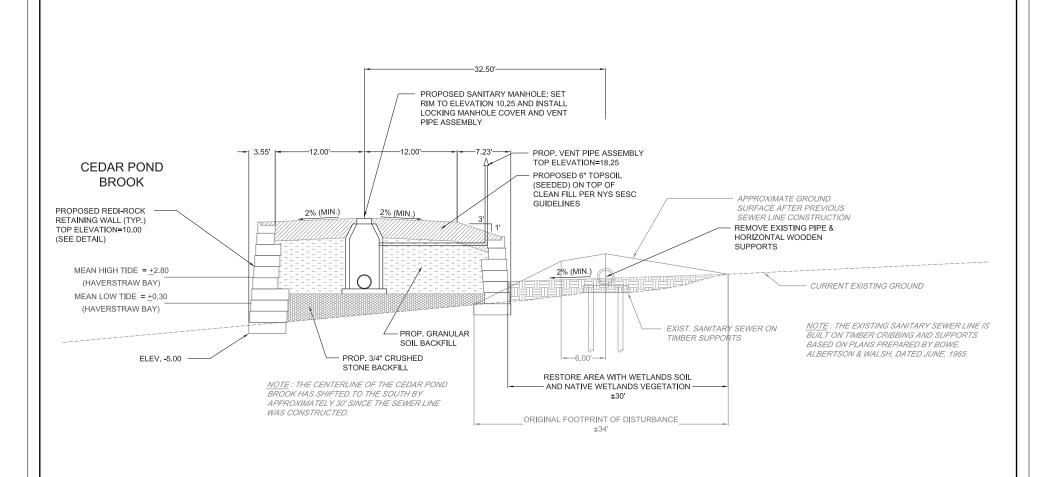
Figure IV-8 Project Location - Cedar Pond Brook Interceptor Sewer Line



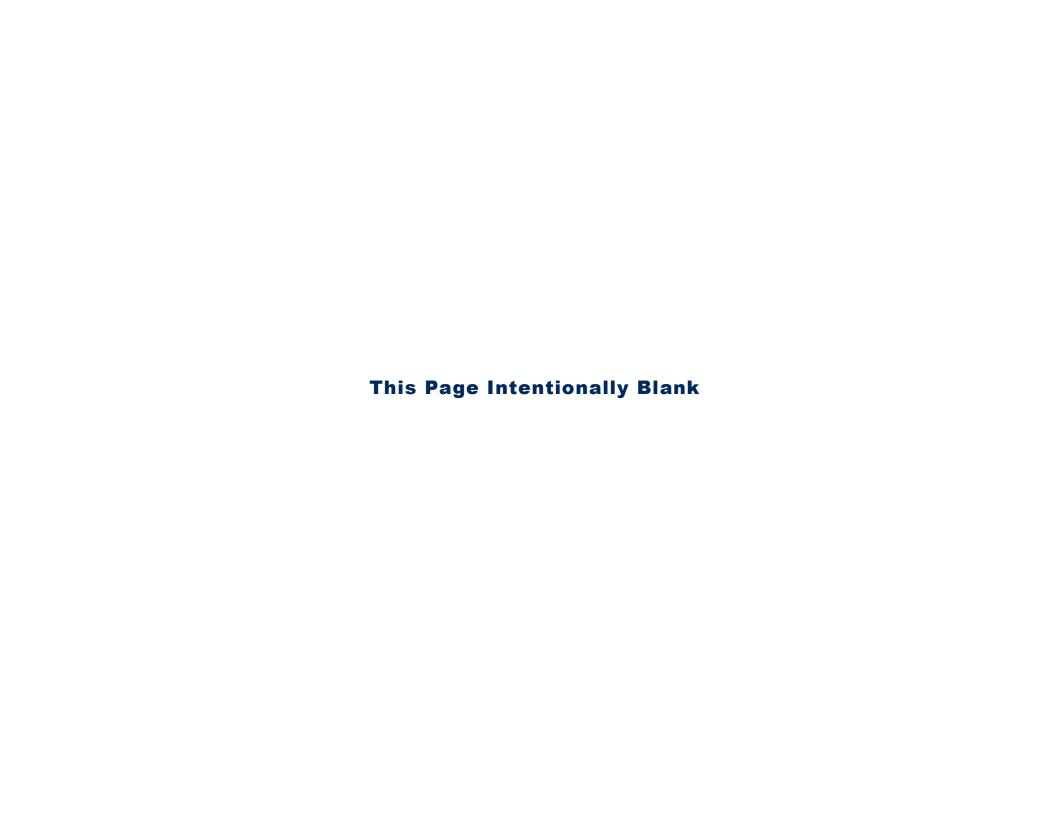


Figure IV-8-a Project Detail - Cedar Pond Brook Interceptor Sewer Line





SECTION THRU SANITARY SEWER BERM
NOT TO SCALE



Demolition of Damaged and Abandoned Structures

Project Description: While many residents have repaired or rebuilt waterfront homes after they were damaged by Hurricane Irene and Superstorm Sandy, there remain a number of residences along Stony Point's Hudson River shoreline that remain damaged and uninhabitable. Walls are missing, roofs have collapsed, yards are overgrown, windows and doors are boarded up and some are surrounded by hurricane fencing to protect residents. The result is twofold: certain areas along the Hudson River waterfront have a blighted appearance, and the damaged structures present a clear and present danger to the public. This project would acquire four such residences, all privately-owned single family homes, and demolish them in order to eliminate the existing hazard and blight. Once the structures are removed, the parcels would be incorporated into the Town Park network.

Estimated Cost: \$1,252,000

Anticipated Regulatory Requirements:

Local approvals – demolition permits, etc. are anticipated.

Anticipated Timeframe: 24 Months

Entity with Jurisdiction: Town of Stony Point

Anticipated Risk Reduction: Demolition of the damaged and abandoned structures along Stony Point's shoreline and incorporation of the properties into the park system would eliminate the possibility for new residential uses to be established on the affected properties, thereby reducing the number of residents and assets that are at risk of damage in future storms.

Cost Benefit Summary: Eliminating these abandoned and damaged structures would provide permanent protection to the community from existing hazard and blight. The affected parcels would be incorporated into the Town Park network, which would be a new, long-term open area resource for the entire community and visitors to the Town. This is in line with the Mid-Hudson regional economic goal of leveraging natural resources as drivers of tourism and quality-of-life attributes. In addition, once these houses are removed, the Town would no longer need to coordinate evacuation of residents and fence off damaged, abandoned structures, resulting in savings in local government expenditure.

- <u>Economic Benefits</u>: Although no permanent jobs will be added, this project would result in new open space, which would attract additional visitors to the community and boost economic activity. Additionally, the negative economic effects of blighted properties on the all-important waterfront would be eliminated.
- <u>Health and Social Service Benefits</u>: Removal of four homes would prevent potential health and safety impacts associated with abandoned structures.

Figure IV-9 Project Location - Demolition of Damaged / Abandoned Structures







(Chris Robbins)



(Chris Robbins)



Damaged House (Chris Robbins)



2014 NY RISING COMMUNITY RECONSTRUCTION PLAN

NYRCR STONY POINT

Section V
Additional Materials







Additional Materials

A. Additional Resiliency Recommendations

Table V-1
Additional Resiliency Recommendations

Project Name	Description	Estimated Costs	Regional Project
Strategy 1: Strengthen current	t short- and long-term emergency shelters and develop new sheltering opp	ortunities	
Improvements to West Main Street to increase walkability and connectivity	After Superstorm Sandy, a large number of Town residents sheltered at the Stony Point Center for up to three months. The Center, located on West Main Street in a suburban area of the Town, is somewhat distant from certain services that displaced persons need to access, including supermarkets and Town services, which are located largely along Liberty Drive/Route 9W. This project would seek to improve the connections between the Center and the cluster of services along Liberty Drive by widening West Main Street and adding street lights and sidewalks. These improvements would improve walkability and access for residents, visitors, and displaced persons traveling to shelters.	\$295,000	No
Strategy 2: Encourage econor	nic development and support existing businesses		
Improve Access to Waterfront	This project would investigate ways to improve public access to the waterfront from other areas of Stony Point, as well as access among different sections of the waterfront area. Improvements could include new/refurbished sidewalks and drainage improvements to reduce flooding. The project would also improve evacuation and emergency vehicle access to the area, while encouraging economic development and appropriate uses on the riverfront.	\$50,000 to \$100,000	No
Improve Public Transportation	In order to improve accessibility throughout the Town and facilitate evacuation in advance of serious storms, this project would provide a public transportation expansion for Stony Point. Routes would run throughout the Town along major corridors, and would focus on the waterfront with shuttle transportation in that area.	\$30,000 to \$200,000	No
Improvements to West Main Street to increase walkability and connectivity	After Superstorm Sandy, a large number of Town residents sheltered at the Stony Point Center for up to three months. The Center, located on West Main Street in a suburban area of the Town, is somewhat distant from certain services that displaced persons need to access, including supermarkets and Town services, which are located largely along Liberty Drive/Route 9W. This project would seek to improve the connections between the Center and the cluster of services along Liberty Drive by widening West Main Street and adding street lights and sidewalks. These improvements would improve walkability and access for residents, visitors, and displaced persons traveling to shelters.	\$295,000	No
Rebuild Stony Point King's Ferry Landing	The King's Ferry Landing in Stony Point, just upriver from the Stony Point Battlefield, is an important historical site in the Town as the location of one of the first river crossings in the area. Until Superstorm Sandy, a floating dock was located on the site, but wave action during that storm swept the dock away. This project would replace the floating dock that was lost, clean up debris on the site, and provide public access to what is now a fenced-off area.	\$136,000	No

Table V-1 Additional Resiliency Recommendations (Cont'd)

Project Name	Description	Estimated Costs	Regional Project
Strategy 2: Encourage econo	mic development and support existing businesses		
Reduce Residential Flood Insurance Rates	In response to the need to reduce flood insurance premiums for Stony Point residents, the Town has expressed interest in participation in the FEMA National Flood Insurance Program (NFIP) Community Rating System (CRS). This project, which the Town has already begun working on, would involve increased municipal participation in the program.	\$50,000 to \$100,000	No
Sidewalk Improvements	To facilitate pedestrian activity along major roadways in the center of the Town, this project would build and/or rehabilitate sidewalks on Holt Drive from South Liberty Drive to the Kay Fries plant, and along Crickettown Road from West Main Street to the Stony Point Center.	\$160,500	No
Town Dock / Pier	This project would involve design and construction of a new Town dock/pier on the Hudson River to provide access to the water for residents and tourists. This project would make the waterfront a more attractive place for locals and visitors alike and would be an important component of economic development along the Town waterfront.	\$1.85 million	No
Strategy 3: Improve on existing	ng emergency preparedness, response and communications		
Dam management	This project would develop a management plan that would allow for the release of water in advance of significant storm events to increase reservoirs' capacity for stormwater storage. Dams to be included in the project are those at Lake Welch, Lake Tiorati, Camp Addison Boyce, and Camp Bullowa.	\$900,000	No
Develop an Emergency Plan	This project would involve undertaking a collaborative public process to develop a Town emergency plan. Once a plan is produced, an educational campaign would ensure citizens and first responders are aware of the plan. The plan would need to provide for regular distribution of emergency information to all Town residents, in both English and Spanish.	\$35,000 to \$70,000	No
Develop an Evacuation Plan and Signage	This project would develop routes for coastal and riverine evacuation, then develop and install signage and otherwise educate the public about evacuation procedures. The project would also ensure provision of sidewalks and other means of access along the designated evacuation routes.	\$100,000 to \$200,000	No
Organize Affected Residents	Responding to a disconnect between residents and the resources they need for recovery, this project would develop an organization of affected residents to share information and best practices about recovery and resiliency. The forum would distribute information about recovery programs, connect people with information and services, and serve as a venue for residents to meet with building professionals who can provide estimates and rebuilding services. The group could participate in trainings such as Governor Cuomo's Citizen Preparedness Corps Training Program. Information would be made available in English and Spanish, and specific outreach would be made to socially vulnerable populations that have been heavily affected.	\$20,000 to \$40,000	No
Strategy 4: Provide informatio	n and assistance to homeowners with pre-storm flood-proofing and post-sto	rm repair, buyout	s and demolition
Assess the potential for alternate low income housing locations	Several of Stony Point's low income housing locations, including the Ba Mar Mobile Home Park, are located in areas of high or extreme flood risk, placing some of the Town's most vulnerable residents directly in harm's way. This project would seek to rectify this problem by studying and identifying potential opportunities that will enable residents of mobile home parks in flood risk zones to relocate to other areas of Stony Point outside of flood risk zones. This would maintain the viability of these neighborhoods, which preserve critical mixed-income and multi-generational housing for the Town.	\$75,000 to \$150,000	No
Assess Zoning Code for Rebuilding Requirements/ Processes	This project would assess the Stony Point zoning code to determine if changes to the code would be required to ease the process of rebuilding homes, other buildings, and infrastructure in the floodplain.	\$25,000 to \$50,000	No
Reduce Residential Flood Insurance Rates	In response to the need to reduce flood insurance premiums for Stony Point residents, the Town has expressed interest in participation in the FEMA National Flood Insurance Program (NFIP) Community Rating System (CRS). This project, which the Town has already begun working on, would involve increased municipal participation in the program.	\$50,000 to \$100,000	No

Table V-1 Additional Resiliency Recommendations (Cont'd)

Project Name	Description	Estimated Costs	Regional Project
Strategy 5: Promote sustai	nability and resilience through land use planning and regulation		
Assess Zoning Code for Rebuilding Requirements/ Processes	This project would assess the Stony Point zoning code to determine if changes to the code would be required to ease the process of rebuilding homes, other buildings, and infrastructure in the floodplain.	\$25,000 to \$50,000	No
Update and adopt revised Master Plan and LWRP	The Town of Stony Point's Master Plan and Local Waterfront Revitalization Program (LWRP) are in need of updates to address sustainability, energy efficiency, resilience and sea level rise. This project would initiate the public process required for updating these documents. In addition to the topics listed above, other ideas for improvements to these plans include incorporation of a Harbor Management Plan and a Marina Protection Plan to be employed during storm events.	\$125,000 to \$225,000	No
Strategy 6: Repair, rehabili	tate, upgrade and fortify critical infrastructure and transportation		
Bridge Repairs	This project would conduct a study to assess the need for repairs to bridges throughout the Town. Key bridges to be addressed include those on Lowland Hill Road and Reservoir Road, and the Penny Bridge connecting the mainland to Grassy Point. This study would be conducted by a structural engineer and would include field inspection, documentation of existing conditions and damage, and a report documenting those conditions and recommending repairs or further testing that may be required.	\$75,000 to \$120,000	No
Grassy Point Road Drainage	During Superstorm Sandy, Grassy Point Road flooded on both sides of the Penny Bridge, preventing emergency vehicle access between the mainland and Stony Point. Evacuation of residents required the use of boats. In order to eliminate/reduce the duration of roadway flooding, this project would improve stormwater management along this stretch of Grassy Point Road and/or raise the road where flooding occurs during heavy rains and there are no catch basins.	\$465,000	No
Hardening of Beach Road sewage pump station	This project would conduct an engineering study of the pump station on Beach Road to determine measures required to protect the pump station from flooding and wave action due to sea level rise and future storm events. In the short term, the project would involve installation of a floodproof door to prevent water from entering the building, floodproofing of the walls, installation of a generator with a new room to house it, and raising wall vents above flood elevation.	\$54,000	No
Hardening of Kay Fries sanitary by-pass pump station	This project would conduct an engineering study of the Kay Fries pump station to determine measures required to protect the pump station from flooding and storm surge due to sea level rise and future storm events. At a minimum, the project would require installation of a generator and waterproof electrical controls.	\$299,000 to \$339,000	No
Improve Access to Waterfront	This project would investigate ways to improve public access to the waterfront from other areas of Stony Point, as well as access among different sections of the waterfront area. Improvements could include new/refurbished sidewalks and drainage improvements to reduce flooding. The project would also improve evacuation and emergency vehicle access to the area, while encouraging economic development and appropriate uses on the riverfront.	\$50,000 to \$100,000	No
Improvements to West Main Street to increase walkability and connectivity	After Superstorm Sandy, a large number of Town residents sheltered at the Stony Point Center for up to three months. The Center, located on West Main Street in a suburban area of the Town, is somewhat distant from certain services that displaced persons need to access, including supermarkets and Town services, which are located largely along Liberty Drive/Route 9W. This project would seek to improve the connections between the Center and the cluster of services along Liberty Drive by widening West Main Street and adding street lights and sidewalks. These improvements would improve walkability and access for residents, visitors, and displaced persons traveling to shelters.	\$295,000	No
Lowland Park Flood Resilience	During Hurricane Irene and Superstorm Sandy, Lowland Park experienced significant flooding. This project would conduct a study to determine the best method to address flooding, erosion, sedimentation, streambed stability at Lowland Hill Park. The end goal would be to reconfigure the park so that equipment and structures are moved to higher ground or rebuilt to withstand flooding with minimal damage.	\$54,000	No

Table V-1 Additional Resiliency Recommendations (Cont'd)

Project Name	Description	Estimated Costs	Regional Project
Strategy 6: Repair, re	ehabilitate, upgrade and fortify critical infrastructure and transportation		
Relocate wastewater treatment plant	The Stony Point Wastewater Treatment Plant suffered approximately \$1 million in damage during Superstorm Sandy, when floodwaters entered the facility. Aside from the damages, this also increased the Town's insurance premiums dramatically, creating a long-term cost increase for Stony Point taxpayers. This project would attempt to eliminate flood risk at the wastewater treatment facility entirely by assessing options for relocating the plant to an area of the Town that lies outside of the flood zone.	\$157, 500	No
Reservoir Road Bridge Crossing / Cedar Pond Brook	Conduct a study to determine the best method for addressing flooding, erosion, sedimentation, and streambed stability at the Cedar Pond Brook crossing on Reservoir Road. This is a study only. Study includes: analysis of watershed flows to bridge; floodplain and channel survey from 200 feet upstream to falls located approximately 1500' downstream as well as the bridge and roadway geometry in the floodplain; field estimation of flow parameters; HEC-RAS analysis for flow, sediment and stability; and identification and assessment of alternatives on the basis of these analyses.	\$90,000	No
Sidewalk Improvements	To facilitate pedestrian activity along major roadways in the center of the Town, this project would build and/or rehabilitate sidewalks on Holt Drive from South Liberty Drive to the Kay Fries plant, and along Crickettown Road from West Main Street to the Stony Point Center.	\$160,500	No
Strategy 7: Harness	resiliency potential of natural resources		
Clean Up and Maintain Cedar Pond Brook and Unnamed Streams	Blockages of the Cedar Pond Brook and other waterways in Stony Point occurred during Hurricane Irene and Superstorm Sandy, causing flooding of these creeks and damage to nearby roadways and utility lines. This project would involve coordination between the Town, County, and State to develop an environmentally sensitive program to clear the channels of these streams by removing debris and detritus from approximately 1.5 miles of creek beds.	\$50,000 to \$200, 000	No
Lowland Park Flood Resilience	During Hurricane Irene and Superstorm Sandy, Lowland Park experienced significant flooding. This project would conduct a study to determine the best method to address flooding, erosion, sedimentation, streambed stability at Lowland Hill Park. The end goal would be to reconfigure the park so that equipment and structures are moved to higher ground or rebuilt to withstand flooding with minimal damage.	\$54,000	No
Oyster reef / mussels reef feasibility	This project would investigate the feasibility of and potential locations for oyster and/or mussel reefs along the Hudson River waterfront. If put in place, such reefs would provide natural storm buffers. This is a Phase I study only in which the frequency and occurrence of salinity and other environmental factors would be assessed at the potential project locations and measures would be identified and preliminarily evaluated that may provide a flood protection benefit. These measures and an analysis of their feasibility and benefit would be presented for consideration of further study and implementation.	\$45,000	No
Tidal wetland restoration north of Stony Point Bay Marina and South of Stony Point Battlefield	This project would investigate the feasibility of and potential locations for tidal wetland restoration along the Hudson River between Stony Point Bay Marina and the Stony Point Battlefield. If put in place, new or restored wetlands would provide natural buffers to flooding and wave action. This is a Phase I study only, in which wetland construction/ restoration that may provide a flood protection benefit would be evaluated. These measures and an analysis of their feasibility and benefit would be presented for consideration of further study and implementation.	\$45,000	No
Watershed Evaluation and Intervention for Stream Improvements	This project would perform a comprehensive restoration assessment of Stony Point's waterways to identify restoration goals and associated performance metrics, assess existing conditions with respect to erosion and deposition patterns, identify local and watershed-scale stressors, understand patterns of channel evolution, and determine and diagnose root-causes of observed problems (e.g. erosion problems). Based on the restoration assessment, a restoration plan would be developed, which will describe, map, and provide preliminary cost estimates for specific reach and sub-reach scale interventions required to remediate existing problems and achieve restoration goals, including but not limited to channel and floodplain redesign, bank stabilization, in-stream flow modification, bridge redesign or modification, and/or watershed restoration activities. The final step would be to develop an environmentally sensitive program with the Town, County and State to maintain these streams.	\$160,000	No

B. Master Table of Projects

Table V-2 Master Table of Projects

Project Name	Description	Category	Estimated Costs	Regional Project
Strategy 1: Strength	en current short- and long-term emergency shelters and develop new	sheltering opportuni	ties	
Improvements to West Main Street to increase walkability and connectivity	After Superstorm Sandy, a large number of Town residents sheltered at the Stony Point Center for up to three months. The Center, located on West Main Street in a suburban area of the Town, is somewhat distant from certain services that displaced persons need to access, including supermarkets and Town services, which are located largely along Liberty Drive/Route 9W. This project would seek to improve the connections between the Center and the cluster of services along Liberty Drive by widening West Main Street and adding street lights and sidewalks. These improvements would improve walkability and access for residents, visitors, and displaced persons traveling to shelters.	Additional Resiliency Recommendation	\$295,000	No
Letchworth Village Disaster Recovery and Communications Center	Set up a short-term emergency/disaster recovery center, a cooling center, and an Emergency Operations Command Center (EOCC). The RHO Building would serve as the emergency/disaster recovery center and be a central processing location for all residents in need of assistance during and after disaster events. The Police Station would serve as a flexible communications command center to accommodate a variety of emergencies, and to coordinate the activities of all emergency responders mainly through radio communications, and internet connections, in real time.	Proposed Project	\$805,000	No
Stony Point Center Retrofit	The Stony Point Center is a FEMA-approved Emergency Lodging Assistance Program site, and housed displaced residents for up to three months after Superstorm Sandy. However, the facility has experienced flooding of the main building and entry road as well as loss of power during storm events. In order to better equip the Center to support displaced residents during and after future storms, this project would install backup generators and make enhancements to the Center's stormwater management system.	Proposed Project	\$207,000	No
Update and adopt revised Master Plan and LWRP	The Town of Stony Point's Master Plan and Local Waterfront Revitalization Program (LWRP) are in need of updates to address sustainability, energy efficiency, resilience and sea level rise. This project would initiate the public process required for updating these documents. In addition to the topics listed above, other ideas for improvements to these plans include incorporation of a Harbor Management Plan and a Marina Protection Plan to be employed during storm events.	Additional Resiliency Recommendation	\$125,000 to \$225,000	No
Strategy 2: Encoura	ge economic development and support existing businesses			
Improve Access to Waterfront	This project would investigate ways to improve public access to the waterfront from other areas of Stony Point, as well as access among different sections of the waterfront area. Improvements could include new/refurbished sidewalks and drainage improvements to reduce flooding. The project would also improve evacuation and emergency vehicle access to the area, while encouraging economic development and appropriate uses on the riverfront.	Additional Resiliency Recommendation	\$50,000 to \$100,000	No
Grassy Point Development / Redevelopment	Develop a master plan for Grassy Point, which would address resiliency through methods to manage sea level rise. The plan would also seek to further public use, including tourism and education, and promote appropriate economic development and resilient water-dependent uses. The plan would consider both private and public lands on Grassy Point and present a variety of potential future uses in conceptual form.	Proposed Project	\$175,000	No
Improve Public Transportation	In order to improve accessibility throughout the Town and facilitate evacuation in advance of serious storms, this project would provide a public transportation expansion for Stony Point. Routes would run throughout the Town along major corridors, and would focus on the waterfront with shuttle transportation in that area.	Additional Resiliency Recommendation	\$30,000 to \$200,000	No

Table V-2
Master Table of Projects (Cont'd)

Project Name	Description	Category	Estimated Costs	Regional Project
Strategy 2: Encoura	ge economic development and support existing businesses			
Improvements to West Main Street to increase walkability and connectivity	After Superstorm Sandy, a large number of Town residents sheltered at the Stony Point Center for up to three months. The Center, located on West Main Street in a suburban area of the Town, is somewhat distant from certain services that displaced persons need to access, including supermarkets and Town services, which are located largely along Liberty Drive/Route 9W. This project would seek to improve the connections between the Center and the cluster of services along Liberty Drive by widening West Main Street and adding street lights and sidewalks. These improvements would improve walkability and access for residents, visitors, and displaced persons traveling to shelters.	Additional Resiliency Recommendation	\$295,000	No
Rebuild Stony Point King's Ferry Landing	The King's Ferry Landing in Stony Point, just upriver from the Stony Point Battlefield, is an important historical site in the Town as the location of one of the first river crossings in the area. Until Superstorm Sandy, a floating dock was located on the site, but wave action during that storm swept the dock away. This project would replace the floating dock that was lost, clean up debris on the site, and provide public access to what is now a fenced-off area.	Additional Resiliency Recommendation	\$136,000	No
Reduce Residential Flood Insurance Rates	In response to the need to reduce flood insurance premiums for Stony Point residents, the Town has expressed interest in participation in the FEMA National Flood Insurance Program (NFIP) Community Rating System (CRS). This project, which the Town has already begun working on, would involve increased municipal participation in the program.	Additional Resiliency Recommendation	\$50,000 to \$100,000	No
Sidewalk Improvements	To facilitate pedestrian activity along major roadways in the center of the Town, this project would build and/or rehabilitate sidewalks on Holt Drive from South Liberty Drive to the Kay Fries plant, and along Crickettown Road from West Main Street to the Stony Point Center.	Additional Resiliency Recommendation	\$160,500	No
Town Dock / Pier	This project would involve design and construction of a new Town dock/pier on the Hudson River to provide access to the water for residents and tourists. This project would make the waterfront a more attractive place for locals and visitors alike and would be an important component of economic development along the Town waterfront.	Additional Resiliency Recommendation	\$1.85 million	No
Strategy 3: Improve	on existing emergency preparedness, response and communications			
Dam management	This project would develop a management plan that would allow for the release of water in advance of significant storm events to increase reservoirs' capacity for stormwater storage. Dams to be included in the project are those at Lake Welch, Lake Tiorati, Camp Addison Boyce, and Camp Bullowa.	Additional Resiliency Recommendation	\$900,000	No
Develop an Emergency Plan	This project would involve undertaking a collaborative public process to develop a Town emergency plan. Once a plan is produced, an educational campaign would ensure citizens and first responders are aware of the plan. The plan would need to provide for regular distribution of emergency information to all Town residents, in both English and Spanish.	Additional Resiliency Recommendation	\$35,000 to \$70,000	No
Develop an Evacuation Plan and Signage	This project would develop routes for coastal and riverine evacuation, then develop and install signage and otherwise educate the public about evacuation procedures. The project would also ensure provision of sidewalks and other means of access along the designated evacuation routes.	Additional Resiliency Recommendation	\$100,000 to \$200,000	No
Letchworth Village Disaster Recovery and Communications Center	Set up a short-term emergency/disaster recovery center, a cooling center, and an Emergency Operations Command Center (EOCC). The RHO Building would serve as the emergency/disaster recovery center and be a central processing location for all residents in need of assistance during and after disaster events. The Police Station would serve as a flexible communications command center to accommodate a variety of emergencies, and to coordinate the activities of all emergency responders mainly through radio communications, and internet connections, in real time.	Proposed Project	\$805,000	No

Table V-2
Master Table of Projects (Cont'd)

Project Name	Description	Category	Estimated Costs	Regional Project
Strategy 3: Improve	on existing emergency preparedness, response and communications			
Organize Affected Residents	Responding to a disconnect between residents and the resources they need for recovery, this project would develop an organization of affected residents to share information and best practices about recovery and resiliency. The forum would distribute information about recovery programs, connect people with information and services, and serve as a venue for residents to meet with building professionals who can provide estimates and rebuilding services. Information would be made available in English and Spanish, and specific outreach would be made to socially vulnerable populations that have been heavily affected.	Additional Resiliency Recommendation	\$20,000 to \$40,000	No
Strategy 4: Provide in	nformation and assistance to homeowners with pre-storm flood-proofin	g and post-storm rep	pair, buyouts and	demolition
Assess the potential for alternate low income housing locations	Several of Stony Point's low income housing locations, including the Ba Mar Mobile Home Park, are located in areas of high or extreme flood risk, placing some of the Town's most vulnerable residents directly in harm's way. This project would seek to rectify this problem by studying and identifying potential opportunities that will enable residents of mobile home parks in flood risk zones to relocate to other areas of Stony Point outside of flood risk zones. This would maintain the viability of these neighborhoods, which preserve critical mixed-income and multi-generational housing for the Town.	Additional Resiliency Recommendation	\$75,000 to \$150,000	No
Assess Zoning Code for Rebuilding Requirements/ Processes	This project would assess the Stony Point zoning code to determine if changes to the code would be required to ease the process of rebuilding homes, other buildings, and infrastructure in the floodplain.	Additional Resiliency Recommendation	\$25,000 to \$50,000	No
Demolition of Damaged and Abandoned Structures	While many residents have rebuilt waterfront homes after they were damaged by Hurricane Irene and Superstorm Sandy, there remain a number of structures along Stony Point's Hudson River shoreline that are unimproved and boarded up. This project would acquire four such structures, all privately-owned single family homes, and demolish them in order to eliminate potential hazard and blight. These parcels would then be incorporated into the Town Park network.	Featured Project	\$1,252,000	No
Reduce Residential Flood Insurance Rates	In response to the need to reduce flood insurance premiums for Stony Point residents, the Town has expressed interest in participation in the FEMA National Flood Insurance Program (NFIP) Community Rating System (CRS). This project, which the Town has already begun working on, would involve increased municipal participation in the program.	Additional Resiliency Recommendation	\$50,000 to \$100,000	No
Strategy 5: Promote	sustainability and resilience through land use planning and regulation			
Assess Zoning Code for Rebuilding Requirements/ Processes	This project would assess the Stony Point zoning code to determine if changes to the code would be required to ease the process of rebuilding homes, other buildings, and infrastructure in the floodplain.	Additional Resiliency Recommendation	\$25,000 to \$50,000	No
Grassy Point Development / Redevelopment	Develop a master plan for Grassy Point, which would address resiliency through methods to manage sea level rise. The plan would also seek to further public use, including tourism and education, and promote appropriate economic development and resilient water-dependent uses. The plan would consider both private and public lands on Grassy Point and present a variety of potential future uses in conceptual form.	Proposed Project	\$175,000	No
Strategy 6: Repair, re	ehabilitate, upgrade and fortify critical infrastructure and transportatio	n		
Bridge Repairs	This project would conduct a study to assess the need for repairs to bridges throughout the Town. Key bridges to be addressed include those on Lowland Hill Road and Reservoir Road, and the Penny Bridge connecting the mainland to Grassy Point. This study would be conducted by a structural engineer and would include field inspection, documentation of existing conditions and damage, and a report documenting those conditions and recommending repairs or further testing that may be required.	Additional Resiliency Recommendation	\$75,000 to \$120,000	No

Table V-2 Master Table of Projects (Cont'd)

Project Name	Description Category		Estimated Costs	Regional Project
Strategy 6: Repair, re	ehabilitate, upgrade and fortify critical infrastructure and transportatio	n		
Cedar Pond Brook Interceptor Sewer Line Rehabilitation	The Cedar Pond Brook Interceptor Sewer Line is a major feeder line for the Stony Point Wastewater Treatment Plant. The line and its wood-framed support structure were undermined and exposed during Hurricane Irene, Tropical Storm Lee and Superstorm Sandy, leaving the support structure in a weakened condition due to erosion of the berm that had covered the line. This project would repair and stabilize the approximately 1/3 mile section of the sewer line that is most at risk, and provide access to enable ongoing maintenance work.	Featured Project	\$15 million	No
Grassy Point Road Drainage	During Superstorm Sandy, Grassy Point Road flooded on both sides of the Penny Bridge, preventing emergency vehicle access between the mainland and Stony Point. Evacuation of residents required the use of boats. In order to eliminate/reduce the duration of roadway flooding, this project would improve stormwater management along this stretch of Grassy Point Road and/or raise the road where flooding occurs during heavy rains and there are no catch basins.	Additional Resiliency Recommendation	\$465,000	No
Hardening of Beach Road sewage pump station	This project would conduct an engineering study of the pump station on Beach Road to determine measures required to protect the pump station from flooding and wave action due to sea level rise and future storm events. In the short term, the project would involve installation of a floodproof door to prevent water from entering the building, floodproofing of the walls, installation of a generator with a new room to house it, and raising wall vents above flood elevation.	Additional Resiliency Recommendation	\$54,000	No
Hardening of Kay Fries sanitary by-pass pump station	ening of Kay sanitary ass pump This project would conduct an engineering study of the Kay Fries pump station to determine measures required to protect the pump station from flooding and storm surge due to sea level rise and future storm Additional Resiliency Recommendation			
Hardening of Wastewater Treatment Plant	During Superstorm Sandy, the Stony Point Wastewater Treatment Plant was flooded by storm surge from the Hudson, incurring approximately \$1 million in damages. This project seeks to secure the wastewater treatment plant against future flooding through installation of enclosed/submersible motors and controls, floodproof entry doors and windows, installing new or refurbishing existing electrical systems. Also included are the engineering, design and architectural services associated with these improvements.	Proposed Project	\$1.6 million	No
Improve Access to Waterfront	This project would investigate ways to improve public access to the waterfront from other areas of Stony Point, as well as access among different sections of the waterfront area. Improvements could include new/refurbished sidewalks and drainage improvements to reduce flooding. The project would also improve evacuation and emergency vehicle access to the area, while encouraging economic development and appropriate uses on the riverfront.	Additional Resiliency Recommendation	\$50,000 to \$100,000	No
Improvements to West Main Street to increase walkability and connectivity	After Superstorm Sandy, a large number of Town residents sheltered at the Stony Point Center for up to three months. The Center, located on West Main Street in a suburban area of the Town, is somewhat distant from certain services that displaced persons need to access, including supermarkets and Town services, which are located largely along Liberty Drive/Route 9W. This project would seek to improve the connections between the Center and the cluster of services along Liberty Drive by widening West Main Street and adding street lights and sidewalks. These improvements would improve walkability and access for residents, visitors, and displaced persons traveling to shelters.	Additional Resiliency Recommendation	\$295,000	No
Lowland Park Flood Resilience	During Hurricane Irene and Superstorm Sandy, Lowland Park experienced significant flooding. This project would conduct a study to determine the best method to address flooding, erosion, sedimentation, streambed stability at Lowland Hill Park. The end goal would be to reconfigure the park so that equipment and structures are moved to higher ground or rebuilt to withstand flooding with minimal damage.	Additional Resiliency Recommendation	\$54,000	No

Table V-2 Master Table of Projects (Cont'd)

Project Name	Description	Category	Estimated Costs	Regional Project
Strategy 6: Repair, re	chabilitate, upgrade and fortify critical infrastructure and transportatio	n		
Rehabilitation of Wastewater Interceptors along Beach Road and the Ba Mar Sewer Line	This project proposes resilient construction techniques that will prevent inflow and infiltration into the sewer lines that flow into the Beach Road Pump Station and on into the Town's Wastewater Treatment Plant. This project would replace 20 manhole covers and install 20 vents to prevent storm and tidal water intrusion into the sewer lines during future flooding events and eliminate sewerage overflow along Beach Road and in the Ba Mar Mobile Home Park.	Proposed Project	\$125,000	No
Relocate wastewater treatment plant	his project proposes resilient construction techniques that will prevent inflow and infiltration into the sewer lines that flow into the Beach Road tump Station and on into the Town's Wastewater Treatment Plant. his project would replace 20 manhole covers and install 20 vents to revent storm and tidal water intrusion into the sewer lines during uture flooding events and eliminate sewerage overflow along Beach toad and in the Ba Mar Mobile Home Park. The Stony Point Wastewater Treatment Plant suffered approximately \$1 million in damage during Superstorm Sandy, when floodwaters entered he facility. Aside from the damages, this also increased the Town's surrance premiums dramatically, creating a long-term cost increase or Stony Point taxpayers. This project would attempt to eliminate flood sk at the wastewater treatment facility entirely by assessing options or relocating the plant to an area of the Town that lies outside of the cood zone. For donduct a study to determine the best method for addressing flooding, rosion, sedimentation, and streambed stability at the Cedar Pond prock crossing on Reservoir Road. This is a study only. Study includes: analysis of watershed flows to bridge; floodplain and channel urvey from 200 feet upstream to falls located approximately 1500' ownstream as well as the bridge and roadway geometry in the condplain; field estimation of flow parameters; HEC-RAS analysis for own, sediment and stability; and identification and assessment of liternatives on the basis of these analyses. The project includes half of the flooding/wave attenuation study that will be performed for the waterfront south of the battlefield park. Improvements to and/or rehabilitation of jetties and seawalls to protect resources and improve beach retention would be implemented. The esign and installation of a wave energy attenuation system is covered under this project. The project would build and/or rehabilitate sidewalks on Holt wrive from South Liberty Drive to the Kay Fries plant, and along trickettown Road fro		\$157,500	No
Reservoir Road Bridge Crossing / Cedar Pond Brook	Conduct a study to determine the best method for addressing flooding, erosion, sedimentation, and streambed stability at the Cedar Pond Brook crossing on Reservoir Road. This is a study only. Study includes: analysis of watershed flows to bridge; floodplain and channel survey from 200 feet upstream to falls located approximately 1500' downstream as well as the bridge and roadway geometry in the floodplain; field estimation of flow parameters; HEC-RAS analysis for flow, sediment and stability; and identification and assessment of alternatives on the basis of these analyses.		\$90,000	No
Shoreline Protection Against Erosion and Wave Action (Beach Road)	The project includes half of the flooding/wave attenuation study that will be performed for the waterfront south of the battlefield park. Improvements to and/or rehabilitation of seawalls and bulkheads to protect resources and improve beach retention would be implemented. The design and installation of a wave energy attenuation system is covered under this project.	Proposed Project	\$1 million	No
Shoreline Protection Against Erosion and Wave Action (River Road)	The project includes half of the flooding/wave attenuation study that will be performed for the waterfront south of the battlefield park. Improvements to and/or rehabilitation of jetties and seawalls to protect resources and improve beach retention would be implemented. The design and installation of a wave energy attenuation system is covered under this project.	Proposed Project	\$1.7 million	No
Sidewalk Improvements	To facilitate pedestrian activity along major roadways in the center of the Town, this project would build and/or rehabilitate sidewalks on Holt Drive from South Liberty Drive to the Kay Fries plant, and along Crickettown Road from West Main Street to the Stony Point Center.		\$160,500	No
Strategy 7: Harness	resiliency potential of natural resources			
Clean Up and Maintain Cedar Pond Brook and Unnamed Streams	Blockages of the Cedar Pond Brook and other waterways in Stony Point occurred during Hurricane Irene and Superstorm Sandy, causing flooding of these creeks and damage to nearby roadways and utility lines. This project would involve coordination between the Town, County, and State to develop an environmentally sensitive program to clear the channels of these streams by removing debris and detritus from approximately 1.5 miles of creek beds.	Additional Resiliency Recommendation	\$50,000 to \$200,000	No
Lowland Park Flood Resilience	During Hurricane Irene and Superstorm Sandy, Lowland Park experienced significant flooding. This project would conduct a study to determine the best method to address flooding, erosion, sedimentation, streambed stability at Lowland Hill Park. The end goal would be to reconfigure the park so that equipment and structures are moved to higher ground or rebuilt to withstand flooding with minimal damage.	Additional Resiliency Recommendation	\$54,000	No

Table V-2 Master Table of Projects (Cont'd)

Project Name	Description	Category	Estimated Costs	Regional Project
Strategy 7: Harness	resiliency potential of natural resources			
Oyster reef / mussels reef feasibility	This project would investigate the feasibility of and potential locations for oyster and/or mussel reefs along the Hudson River waterfront. If put in place, such reefs would provide natural storm buffers. This is a Phase I study only in which the frequency and occurrence of salinity and other environmental factors would be assessed at the potential project locations and measures would be identified and preliminarily evaluated that may provide a flood protection benefit. These measures and an analysis of their feasibility and benefit would be presented for consideration of further study and implementation.	Additional Resiliency Recommendation	\$45,000	No
Tidal wetland restoration north of Stony Point Bay Marina and South of Stony Point Battlefield	This project would investigate the feasibility of and potential locations for tidal wetland restoration along the Hudson River between Stony Point Bay Marina and the Stony Point Battlefield. If put in place, new or restored wetlands would provide natural buffers to flooding and wave action. This is a Phase I study only, in which wetland construction/restoration that may provide a flood protection benefit would be evaluated. These measures and an analysis of their feasibility and benefit would be presented for consideration of further study and implementation.	Additional Resiliency Recommendation	\$45,000	No
Watershed Evaluation and Intervention for Stream Improvements	This project would perform a comprehensive restoration assessment of Stony Point's waterways to identify restoration goals and associated performance metrics, assess existing conditions with respect to erosion and deposition patterns, identify local and watershed-scale stressors, understand patterns of channel evolution, and determine and diagnose root-causes of observed problems (e.g. erosion problems). Based on the restoration assessment, a restoration plan would be developed, which will describe, map, and provide preliminary cost estimates for specific reach and sub-reach scale interventions required to remediate existing problems and achieve restoration goals, including but not limited to channel and floodplain redesign, bank stabilization, in-stream flow modification, bridge redesign or modification, and/or watershed restoration activities. The final step would be to develop an environmentally sensitive program with the Town, County and State to maintain these streams.	Additional Resiliency Recommendation	\$160,000	No

C. Public Engagement Process

The public and stakeholder engagement process incorporated a range of techniques to involve Stony Point residents in shaping their NY Rising Community Reconstruction Plan:

Regular Committee Meetings

The Stony Point NYRCR Planning Committee was comprised of two co-chairs and 13 members including local business owners, elected officials, civic leaders, and storm-impacted residents. The Committee members met roughly every other week to review progress and provide input on every aspect of the plan - study area, vision, needs and opportunities, strategies, and projects. This typically took the form of group conversations, with key points and decisions recorded in meeting summaries. The Committee also had several weekend meetings to provide detailed information about assets, potential projects, to visit potential projects sites, and to deliberate on various aspects of the planning process.

Members of the Committee were instrumental in reaching out to vulnerable populations, particularly residents of the Ba Mar mobile home park, to include them in the NYRCR dialogue and encourage their attendance at Public Engagement Meetings. Committee members also distributed posters and flyers. spoke with Stony Point residents and business owners, and used social media to notify their personal networks about upcoming Public Engagement opportunities.

Four Public Engagement Meetings

Each Public Engagement Meeting was an opportunity for community members to learn about the NYRCR planning process and to provide input that informed the final elements of the plan.

Meeting #1: Vision, Assets, Needs & Opportunities

Goals for the first meeting were to familiarize community members with the NYRCR process, goals, and expected outcomes; to gather input on the draft community vision; to review and comment on the community asset list; to develop preliminary lists of community needs and opportunities; and to gather suggestions for potential projects.



Economic Development Needs & Opportunities + UTILIZE RAILROAD CORRIDOR - FREIGHT ONLY NOWUSE FOR TRANSIT - IMPACT OF CSX + PANCU SITE - NOT FULLY UTILIZED + USGYPSUMI SITE + CUPTS MARINA DEVELOPMENT (CONDO) PROPOSAL + TOURISM - LEVERAGE HARRIMAN PARK VISITORS + PROTECT/INVEST IM MARINA DISTRICT + LETCHWORTH VILLAGE - (PARTNER W/ HAVERSTRAW) + DOMNTOWN REVITALIZATION, PEDESTRIAN FRIENDLY, MORE SIDEWALKS + HOTEL - SUPPORT TOURISM BUT COULD PROVIDE HOUSING

Residents in conversation with Committee member Rebecca Casscles at Public Engagement Meeting #1. In the foreground are maps of economic development and housing needs and opportunities along with pens for community members to add items to the map. In the background are posters where Committee and Consultant Team members recorded needs and opportunities suggested by residents. These were added to the master list of needs and opportunities in initial drafts of the NYRCR Plan.

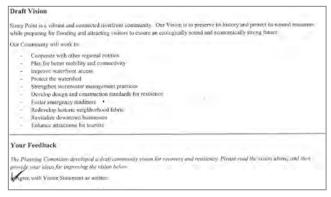
This was accomplished through a presentation that gave an introduction to the NY Rising program and process, provided an overview of the project timeline, and reported on the progress to date. This informational presentation was followed by an open-house-style community break-out session during which community members provided input on the draft community vision, added to the list of community assets, fleshed out a preliminary list of needs and opportunities, and contributed project ideas.

For each topic, residents visited stations set up around the room to have conversations, provide their feedback, and contribute ideas:





At another station, residents were invited to view the draft asset map and add post-it notes recording additional assets. While many of the assets added by residents were actually needs or opportunities, the information was invaluable in fleshing out the initial sections of the plan. Among the assets identified were the Hudson River, local elementary schools, the waterfront, Letchworth Village, and the Palisades Parkway.



Residents were also offered worksheets with the draft vision statement and asked to indicate whether they agreed with the draft statement or had edits.

At each Public Engagement Meeting, additional information was available about the Committee's activities to date, Committee meeting summaries, the NY Rising Program (including how to become and stay involved), and other related recovery efforts.

Meeting #2: Conceptual Plan & Preliminary Project Assessment

The primary goals for the second NY Rising Public Engagement Meeting were to:

- Present the Conceptual Plan;
- Open dialogue with the community to foster understanding and build support for the NYRCR Plan;
- Engage with and listen to members of the public who have firsthand knowledge of Stony Point and the issues being addressed in the NYRCR planning process;
- Identify reconstruction strategies to help shape the NYRCR Plan;
- Promote community understanding of storm risks, the NYRCR Plan, and management measures; and
- Forecast next steps of the NYRCR process.

Residents were welcomed to the meeting and then given a brief presentation about the NYRCR program, the Conceptual Plan, and the concept of resiliency. They then participated in small group discussions in which they applied the vision from the Conceptual Plan and their group's definition of resiliency to assess

the list of potential projects drafted by the Committee and Consulting Team. Everyone at the table was given an opportunity to explain their point of view and provide suggestions.

Throughout the meeting, a representative of the NY Rising Housing Recovery Program was on hand to provide information about that program and to assist homeowners interested in applying for funding. The NY Rising Housing Recovery Program is operated by the Governor's Office of Storm Recovery (GOSR) and facilitates home repairs, rehabilitation, mitigation, and elevation for the owners of single-family homes.





Small group discussions in progress. Residents reported that they appreciated the opportunity to discuss the planning work in progress, but even more so, the chance to connect with other Stony Point residents.

At the close of the session, representatives from each table summarized their group discussions for the rest of the attendees. This meaningful public comment helped set the groundwork for the Committee's next



round of reviewing project ideas and priorities. Key resiliency related themes from the report back included upgrading emergency shelters, improving pedestrian access to the waterfront and throughout the Town, addressing flooding/access issues along the waterfront, and educating the public before, during and after the storm. An example of the report back input is presented in the following figure.

Meeting #3: Project Categorization

Goals for the third Public Engagement Meeting included:

- ▶ Familiarizing the community with the Risk Assessment Tool (and with the metrics for evaluating Costs/ Benefits if available);
- Promoting community understanding of storm risks, the NYRCR Plan, and management measures;
- Presenting proposed projects and assessing community support for these projects;
- Gathering feedback and detailed local knowledge about projects in order to inform categorization; and
- Informing the public that the proposed project list would be further evaluated by the State to confirm funding eligibility.

This Public Engagement Meeting began with a brief overview presentation providing background about the NYRCR Program and process and briefly summarized the projects that had risen to the top of the draft Stony Point NYRCR Plan. After the presentation, residents again transitioned into an open-house format to visit posters about each of the proposed and other projects. Residents were given "passports" – a packet of worksheets with questions and rating opportunities for each of the listed projects, as well as space for additional questions and feedback about the project.





Attendees visited project posters with the "passports," learning about the potential projects and providing written feedback. Committee and Consultant Team members were available to answer questions about the projects

Passport comments were an important component of Stony Point's final project categorization. As indicated in the table below, community members present at the third Public Engagement Meeting supported the Proposed and Featured Projects identified by the Committee.

Table V-3 Community Support for Projects Voiced at Third Public Engagement Meeting

Project	Community Support
Letchworth Village Utilization (Emergency and Operations Communications Center)	Medium - General support, but some issues to resolve
Stony Point Center Retrofit	Medium - General support, but some issues to resolve
Shoreline Protection (Protect Against Erosion and Wave Action - Beach Road)	High - Strong support with consensus to move forward
Shoreline Protection (Protect Against Erosion and Wave Action - River Road)	High - Strong support with consensus to move forward
Rehabilitation of Wastewater Interceptors (Beach Road and Ba Mar Sewer Line)	Medium - General support, but some issues to resolve
Wastewater Treatment Plant Hardening	Medium - General support, but some issues to resolve
Grassy Point Redevelopment	Medium - General support, but some issues to resolve
Interceptor Sewer Line Rehabilitation (Cedar Pond Brook)	Medium - General support, but some issues to resolve
Demolition of Damaged/Abandoned Structures	Medium - General support, but some issues to resolve
Update Revised Master Plan and LWRP	Medium - General support, but some issues to resolve
Alternate Low Income Housing Locations	Medium - General support, but some issues to resolve
Marina Protection	Medium - General support, but some issues to resolve
Rebuild Stony Point King's Ferry Landing	Minimal - Action is not presently supported, but bears additional study and evaluation
Improve Access to Waterfront	Medium - General support, but some issues to resolve
Dam Management	Medium - General support, but some issues to resolve
Improvements to West Main Street (Increase Walkability and Connectivity)	Medium - General support, but some issues to resolve
Sidewalk Improvements	Medium - General support, but some issues to resolve
Hardening of Kay Fries Pump Station	Medium - General support, but some issues to resolve
Hardening of Beach Road Pump Station	Medium - General support, but some issues to resolve
Clean Up and Maintain Cedar Pond Brook	Medium - General support, but some issues to resolve
Lowland Park Flood Resilience	Medium - General support, but some issues to resolve
Oyster Reef / Mussel Reef Feasibility	Minimal - Action is not presently supported, but bears additional study and evaluation
Tidal Wetland Restoration	Medium - General support, but some issues to resolve
Assess Zoning Code (Rebuilding Requirements/Processes)	Medium - General support, but some issues to resolve
Organize Home and Business Owners	Medium - General support, but some issues to resolve
Develop an Emergency Plan	High - Strong support with consensus to move forward
Develop an Evacuation Plan and Signage	Medium - General support, but some issues to resolve
Grassy Point Road Drainage	Medium - General support, but some issues to resolve
Relocate Wastewater Treatment Plant	Medium - General support, but some issues to resolve
Improve Public Transportation	Medium - General support, but some issues to resolve
Bridge Repairs	Medium - General support, but some issues to resolve
Reservoir Road Bridge Crossing	Medium - General support, but some issues to resolve
Watershed Evaluation and Intervention (Stream Improvements)	Minimal - Action is not presently supported, but bears additional study and evaluation
Town Dock/Pier	Medium - General support, but some issues to resolve
Reduce Residential Flood Insurance Rates	Medium - General support, but some issues to resolve

The Committee, in turn, had developed these projects taking into account the input from the Community at the second Public Engagement Meeting.

Similar to Meeting #2, Meeting #3 closed with residents reporting back their ideas on a series of

Which project(s), if implemented, will help the community recover from the next storm?

- -Letchworth Village would deal well with recovery after a storm; people need access to information from their homes. Local radio 2-way communication
- -Stony Point Center has already proven its value as a recovery center, and people already know it from other events during the year. Will provide confidence in the Center's ability as a recovery center

-



Which project(s), if implemented, do you think provides the co-benefit of economic development?

- Beach Road revitalization area is constantly undermined; road needs to be raised.
 Improvement is key to redeveloping the waterfront and attracting tourists. Improving access is also important.
- Lowering insurance rates must ensure people can afford to live in Stony Point
- Grassy Point would increase housing values in the area

Which project(s), if implemented, do you think has the potential to make a regional impact?

- Economic development plan through waterfront infrastructure/access – would draw people from throughout the region
- Revise master plan/LWRP needs to be revised and would contribute to this (use grants from other sources)
- Protect natural environment hardening wasewater treatment plant, Cedar Pond Brook
- Development too close to the creek Town should reexamine its floodplain development policies; FEMA and County stream maps need to be revised
- Stony Point Battlefield draws people here need to preserve its setting including the Hudson River

questions. The Committee invited attendees to share their thoughts on which projects would make Stony Point more resilient, benefit economic development, best support vulnerable populations, have regional impact, and improve resiliency for low/moderate income residents. The responses informed the final project categorization and are as follows:

Which project(s), if implemented, addresses improved resiliency for low/moderate income residents?

- Improve public transit routes & Improve access to waterfront – makes it easier for both locals and tourists to get around Town
- Alternate housing locations need a plan for Ba Mar residents. Very unclear future at this time.
- Stony Point Center brought stability to people's lives after the storm
- Organize home and business owners good way to disseminate information to low and moderate income folks
- Reduce insurance rates



Which project(s), if implemented, addresses improved resiliency for other socially vulnerable populations including the elderly, young children and people with disabilities?

- Letchworth Village Need a bigger emergency response center. Could sort out people's needs more effectively. Bring all emergency services under one roof so they can coordinate.
- Better communication need to know where to get services without going out into Town. Call-in radio program. Could help get information on where services are available for those who need them. Could expand existing radio service.
 Distribute radios to every household in Town.
- Education in advance of a disaster re: where services are available



Meeting #4: Implementing the NYRCR Plan

A fourth Public Engagement Meeting will be held to discuss implementation goals and initial plans with Stony Point residents and business owners, and will include a presentation summarizing the final plan and a discussion around the implementation strategy and action plan. While this meeting will be after the official submittal of the NYRCR Plan, it will be an important opportunity for community members to discuss its benefits and the projects within it.

D. Community Asset Inventory

Table V-4	Stony Point Coastal Community Assets
Table V-5	Stony Point Riverine Community Assets
Figure V-1	Landscape Attribute Determination Worksheet Completed Example
Figure V-2	Vulnerability Score Determination Worksheet Completed Example

Table V-4 **Stony Point Coastal Community Assets**

Map Asset #	Asset Name	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Risk Area	Erosion Rate ≥1 foot per year or unknown	Waterline frequently at shore defense or upland vegetation	Lack of Shore Defenses	Lack of Protective Vegetation	Dunes Absent	On Barrier Island or Filled Wetland	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
1	Patsy's Bay Marina I and II	Economic	Marina/Water Based Business	Yes	No	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	4	54
2	Stony Point Bay Marina	Economic	Marina/Water Based Business	Yes	No	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	4	54
3	Vincent A. Clark Riverview Park & Kayak Access	Natural and Cultural Resources	Parks and Recreation	Yes	No	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	2	27
4	Minisceongo Yacht Club/Marina	Economic	Small Business	Yes	No	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	4	54
5	Access to Grassy Point Road Bridge (Penny Bridge)	Infrastructure Systems	Transportation	Yes	No, Locally Significant	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	2	27
6	River Front Park	Natural and Cultural Resources	Parks and Recreation	Yes	No	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	2	27
7	Gilligan's on the Hudson	Economic	Restaurants	Yes	No	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	4	54
8	Ba Mar Mobile Home Park	Housing	Single-Family Residence	Yes	No	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	5	68
12	Kings Ferry Landing/State-owned houses	Natural and Cultural Resources	Historic Landmarks and Facilities	No		Low												
14	Beach Road Sewage Pump Station	Infrastructur e Systems	Wastewater	No	Yes, FEMA	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
16	Wastewater Treatment Plant	Infrastructur e Systems	Wastewater	Yes	Yes, FEMA	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	2	27
17	PANCO site	Economic	Small Business	Yes	No	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	4	54
22	US Gypsum Manufacturing facility	Economic	Large Business	Yes	No	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	1	14
26	US Gypsum Water Tower	Infrastructur e Systems	Large Business	No	No	Medium	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
28	Grassy Point Road	Infrastructur e Systems	Transportation	Yes	No, Locally Significant	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	2	27
29	River Road	Infrastructur e Systems	Transportation	Yes	No, Locally Significant	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	2	27
30	Jones Point	Housing	Multi-Family Residence	Yes	No	High	Extreme	No	No	Yes	Yes	Yes	Yes	2	3	4	4	48
31	770 N. Liberty Drive RT & other RT9W houses	Housing	Single-Family Residence	Yes	No	High	Extreme	No	No	Yes	Yes	Yes	Yes	2	3	4	3	36
32	Seaweed Yacht Club	Economic	Small Business	Yes	No	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	4	54
33	CSX	Infrastructur e Systems	Transportation	Yes	No	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	2	27
34	TZ Marine Services	Economic	Small Business		No	Medium	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	4	54
35	WH Kassner	Economic	Small Business		No	Medium	Extreme	No	No	Yes	Yes	Yes	Yes	2	3	4	3	36
36	River Road (Housing)	Housing	Single-Family Residence	Yes	No	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	4	54
37	Grassy Point Road (Housing)	Housing	Single-Family Residence	Yes	No	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	4	54
38	Beach Road (Housing)	Housing	Single-Family Residence	Yes	No	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	5	68
40	Kay Fries Sanitary By- Pass Pump Station	Infrastructur e Systems	Wastewater	No	Yes, FEMA	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
43	Beach Road	Infrastructur e Systems	Transportation	Yes	No, Locally Significant	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	2	27
46	Beach Road Interceptor Sewer	Infrastructur e Systems	Wastewater	No	Yes, FEMA	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
47	Surfside 3 at Penny Bridge Marina	Economic	Marina/Water Based Business	Yes	No	High	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	4	54
52	Kayak access point - Haverstraw	Natural and Cultural Resources	Parks and Recreation	No	No	Low	Extreme	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	2	27
	Bridge - CSX tracks at Stony Point Bay Marina	Infrastructur e	Transportation	No		Medium												

Table V-4 Stony Point Coastal Community Assets (Cont'd)

Map Asset #	Asset Name	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Risk Area	Erosion Rate ≥1 foot per year or unknown	Waterline frequently at shore defense or upland vegetation	Lack of Shore Defenses	Lack of Protective Vegetation	Dunes Absent	On Barrier Island or Filled Wetland	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
	Bridge - CSX tracks at Tomkins Ave	Infrastructur e	Transportation	No		High												
	Bridge - E Main Street at CSX tracks	Infrastructur e	Transportation	No		High												
	County Seawalls/Jetties	Infrastructur e Systems	Stormwater	Yes	Yes, FEMA	High												
	Iona Island	Natural and Cultural Resources	Parks and Recreation	Yes	Yes, FEMA	High												
	Kings Ferry Landing	Natural and Cultural Resources	Historic Landmarks and Facilities	No	No	High	Extreme	No	Yes	Yes	No	No	No	1	3	3	1	9
	Land mass on Grassy Point	Economic		No		High												
	Lovett Generating Station	Economic	Single-Family Residence	Yes	Yes, FEMA	High												
	Stony Point Battlefield Park & Lighthouse	Natural and Cultural Resources	Historic Landmarks and Facilities	No		High												
	The Hudson River	Natural and Cultural Resources	Water Bodies	Yes	Yes, FEMA	High												
	TILCON quarry	Economic	Large Business	Yes	Yes, FEMA	High												
	Turning Point Church	Natural and Cultural Resources	Cultural or Religious Establishments	No		Medium												
	Vacant lands along Hudson	Economic		No		High												
	Waldron Cemetery	Natural and Cultural Resources	Historic Landmarks and Facilities	No		High												

Table V-5 **Stony Point Riverine Community Assets**

Map Asset #	Asset Name	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Risk Area	Lack of Defensive Flood Protection Measures	Elevation Below BFE	Occupied <_ 2ft above BFE	At Confluence of 2 or More Streams	Flood Risk from Stormwater	Lack of Vegetated Stream Bank Buffer	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
9	Stony Point Center	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High	High		No	No	Yes	Yes	No	1.5	3.00	2.5	2	15
10		Natural and Cultural Resources	Parks and Recreation	Yes	No	High	Extreme	Yes	Yes	Yes	No	No	Yes	2	3	4	3	36
11	Four houses on	Housing	Single-Family Residence	Yes	No	Medium	Moderate	Yes	Yes	Yes	No	No	Yes	2	3	2.5	3	23
15	Letchworth Village/RHO	Health and Social Services	Emergency Operations/Response	Yes		High												
18	Pov Socut Comp	Natural and Cultural Resources	Parks and Recreation	Yes	No	High	Extreme	Yes	Yes	Yes	Yes	No	Yes	2.5	3	4.5	2	27
19	Camp Addison Boyce - Girl Scout	Natural and Cultural Resources	Natural Habitats	Yes	No	High	Extreme	Yes	No	No	Yes	No	No	1	3	3	2	18
20		Health and Social Services	Emergency Operations/Response	No		High												
21	North Rockland soccer fields	Natural and Cultural Resources	Parks and Recreation	No	No	Medium	Extreme	No	No	No	Yes	Yes	No	1	3	3	2	18
23	Rockland Food Pantry	Health and Social Services	Public Works Facilities	Yes		Medium												
24	Central Dr (Rte 210)/Gate Hill Rd and Bridges	Infrastructure Systems	Transportation	No	No	High	High	Yes	Yes	Yes	Yes	No	Yes	2.5	3	3.5	2	21
25	Willow Grove Road near entrance to PIP	Infrastructure Systems	Transportation	No	No	High	Extreme	Yes	Yes	Yes	Yes	No	No	2	3	4	2	24
27	Stony Point Police Department	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High												
39	Cedar Flats Mobile Home Park	Housing	Affordable Housing	Yes	No	High	Extreme	Yes	No	No	Yes	No	No	1	3	3	2	18
41	Cedar Flats Road	Infrastructure Systems	Transportation	Yes	No	High	Extreme	Yes	No	No	Yes	No	No	1	3	3	2	18
42	Reservoir Road and Bridge	Infrastructure Systems	Transportation	Yes	No	High	Extreme	Yes	Yes	Yes	Yes	No	Yes	2.5	3	4.5	2	27
44		Infrastructure Systems	Transportation	No	No	Medium	Extreme	Yes	Yes	Yes	No	No	Yes	2	3	4	2	24
45	Town Hall	Health and Social Services	Government and Administrative Services	No		High												
48	Laurel Drive Park	Natural and Cultural Resources	Parks and Recreation	No	No	Medium	Moderate	Yes	No	No	Yes	No	No	1	3	1.5	1	5
49		Natural and Cultural Resources	Libraries	Yes		High												
30		Health and Social Services	Emergency Operations/Response	No		High												
51	Stony Point Town Garage	Infrastructure	Transportation	No	No	High												
53	Cedar Pond Brook	Infrastructure Systems	Wastewater	No	Yes, FEMA	High	Extreme	Yes	Yes	Yes	Yes	No	Yes	2.5	3	4.5	3	41
		Economic	Grocery/Food Suppliers	No		Medium												

Table V-5 Stony Point Riverine Community Assets (Cont'd)

,	oint Riverine Con	1	l (Contra)								•							
Map Asset #	Asset Name	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Risk Area	Lack of Defensive Flood Protection Measures	Elevation Below BFE	Occupied <_ 2ft above BFE		Flood Risk from Stormwater	Lack of Vegetated Stream Bank Buffer	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
	Ambrey Pond	Natural and Cultural Resources	Water Bodies	No		High												
	Appalachian Trail	Economic	Parks and Recreation	No		Low												
	Bear Mountain Inn	Economic	Tourism Destination	No		Medium												
	State Park	Natural and Cultural Resources	Parks and Recreation	No		Medium												
	Bridge - Battlefield Road/CSX Tracks	Infrastructure	Transportation	No		High												
	Bridge - South Liberty Drive	Infrastructure	Transportation	No		High												
	Camp Venture	Natural and Cultural Resources	Parks and Recreation	No		High												
	Cedar Pond Brook/Cedar Pond	Natural and Cultural Resources	Water Bodies	Yes	Yes, FEMA	High												
	Children of America	Health and	Public Works Facilities	Yes		Medium												
	Children of Mary, Marian Shrine	Natural and Cultural Resources	Cultural or Religious Establishments	No		Medium												
	Crickettown Nursery School		Schools	Yes		Medium												
	Cross Roads	Economic	Grocery/Food Suppliers	No		Medium												
	CVS Pharmacy	Health and Social Services		No		Medium												
	Elm Avenue at	Infrastructure	Transportation	No		Medium												
		Natural and Cultural Resources	Natural Habitats	No		High												
	Gilmore Sloan House	Natural and Cultural Resources	Cultural or Religious Establishments	No	No	Medium												
	Good Samaritan	Health and Social Services	Healthcare Facilities	Yes		Medium												
	Harriman State Park	Natural and	Parks and Recreation	No		Medium												
	Helen Hayes Hospital (rehabilitation only)	Health and Social Services	Primary/Regional Hospitals	No		Medium												
		Economic	Grocery/Food Suppliers	No		Medium												
	Immaculate Conception School	Health and Social Services	Schools	Yes		Medium												
		Health and Social Services	Schools	Yes	Yes, FEMA	High												
	Jessup Stream	Natural and Cultural Resources	Water Bodies	Yes	Yes, FEMA	High												
	Keller Army Community Hospital at West Point	Health and Social Services	Primary/Regional Hospitals	No		Low												

Table V-5 Stony Point Riverine Community Assets (Cont'd)

Map Asset #	Asset Name	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Risk Area	Lack of Defensive Flood Protection Measures	Elevation Below BFE	Occupied <_ 2ft above BFE	Flood Risk from Stormwater	Lack of Vegetated Stream Bank Buffer	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
	Knights Corner	Health and Social Services	Schools	Yes		Medium											
	Liberty Drive/Route 9W Corridor	Housing	Senior Housing	Yes		Medium											
	Liberty Ridge Senior Housing	Housing	Senior Housing	Yes		Medium											
	Mountain View Mobile Home Park	Housing	Affordable Housing	Yes		Medium											
	New York State Garage	Infrastructure Systems	Transportation	No		High											
	North Rockland High School	Health and Social Services	Schools	Yes		High											
	Nyack Hospital	Health and Social Services	Primary/Regional Hospitals	No		Medium											
	O&R Substation Palisades Interstate	Infrastructure	Power Supply	No		High											
	Park	Infrastructure Systems	Parks and Recreation	No		Medium											
	Patriot Hills Golf Course	Economic	Large Business	No		Medium											
	Penguin Repertory Theater	Natural and Cultural Resources	Cultural or Religious Establishments	No		High											
	Pyngyp School	Health and Social Services	Schools	Yes		Medium											
	Rite-Aide	Health and Social Services	Healthcare Facilities	No		Medium											
	Rockland Animal Shelter	Health and Social Services	Public Works Facilities	No		Low											
	Rockland County Highway Department	Infrastructure Systems	Transportation	No		High											
	Rockland Mobile Care	Health and Social Services	Healthcare Facilities	Yes		Medium											
	Septra/Algonquin Gas	Infrastructure Systems	Liquid Fuels	Yes		High											
	Shop Rite	Economic	Grocery/Food Suppliers	No		Medium											
	Sopko Apartments (Stony Point elderly apartments)	Housing	Senior Housing	Yes		High											
	Stony Point Elementary School	Health and Social Services	Schools	Yes		High											
	Stony Point Gas Stations	Infrastructure Systems	Liquid Fuels	No		Medium											
	Stony Point Industrial Park	Economic	Industrial, Warehousing and Manufacturing	No		Medium											
	Stony Point Motel	Economic	Lodging	No		Low											
	Stony Point Pharmacy	Health and Social Services	Healthcare Facilities	No		Medium											
	Stony Point Pool	Natural and Cultural Resources	Parks and Recreation	No		Medium											

Table V-5 Stony Point Riverine Community Assets (Cont'd)

Map Asset #	Asset Name	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Risk Area	Lack of Defensive Flood Protection Measures	Elevation Below BFE	Occupied <_ 2ft above BFE	At Confluence of 2 or More Streams	Flood Risk from Stormwater	Lack of Vegetated Stream Bank Buffer	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
	Teddy Bear Nursery	Health and Social Services	Schools	Yes		Medium												
	Thamsen Mobile Home Park	Housing	Affordable Housing	Yes		High												
	Timp Brook	Natural and Cultural Resources	Water Bodies	Yes														
	Tiorati Brook	Natural and Cultural Resources	Water Bodies	Yes	Yes, FEMA	High												
	Unnamed Stream empties into wetlands at Battlefield	Natural and Cultural Resources	Water Bodies	Yes	Yes, FEMA	High												
	US Gypsum Pump House	Infrastructure Systems	Wastewater	No		Medium												
	US Post Office - Stony Point	Health and Social Services	Government and Administrative Services	No		High												
	US Post Office - Tomkins Cove	Health and Social Services	Government and Administrative Services	No		High												
	Veteran's Memorial baseball park	Natural and Cultural Resources	Parks and Recreation	No		Medium												
	Waldron Spring	Natural and Cultural Resources	Natural Habitats	No		High												
	Walgreens	Health and Social Services	Healthcare Facilities	No		Medium												
	West Point Military Academy	Economic	Tourism Destination	No		Medium								_				
	Wetlands along the Hudson River and within Battlefield Park	Natural and Cultural Resources	Wetlands and marshes	Yes	Yes, FEMA	High												

Figure V-1
Landscape Attribute Determination
Worksheet Completed Example

attribute:	Erosion Rate						
Asset:	Ba Mar Mobil	e Home	Asset ID:	15 Address:	400 Ba Mar Dr	Stony Point, NY 109	36
Determina	tion:		Long-term average	erosion rate is	1 foot or more p	er year (YES)	
		✓	Long-term average	erosion rate is	less than 1 foot	per year (NO)	
			Long-term average	erosion rate is	unknown (YES)		

Determination methodology:

- 1) Refer to Coastal Erosion Hazard Area (CEHA) map for the asset's location. If the asset is within a Structural Hazard Area, the long-term average erosion rate is greater than or equal to 1 foot or more per year.
- 2) If a CEHA map is not available for the asset location, compare successive years of aerial photographs to determine whether there is observable shoreline recession. If possible, calculate erosion rate based on demonstrated shoreline recession.
- 3) If methods 1 and 2 are not feasible for the asset location, assume erosion is 1 foot per year or greater for all ocean and Long Island Sound coast lines, but not within bays.

Justification: Coastal Erosion Hazard Area maps do not exist for Rockland County. Because the county

is not located on an ocean or Long Island sound coast line, the long-term average

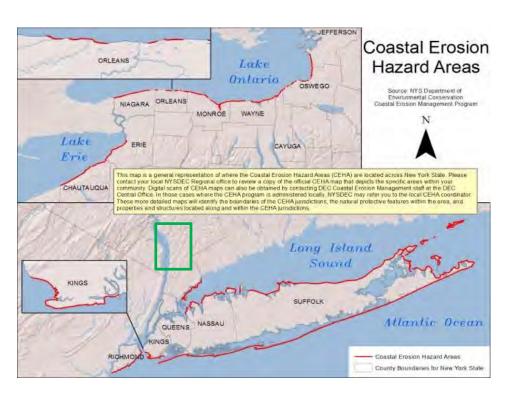
erosion rate is assumed to be less than one foot per year.

Data gaps/questions: None.

Aerial photograph:

Legend

Asset



Attribute: Beach Width

Asset: Ba Mar Mobile Home Asset ID: 15 Address: 400 Ba Mar Dr Stony Point, NY 1098

Determination: Water line is frequently or daily in contact with shore defense structure or upland vegetation (YES)

Water line is not frequently or daily in contact with shore defense structure or upland vegetation (NO)

Determination methodology:

- 1) Determine, using aerial photographs or site visits, whether shore defense structures or upland vegetation are present. Then, determine base elevation of shore defense structure or upland vegetation using relevant LiDAR GIS map. Mean higher high water level (MHHW) for Stony Point is 2.03 ft (NAVD88) (obtained from http://www.ngs.noaa.gov/Tidal_Elevation/). If MHHW is greater than or equal to the base elevation of the defense structure or upland vegetation, answer "YES."
- 2) If tidal elevation or shore structure elevation data are not available, consult aerial photography or observe in field whether the water line is in frequent or daily contact with shore defense structures or vegetation.

Justification: Minimum ground elevations at shore defense structure are approximately 0-2 feet

(NAVD88), and MHHW for the shoreline is 2.03 ft (NGVD88).

Data gaps/questions: None.

Aerial photograph:



Attribute: Shore Defenses

Asset: Ba Mar Mobile Home Asset ID: 15 Address: 400 Ba Mar Dr Stony Point, NY 1098

Determination: Shore defenses are absent, not constructed to anticipated storm or sea level rise conditions, or are deteriorating (YES)

Shore defenses are present, constructed to anticipated storm or sea level rise

conditions, and in good condition (NO)

Determination methodology:

- Conduct a site visit or use aerial and street-level imagery to determine whether shore defense structures are present. If present, observe condition of shore defenses in the vicinity of the asset, including sea walls, bulkheads, and levees. If in good condition, observe structure height relative to ground elevation.
- 2) Compare structure height to anticipated flood levels (available from FEMA Flood Insurance Rate Maps, http://fema.maps.arcgis.com/home/webmap/viewer.html?webmap=2f0a884bfb434d76 af8c15c26541a545&extent=-3.99491620295004,41.2261073109 551,-73.9912737631073,41.22711596758084) and sea level rise projections (http://www.geoplatform.noaa.gov/home/webmap/viewer.html?webmap=3097fc32e98f490cbacc54057519 38e9).
- If direct observation is not feasible, interview local residents, experts, and/or authorities for information regarding shore defense structures.

Justification: A site visit indicated that shore defense structures are present on the nearest shoreline,

but the seawall stops at ground elevation, which is roughly 0-2 feet (NAVD88). FEMA

maps indicate a BFE of 12 ft (NAVD88) for a 100 year storm in this area.

Data gaps/questions: None.

FEMA Best Available Flood Hazard Maps (2013)



J. Reed (Image Date: 11/20/13)



Ba Mar Homes Shoreline

Attribute: Vegetation

Asset: Ba Mar Mobile Home Asset ID: 15 Address: 400 Ba Mar Dr Stony Point, NY 1098

Determination: Protective vegetation, wetlands, or intervening structures between asset and

flood source are absent (YES)

Protective vegetation, wetlands, or intervening structures between asset and

flood source are present (NO)

Determination methodology:

1) Locate the asset on the Preliminary Coastal Hazards Composite Risk Map (http://www.arcgis.com/home/webmap /viewer.html?webmap=82a2fa929168434dabb6a3970e1d38e0). Add the USGS Land Cover NLCD_2006 layer. Determine if there are wetlands or at least 300 feet of shrubbery, dense vegetation, or forested land between the asset and the flood source. Confirm presence or absence of vegetation by observing aerial imagery of the location or by conducting a site visit.

2) If the land cover map is unavailable for the asset location, or if the information provided in the map is inconclusive, verify presence or absence of protective vegetation through on-site observations.

Justification: USGS land cover maps show the asset with low-high density development located at the

edge of the flood source.

Data gaps/questions: None.

Legend Asset USGS Land Cover NLCD_2006 Land Cover 2006 Open Water Perennial Ice/Si Developed, Open Space Developed, Low Intensity Developed, Medium Intensity Developed, High Intensity Barren Land (Rock/Sand/Clay) Consolidated Shore Deciduous Forest Evergreen Forest **Mixed Forest** Shrub/Scrub Grasslands/Herbaceous Pasture/Hay Cultivated Crops Woody Wetlands Emergent Herbaceous Wetlands



USGS Land Cover Map 2006

http://www.arcgis.com/home/webma p/viewer.html?webmap=82a2fa92916 8434dabb6a3970e1d38e0

Attribute: Dunes or Bluffs

Asset: Ba Mar Mobile Home Asset ID: 15 Address: 400 Ba Mar Dr Stony Point, NY 1098

Determination: Unless are absent, below BFE, or eroding (scarped), discontinuous, or have little vegetation. Bluff slopes are unstable, partially vegetated. (YES)

Dunes are present, above BFE, not eroding (scarped) or discontinuous, and have adequate vegetation. Bluff slopes are stable and adequately vegetated.

(NO)

Determination methodology:

- Conduct a site visit to determine presence of dunes or bluffs. If present, observe condition of dunes or bluffs. If in good condition, determine height of dunes relative to the base ground elevation.
- 2) Determine the base ground elevation of the location using the relevant LiDAR GIS elevation maps. Then add the dune height to the ground elevations, and compare to the base flood elevation (BFE) found on the appropriate FEMA Flood Insurance Rate Map (FIRM) (http://fema.maps.arcgis.com/home/webmap/viewer. html?webmap=2f0a884bfb434d76af8c15c26541a545&extent=-73.99491620295004,41.2261073109551,-73.9912737631073,41.22711596758084).

Justification: Site visits indicated that dunes and bluffs are not present in this area.

Data gaps/questions: None.

J. Reed (Image Date: 11/20/13)



Attribute: Soils

Asset: Ba Mar Mobile Home Asset ID: 15 Address: 400 Ba Mar Dr Stony Point, NY 1098

Determination: Asset is located on a coastal barrier island or filled wetland (YES)

Asset is not located on a coastal barrier island or filled wetland (NO)

Determination methodology:

- Locate the asset location on the FWS Wetlands Mapper (http://www.fws.gov/wetlands/Wetlands-Mapper.html). Identify whether the asset location coincides with a historical wetland or is on a coastal barrier island, or is located on an area of historic open water. Confirm through use of historical imagery (Google Earth or Sanborn maps).
- If wetland mapping data is unavailable for the asset location, verify through on-site observations or interviews with local residents, experts, and/or authorities.

Justification: The asset is located in very close proximity to wetlands/open water, as seen in the FWS

wetland mapping tool. It is possible that this area is built on a filled wetland, but no historical data is available to determine conclusively. Assumed historic wetland to make

conservative assessment.

Data gaps/questions: Historical wetland data unavailable.

Aerial photograph:





Attribute: Defensive Flood Protection Measures

Asset: Area 6B Asset ID: 55, 85 Address: Lowland Hill Rd.

condition, or lack maintenance commitment (YES)

Defensive flood protection measures are present, above BFE, in good

condition, and have maintenance commitment (NO)

Determination methodology:

- 1) Conduct a site visit to observe presence, condition, and height of flood protection measures in the vicinity of the asset. Compare structure height to BFE levels (available from FEMA Flood Insurance Rate Maps (FIRM), http://fema.maps.arcgis.com/home/webmap/viewer.html?webmap=2f0a884bfb434d76af8c15c26541a545&extent=-73.99491620295004,41.2261073109551,-73.9912737631073,41.22711596758084). Determine base ground elevation using LiDAR GIS elevation maps.
- 2) If direct observation is not feasible, interview local residents, experts and/or authorities for information regarding defensive flood protection measures.

Justification: No defensive flood protection measures are in place, as seen in site photos

below.

Data gaps/questions: None

Aerial photograph:

Legend

Asset

Site Photos take by J. Dellaria 11/20/13



Attribute: Freeboard **Asset:** Area 6B

Asset ID: 55, 85 Address: Lowland Hill Rd.

Determination:

Elevation of the habitable or occupied portion of the asset is less

than two (2) feet above BFE. (YES)

Elevation of the habitable or occupied portion of the asset is more

than two (2) feet above BFE. (NO)

Determination methodology:

1) Refer to the most recent FEMA Flood Insurance Rate Map (FIRM) information

(http://fema.maps.arcgis.com/home/webmap/viewer.ht ml?webmap=2f0a884bfb434d76af8c15c26541a545&exte nt=-73.99491620295004,41.2261073109551,-

73.9912737631073,41.22711596758084) to determine base flood elevation (BFE) for the asset location. Compare to LiDAR GIS elevation map of the area to determine base ground elevation of the asset. Then, conduct a site visit to determine the height from the ground of the lowest habitable or occupied portion of the asset. Add this value to the ground elevation and compare to the BFE.

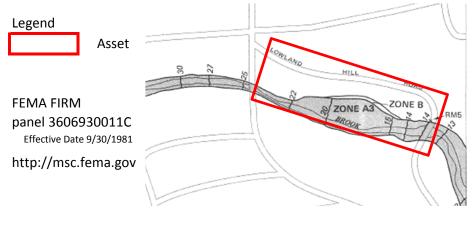
Justification: Elevations in the asset area range from 8-18 feet, with BFEs ranging from 12-21

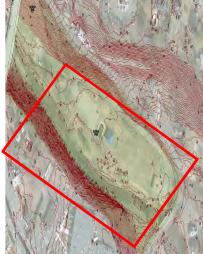
feet (NAVD88, converted from 13-22 feet NGVD29). Occupied portion of asset is

same as ground level. Asset is below BFE.

Data gaps/questions: None

Aerial photograph:





Attribute: Elevation

Asset: Area 6B Asset ID: 55, 85 Address: Lowland Hill Rd.

Determination:

Elevation of the asset site is below BFE. (YES)

Elevation of the asset site is below BFE. (YES)Elevation of the asset site is above BFE. (NO)

Determination methodology:

1) Refer to the most recent FEMA Flood Insurance Rate Map (FIRM) information

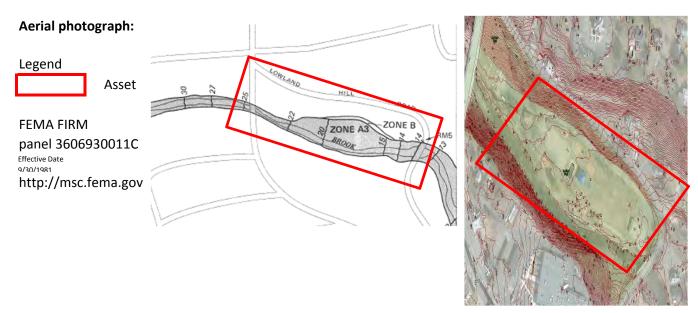
(http://fema.maps.arcgis.com/home/webmap/viewer.ht ml?webmap=2f0a884bfb434d76af8c15c26541a545&exte nt=-73.99491620295004,41.2261073109551,-73.9912737631073,41.22711596758084) to determine base flood elevation (BFE) for the asset location. Compare to LiDAR GIS elevation map of the area to determine base ground elevation of the asset. Compare this value to the

Justification: Elevations in the asset area range from 8-18 feet, with BFEs ranging from 12-21

BFE.

feet (NAVD88, converted from 13-22 feet NGVD29). Asset is below BFE.

Data gaps/questions: None



Attribute: Point of Confluence

Asset: Area 6B Asset ID: 55, 85 Address: Lowland Hill Rd.

Determination: Asset is located within area subject to increased flood risk due to

confluence of merging streams (YES)

Asset is not located within area subject to increased flood risk due to

confluence of merging streams (NO)

Determination methodology:

- Locate the asset on the Preliminary Coastal Hazards
 Composite Risk Map (http://www.arcgis.com/home/
 webmap/viewer.html?webmap=82a2fa929168434dabb6
 a3970e1d38e0). Add the National Hydrography Dataset
 layer. Determine whether there are points of confluence
 of streams, rivers, or other waterbodies in the vicinity of
 the asset.
- If a stream confluence is present, interview local residents, experts, or authorities for reports of flooding during past storms.
- 3) If mapping data is unavailable, determine presence of merging streams through site observations.

Justification: Map data shows that the area is not near a point of confluence

Data gaps/questions: None

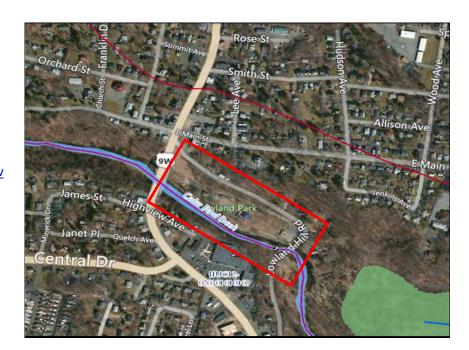
Aerial photograph:

Legend

Д

Asset

National Hydrography Dataset National Map Viewer http://viewer.nationalmap.gov



Attribute: Stormwater Discharge

Area 6B Address: Lowland Hill Rd. Asset: **Asset ID:** 55, 85

Determination: Asset is located within area subject to increased flood risk due to

storm water system discharge (YES)

Asset is not located within area subject to increased flood risk due to

storm water system discharge (NO)

Determination methodology:

- 1) Compare historic aerial imagery of the asset location (Google Earth or Sanborn maps). If the area upgrade from the asset location has developed significantly within the timeframe of available imagery, answer yes. Note years of available images in justification area below.
- 2) If historical imagery is unavailable or inconclusive, interview local residents, experts, or authorities about past flooding in the asset location.
- 3) If no information is available, answer YES.

Justification: Historic map data shows that the area surrounding the asset has not developed

significantly since 1994.

Data gaps/questions: None

Imagery Date 5/26/2011 Image USDA Farm Service Agency Imagery date 4/3/1994 Image US Geological Survey

Legend

Asset

Aerial photograph:

Google Earth 2013





Attribute: Vegetated Stream bank Buffers

Asset: Area 6B Asset ID: 55, 85 Address: Lowland Hill Rd.

Determination: Asset is within floodway fringe of stream and without adequate

vegetated buffers to absorb or divert flood waters (YES)

Asset is not within floodway fringe of stream and has adequate

vegetated buffers to absorb or divert flood waters (NO)

Determination methodology:

- 1) Identify asset location on FEMA FIRM

 (http://fema.maps.arcgis.com/home/webmap/viewer.ht
 ml?webmap=2f0a884bfb434d76af8c15c26541a545&exte
 nt=-73.99491620295004,41.2261073109551,73.9912737631073,41.22711596758084). If located in a
 zone designated A1-A30 or AE, asset is within flood fringe.
 If asset is not within flood fringe, answer no. If within
 flood fringe, continue to step 2.
- 2) Locate the asset on the Preliminary Coastal Hazards Composite Risk Map (http://www.arcgis.com/home/ webmap/viewer.html?webmap=82a2fa929168434dabb6 a3970e1d38e0). Add the USGS Land Cover NLCD_2006 layer. Determine if there are vegetated buffers between the asset and the flood source. Confirm with site observations or aerial and street-level imagery.

Justification: The asset is located partially within the flood fringe and without adequate

vegetative barrier, as seen in aerial imagery below.

Data gaps/questions: None



Legend

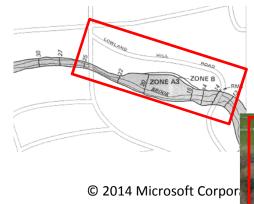
FEMA FIRM

Asset

panel 3606930011C

Effective Date 9/30/1981

http://msc.fema.gov



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Figure V-2 Vulnerability Score Determination Worksheet Completed Example

Vulnerability Score Determination Worksheet

Asset: Seaweed Yacht Club Asset ID: 24 Address: 66 Beach Rd, Stony Point, NY 10980

Asset class (select one): Economic

Instructions: 1) For each of the asset characteristics below, select the score for which the description best

 $matches \ the \ characteristics \ of \ the \ asset \ under \ consideration. \ Enter \ that \ score \ number \ in \ the$

"Score" column.

2) In the "Justification" column, explain the source of information used to make the determination. Attach any relevant documentation on the subsequent pages.3) If no information is available, use a score of 3 for that characteristic and note in the

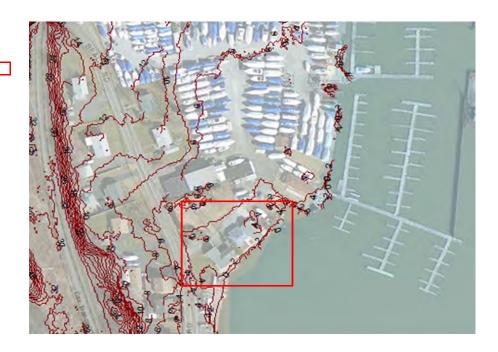
			VULNERABILITY					
	Insignificant	Minor	Moderate	Significant	Major			
Characteristic	1	2	3	4	5	Score	Weight	Justification
Impact of storms on service/function of asset (including impact from historic storms and accessibility to/from asset during storms)	Limited interruption in service or short term reduced service	Service loss for up to 1 week or longer term reduced service	Service loss for more than 1 week up to 1 month or longer term reduced service	Service loss for more than 1 month or permanent reduced capacity	Permanent loss of service of the economic asset	4	30%	Input from committee on impact of historic storms
Primary materials of construction	Glazed brick, Cast stone, clay tile, concrete, fiber or polyethylene recycled plastic lumber, stone	Common bricks, formed-in-place cement, exterior- grade treated plywood, treated solid hardwood	Wood-filled recycled plastic lumber, gypsum products (sheathing panels, gypsum board)	Tempered hardboard, exterior- grade oriented- strand board	Particle board, fiberboard	2	5%	Materials of construction appear to be exterior-grade treated plywood with vinyl siding.
Condition of asset	Perfect condition. No visible deterioration.	Minor visible deterioration (e.g. chipped paint, a few roof shingles missing)	Moderate visible deterioration, primarily superficial (e.g. damaged siding, broken windows)	Significant visible deterioration (e.g. holes in roof or walls)	Major deterioration, including structural deficiencies (e.g. partial collapse, holes in floor)	5	5%	As shown in the site photograph below, the roof structure is severely damaged and displaced.
Presence of vulnerable critical features	No critical electrical, mechanical, or instrumentation features in flood-prone locations	Cellar entrance or grate in flood-prone location	Mechanical equipment in flood-prone location	Instrumentation or control equipment in flood-prone location	Electrical equipment in flood-prone location	4	30%	Boat maintenance equipment at ground level
Vulnerable population occupation	No occupation by vulnerable populations	0-20% vulnerable population occupancy	20-50% vulnerable population occupancy	50-70% vulnerable population occupancy	70-100% vulnerable population occupancy	1	5%	There is no occupation by vulnerable populations
Floor elevation relative to BFE (freeboard)	More than 2 ft. above BFE	0-2 ft. above BFE	At BFE to 1 ft below BFE	1-3 ft. below BFE	More than 3 ft. below BFE	5	25%	According to the LiDAR map, the elevation of the asset is 0-4 ft, while the BFE for 100-year storm is 12 feet, as shown in the FEMA Flood Hazard Map
·				Ove	erall Vulnerability Score:	4	100%	

Vulnerability Score Determination Worksheet

Use this page to attach any relevant documentation.

USACE 2012 Post-Sandy LiDAR http://www.csc.noaa.gov/lidar

Legend Asset



FEMA Best Available Flood Hazard Data 2013

http://fema.maps.arcgis.com/home/ webmap/viewer.html?webmap=2f0a 884bfb434d76af8c15c26541a545&ext ent=-

73.99491620295004,41.22610731095 51,-

73.9912737631073,41.227115967580 84

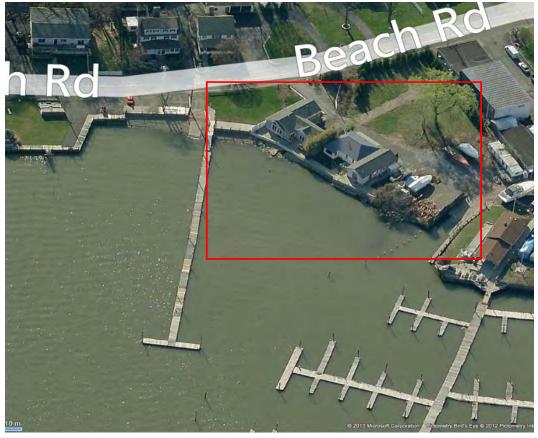


Vulnerability Score Determination Worksheet

Site Visit Photographs J. Reed 20-Nov-13 Seaweed Yacht Club



Pictometry Bird's Eye ©2012 Pictometry International Corp



E. End Notes

Photo Credits

Cover Page:

Stony Point from the Air (Patrick Magee)

Waterfront Seen from Stony Point Battlefield (Chris Robbins)

Dividers:

Section I

Stream Bank Erosion on Cedar Pond Brook (Kevin Maher)

Danger - Unsafe Structure (Thomas McGuire)

Debris on the Waterfront (Thomas McGuire)

Marina District on Beach Road (Patrick Magee)

Section II

Hurricane Irene Flooding at Lowland Park (Luanne Konopko)

Damaged Boats and Damaged Houses (Thomas McGuire)

Downed Trees near the Waterfront (Thomas McGuire) Jetties on River Road (Chris Robbins)

Section III

Stony Point Sunrise (Thomas McGuire)

Motorcyclists Rally to Support Superstorm Sandy Victims (Dominick Posillipo)

Collapsed Structure in River Front Park (Thomas McGuire)

Fall Color in Stony Point (Alice Brown)

Section IV

Damaged House in Grassy Point (Thomas McGuire) Stony Point from the Hudson River (Chris Robbins) Debris Scattered on a Jetty (Thomas McGuire) Marina at Dusk (Chris Robbins)

Section V

Waterfront Seen from Stony Point Battlefield (Chris Robbins)

Third Public Engagement Meeting (Luanne Konopko)

Damaged Docks at Ba Mar (Thomas McGuire)

Stony Point Battlefield and Lighthouse (Patrick Magee)

Methodology and Other Technical Notes Cost Benefit Analysis

Methodology for Full Time Equivalent (FTE) Job Projections: A number of different methods were utilized to determine projections of estimated retained and/or added employees. Four approaches were utilized - depending on the baseline assumptions of the project:

- 1. The business to be potentially displaced/ retained was identifiable by name: In this case we used employment counts from a public source such as Manta.com or Dun & Bradstreet. Typically, businesses need to be of a certain size to be recorded by one of the business databases. Smaller establishments and branch offices tend to be missing.
- 2. The business to be potentially displaced/ retained was not identifiable by name (or was not part of one of the business databases). In this instance, we reviewed aerial photographs to estimate the total square footage of the business. We then applied an industry standard ratio to determine employment. For example, a use ratio of 1 FTE per 500 square feet for retail and 1 FTE per 1,000 square feet of industrial space was used to determine employment. A similar approach was used to determine potential employment to be added through a project with defined potential build out conditions.
- 3. Individual facilities without a defined scope: This methodology was applied primarily to emergency shelters. Since not much was known about the size and specific time of operation of these facilities, it was assumed that fewer than 5 FTEs, the smallest employment range category, would be necessary to operate the facility. Similar assumptions were made for single facility expansions.
- 4. Area-wide improvements without a defined scope: For projects with an undefined scope that affect multiple facilities (such as improvements to a downtown district), it was assumed that 10 employees or less would be retained/added. This was based on the assumption that each district would house no more than 10 small businesses and each of the businesses would be able to retain/add one employee.

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F. Glossary

AKRF AKRF, Inc.

BFE Base Flood Elevation

CBA Cost-Benefit Analysis

CDBG-DR Community Development Block Grant – Disaster Recovery

CDM CDM Smith, Inc.

CHPE Champlain Hudson Power Express

Consultant The AKRF/CDM Team Assigned to Stony Point

Team

CPCB Community Planning and Capacity Building

CRS Community Rating System

EOCC Emergency Operations Command Center

FEMA Federal Emergency Management Agency

FHWA Federal Highway Administration

FIRMs Flood Insurance Rate Maps

GIS Geographic Information System

GOSR Governor's Office of Storm Recovery

HSS Health and Social Services

HUD U.S. Department of Housing and Urban Development

LWRP Local Waterfront Revitalization Program

NCR Natural and Cultural Resources

NDRF National Disaster Recovery Framework

NFIP National Flood Insurance Program

NOAA National Oceanic and Atmosphere Administration

NYRCR New York Rising Community Reconstruction

NYRCR Catskills/

Hudson Valley

Regional Lead Lori DuBord, Governor's Office of Storm Recovery

New York State

NYS DEC New York State Department of Environmental Conservation

NYS DHCR NYS Department of Housing and Community Renewal

NYS DOS NYS Department of State

NYS DOS

Lead Planner William Harding

NYS DOS

Planners Barbara Kendall, Lisa Melville

NYS DOT New York State Department of Transportation

RSF Recovery Support Function

Sasaki Associates, Inc.

Stony Point NYRCR

Planning Committees Stony Point Community Co-Chairs and At-Large Members

USACE United States Army Corps of Engineers

USEPA United State Environmental Protection Agency

USFWS United States Fish and Wildlife Service

USGS United States Geological Survey