

Greater Bay Shore

NY Rising Community Reconstruction Plan



NY Rising Community Reconstruction Program

December 2014





Greater Bay Shore NY Rising Community Reconstruction Plan

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This document was developed by the Greater Bay Shore NY Rising Community Reconstruction (NYRCR) Planning Committee as part of the NY Rising Community Reconstruction Program within the Governor's Office of Storm Recovery (GOSR). The NYRCR Program is supported by New York State (NYS) Homes and Community Renewal and NYS Department of State. The document was prepared by the following consulting firms: Jacobs and Cameron Engineering.

Front Cover: Visitors at Bay Shore Marina Park enjoy the benefits of Greater Bay Shore's waterfront.
Source: Jacobs

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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, within the Governor's Office of Storm Recovery (GOSR), empowers the State's most impacted communities with the technical expertise and funding resources 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 \$700 million planning and implementation program 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.

Launched in the summer of 2013 and completed in March 2014, Round I of the NYRCR planning process included 50 NYRCR Planning Areas, comprising 102 storm-impacted localities. In January 2014, Governor Cuomo announced a second round of the planning process, serving an additional 22 storm-impacted localities. Four of these localities were absorbed into existing Round I NYRCR Planning Areas, bringing the number of localities participating in Round I up to 106; the other 18 localities formed 16 new Round II NYRCR Planning Areas. Between Rounds I and II, there are 66 NYRCR Planning Areas, comprising 124 localities. The program serves 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.

In Rounds I and II, the State allotted between \$3 million and \$25 million to each participating locality for the implementation of eligible projects identified in the NYRCR Plan. The funding for these projects is



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provided through the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) program.¹

Each NYRCR Planning Area is represented 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 650 New Yorkers have represented their communities by serving on Planning Committees. Nearly 650 Planning Committee Meetings have been held, during which Planning Committee members worked with the State’s team to develop community reconstruction plans, which identify opportunities to make their communities more resilient. All meetings were open to the public. An additional 250+ Public Engagement Events attracted thousands of community members, who provided feedback on the planning process and resulting proposals. The NYRCR Program’s outreach has included communities that are traditionally underrepresented, such as immigrant populations and students. All planning materials are posted on the program’s website (www.stormrecovery.ny.gov/nyrcr), providing several ways for community members and the public to submit feedback on the program and materials in progress.

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

The NYRCR Program does not end with this NYRCR Plan. Governor Cuomo has allotted over \$700 million for planning as well as implementing eligible projects identified in NYRCR Plans. NYRCR Planning Areas are also eligible for additional funds through the NY Rising to the Top Competition, which evaluates applications from Round II NYRCR Planning Committees across three categories—Regional Approach, Inclusion of Vulnerable Populations, and Use of Green Infrastructure. The winner of each category will be allotted a share of the competition’s \$3.5 million to fund additional eligible projects.

In April 2014, Governor Cuomo announced that projects identified in NYRCR Plans would receive priority consideration through the State’s Consolidated Funding Application (CFA) process and charged the Regional Economic Development Councils (REDCs), which play an advisory role in the CFA process, to support NYRCR projects. In December 2014, Governor Cuomo announced that 24 NYRCR projects received nearly \$12 million in CFA funding. This announcement is an example of the Governor honoring his commitment to leverage the work of the NYRCR Planning Committees to incorporate resilience into other State programs and to find additional sources of funding for NYRCR projects. The NYRCR Program is also working with both private and public institutions to identify existing funding sources and to create 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 REDC State Agency Review Teams

¹ Five of the Round I Planning Areas—Niagara, Herkimer, Oneida, Madison, and Montgomery Counties—are not funded through the CDBG-DR program.



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(SARTs), composed of representatives from dozens of State agencies and authorities, for feedback on projects proposed by NYRCR Planning Committees. 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 the Greater Bay Shore NYRCR Planning Committee, which is passionately committed to realizing a brighter, more resilient future for its community.

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 Planning Committee's prioritization of these projects and actions. **Proposed Projects** are projects proposed for funding through an NYRCR Planning Area's allotment 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 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.

As part of Round II of the NYRCR Program, the Greater Bay Shore NYRCR Planning Area has been allotted up to \$3 million in CDBG-DR funds for the implementation of eligible projects identified in this plan.

While developing projects for inclusion in NYRCR Plans, 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 satisfy a Federally-designated eligible activity category, fulfill a national objective (i.e., 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 GOSR will consider, in consultation with local



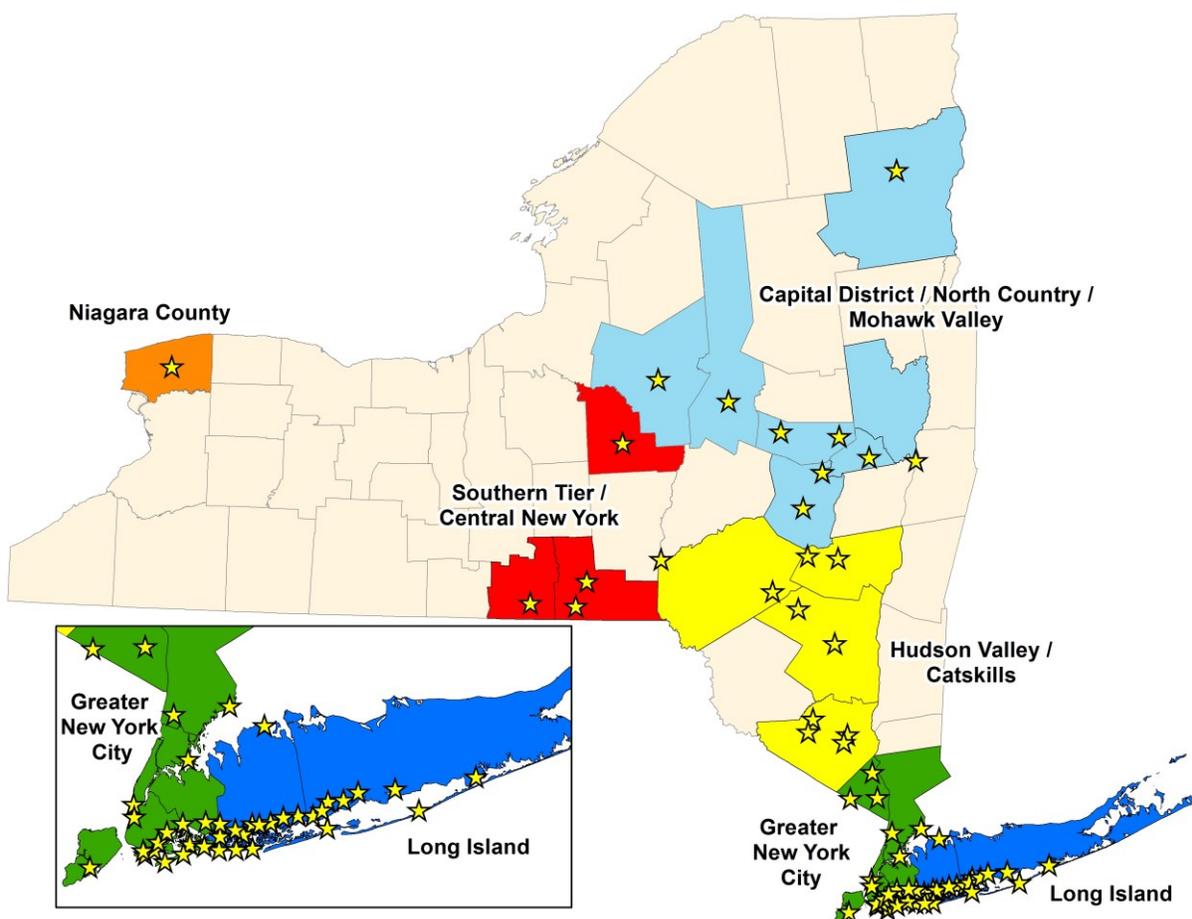
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municipalities and nonprofit organizations, when determining which projects and actions are best positioned for implementation.

The total cost of Proposed Projects in this NYRCR Plan exceeds the NYRCR Planning Area's CDBG-DR allotment 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. 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. Projects will be implemented on a staggered timeline, and the NYRCR Program will choose an appropriate State or local partner to implement each project. GOSR will actively seek to match projects with additional funding sources, when possible.

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.

NY Rising Communities



Note: Map displays the 66 NYRCR Planning Areas from Rounds I and II. (Five of the Round I Planning Areas—Niagara, Herkimer, Oneida, Madison, and Montgomery Counties—are not funded through the CDBG-DR program.)



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“In my 20 years of being involved with the Fire Department, I’ve travelled across the State to other areas that have been hit by natural disasters. I’ve never witnessed the type of damage I witnessed in Bay Shore and the Town of Islip that was sustained from Sandy! I’ve never seen such masses of people in desperation for help and at the same time I have never seen the Community rally to help one other the way that they did.”

- Brian Butler, Bay Shore Fire Department Chief and Greater Bay Shore NYRCR Planning Committee Co-Chair



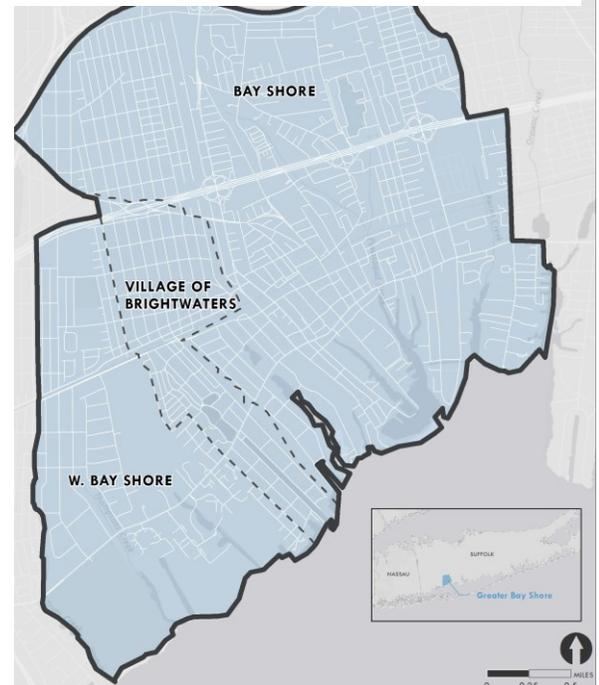
Executive Summary

Introduction

Greater Bay Shore is located along the South Shore of Suffolk County, Long Island. This NY Rising Community Reconstruction (NYRCR) Program Community encompasses an area of 15.4 square miles composed of West Bay Shore (3.96 square miles) and Bay Shore (9.7 square miles) within the Town of Islip and the incorporated Village of Brightwaters (1.75 square miles). The Community features extensive waterfront (almost 9 miles long) on the Great South Bay and is a gateway to and a lifeline for Fire Island. Bay Shore’s downtown is reminiscent of a quaint Main Street USA with a thriving mix of family-owned shops and local businesses with newer restaurants and retail shopping.

As part of the ongoing recovery from Superstorm Sandy, Greater Bay Shore’s NYRCR Planning Committee (Committee) took on the responsibility of developing a plan that laid the groundwork for the Community’s resilient future. The composition of the Committee includes a cross-section of Greater Bay Shore’s population including members of business and community organizations, local residents, and municipal representatives. Greater Bay Shore’s NYRCR Committee Co-Chairs were selected by the Committee in consultation with the State of New York. With the entire Community involved, and with the help of New York State, the Committee has produced a forward-thinking, pragmatic recovery, and resiliency plan.

The Greater Bay Shore NYRCR Planning Area





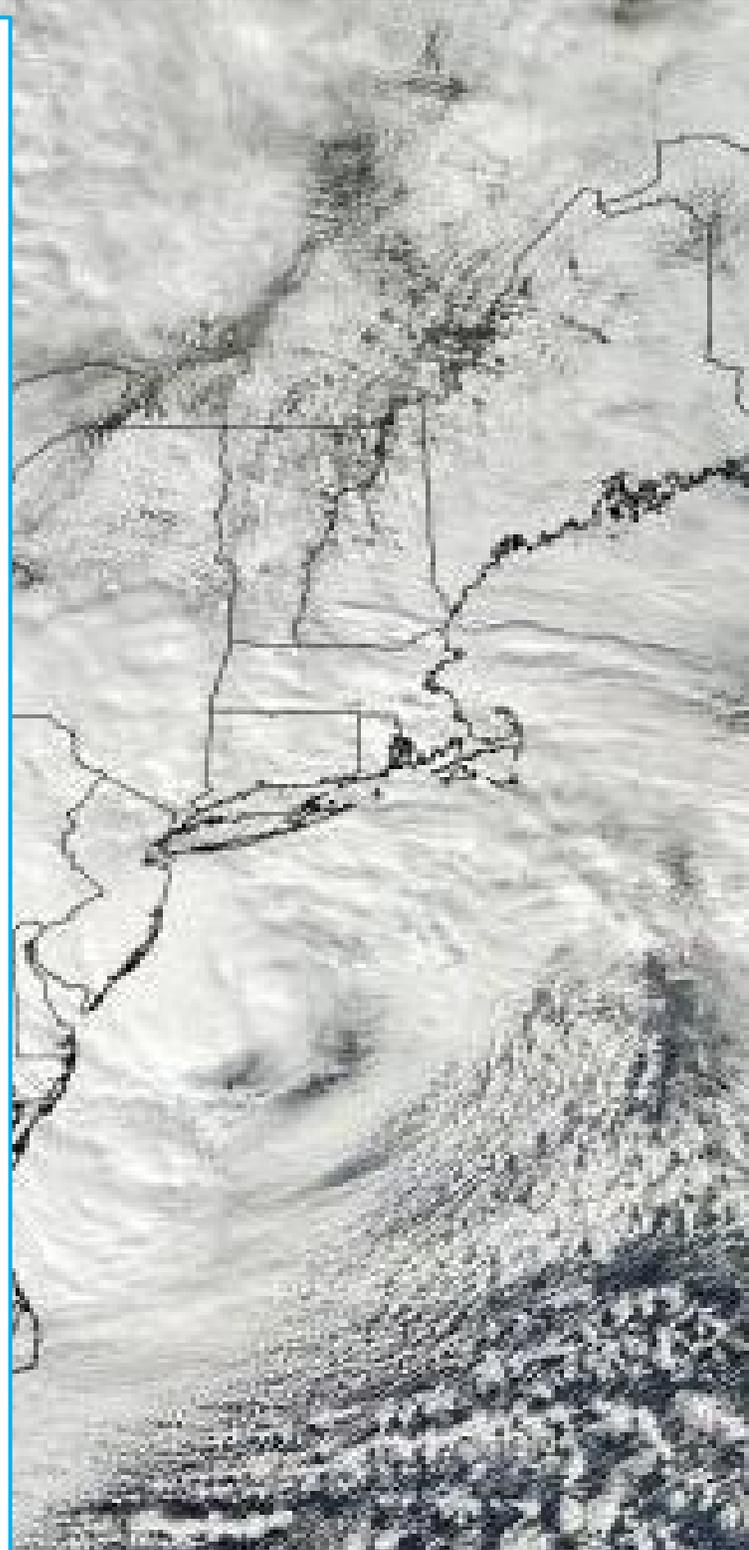
Overview

NY Rising Community Reconstruction (NYRCR) Greater Bay Shore (Community) is one of an additional 22 Communities across the State that was designated to participate in Round II of the NY Rising Community Reconstruction Program. Greater Bay Shore is the ninth, and only Round II, Community in Suffolk County of the NYRCR Program. A total of up to \$3 million has been allotted for reconstruction and resiliency projects within the Greater Bay Shore Community.

The Greater Bay Shore community is civic-minded with a range of community organizations, religious institutions, and recreational amenities. This is a proud community that has a strength in purpose and always takes the opportunity to do the right thing. Greater Bay Shore is a place to call home. It considers itself the “heart of the South Shore.”

After passing through the Caribbean -- including Jamaica, Cuba and the Bahamas -- and fluctuating between a Category 1 and Category 2 Hurricane, Sandy turned north toward the US coast on Saturday, October 27, 2012. The storm made landfall near Atlantic City, NJ, around 8 PM on Monday, October 29. The winds had decreased to just below the threshold for a Category 1 Hurricane and meteorologists and the press christened this near hurricane as “Superstorm Sandy.”

Superstorm Sandy’s historically unprecedented path approached New Jersey and New York from the east; storms typically approach from the south. As a result, the track of Superstorm Sandy resulted in a worst-case scenario for storm surge and inundation in coastal regions from New Jersey north to Connecticut including New York City and Long Island. The storm surge came ashore near the time of high tide along the South Shore of Long Island during a full moon, when tides are strongest. Greater Bay Shore was immediately inundated with an estimated 3.4 feet of water on top of the morning tide of 1.3 feet (based on NOAA tide tables) that had already inundated the bay front shore and had yet to retreat. Bulkheads were battered by debris, floating docks and boats were tossed on land, damaging homes and property along the shoreline. Superstorm Sandy’s storm surge significantly impacted the Community and affected the entire coastal frontage as well as inland areas of Greater Bay Shore.



Satellite imagery of Superstorm Sandy as it approaches the tri-state area.

Source: NOAA



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Concourse West remained inundated the day after Superstorm Sandy and was impassable as a result.
Source: Greater Bay Shore NYRCR Planning Committee



In advance of the storm, thriving and beloved waterfront establishments such as Captain Bill's, Swept Away (formerly Cool Water Grill); Molly Malone's and Fatfish took precautions like sandbagging entrances and boarding up windows. Still, many of these restaurants were severely compromised by the winds and flooding. With the help of their staff and the Community, Captain Bill's at 122 Ocean Avenue was re-built, reopening the day after Thanksgiving 2012. While Molly Malone's on Maple Avenue sustained extensive damage, it was eventually rebuilt as well.

The Bay Shore Fire Department (BSFD) mobilized in the days ahead of Superstorm Sandy's landfall with advance planning meetings and equipment preparation. The BSFD was flooded with hundreds of calls for emergency assistance with the earliest received mid-day on October 29th. The BSFD's Dive Team used inflatables to rescue trapped residents south of Montauk Highway, on Shore Lane, Maple and South Clinton Avenues. During and in the days immediately after the storm, the BSFD braved dangerous conditions to respond to structure fires, as well as live, burning and downed wires, flooding conditions and fallen trees.

In the weeks following the storm the Bay Shore Fire Department Headquarters at 195 Fifth Avenue was used as a public safety response area, an Island Harvest distribution point and a donation collection center. The Red Cross also used the Fire Department as a base and dozens of out-of-state utility workers were housed in the facility for several days. The BSFD's reach was felt on a regional scale as well when their members traveled east in November 2012 to assist a number of Nassau County fire departments in providing adequate protection to their communities.

Volunteer fire fighters from the Bay Shore Fire Department on a search and rescue operation during Superstorm Sandy.
Source: Bay Shore Fire Department





Community Identified Issues

Through the Committee process, as well as feedback gained at the Public Engagement Events, critical issues related to Greater Bay Shore’s recovery from Superstorm Sandy as well as future resiliency needs were identified. These issues helped define needs, opportunities, strategies, and projects that would make Greater Bay Shore a more resilient and sustainable community. Critical issues included:

- **Repetitive and severe flooding.** Many locations in the Community are subject to chronic flooding as a result of tidal surges, heavy rain storms, and extreme high tides.
- **Extended recovery time for basic services.** Following Superstorm Sandy, the return of basic services (electric, gas, internet, telephone) took from a few days to a couple of weeks — for structures that were in otherwise sound condition.
- **Resiliency of ferry terminals/marina.** Bay Shore is the primary terminal for public and private passenger and freight service to Fire Island and functions as a regional asset.
- **Presence of vulnerable population.** There are people in every community that are particularly vulnerable to the strains and hardships associated with a major storm and the recovery period. These include individuals with disabilities, low- and very-low income, the elderly and young children, homeless, and people at risk of becoming homeless.
- **Communications and educational outreach before, during and after storms.** The need for accurate information to plan for, withstand and recover from storms is critical to the Community’s well-being. This is especially important for vulnerable populations and those with English as a Second Language (ESL).
- **Maintaining critical services and access at LIJ Southside Hospital.** The Committee and public indicated that roadway flooding and the potential for flooding at (and adjacent to) the Hospital is a major concern because the continuity of the operation of the hospital is vital to the well-being of both the health and the economy of Bay Shore and the surrounding area.
- **Water quality.** The Town of Islip’s Great Cove Watershed Study, in 2012, identified untreated surface runoff as one of the causes of deteriorating water quality in Great Cove and within the streams and creeks that drain to the Cove and the Great South Bay. In addition, the Community expressed concern for streams and creeks that have become overgrown and silted. This affects the capacity of natural waterways to collect, store, filter and discharge water into the Bay.
- **Continued recovery of the local economy including Downtown Bay Shore.** A critical issue to the Community is the continued recovery of Downtown Bay Shore as the anchor of the local economy.

COMMUNITY IDENTIFIED ISSUES

FLOODING

RECOVERY TIME FOR SERVICES

RESILIENCY OF FERRY TERMINALS
& MARINAS

VULNERABLE POPULATIONS

COMMUNICATION & OUTREACH

MAINTAINING CRITICAL SERVICES &
ACCESS AT HOSPITAL

WATER QUALITY

CONTINUED RECOVERY OF LOCAL
ECONOMY



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NYRCR Program: A Community-Driven Process

As directed by Governor Andrew M. Cuomo at the outset of this process, the Greater Bay Shore Community's goal was to "build back better". The NYRCR planning process allowed the real "experts"-- residents of the communities that were confronted first-hand by Superstorm Sandy -- to define the issues, generate the ideas, and provide meaningful input that shaped this NYRCR Plan. During the numerous Planning Committee Meetings, Public Engagement Events, discussions, and site tours, Committee members and the public drew on their own experiences and on input from their neighbors to identify approaches and projects that would strengthen the community's resiliency. Based on this input, the Committee began the process of formulating a future vision of a more resilient Greater Bay Shore.

The Greater Bay Shore Committee spent significant time and effort in developing a vision for their community's resilient future. This vision was based on establishing a series of goals that could act as targets or waypoints for the Community on its journey towards resiliency. Informed by public input from community members, the Community Vision Statement represents a consensus assessment of the direction this Community wishes to move.

All strategies and projects identified were measured against the Community Vision Statement to ensure that recommended actions would not detract from the Community achieving its desired goals.

VISION STATEMENT

Picturesque Greater Bay Shore, including the mile-square Village of Brightwaters, is the heart of Long Island's South Shore. With the Great South Bay as our backyard, we are the gateway to the National Seashore, a lifeline to Fire Island, and serve over one million visitors each year. The economic vitality of our historic downtown and the nearby marinas, docks and ferry services are crucial to our identity and future well-being. We are proactively pursuing a future that supports a resilient and sustainable economy while also reducing damage from future storm events and strengthening our ability to recover from these events. Greater Bay Shore is a caring, culturally diverse community, united in spirit, purpose, and values.



"From our Planning Committee's initial meeting, we recognized the enormity of our challenge to formulate resiliency strategies and reconstruction projects that could protect Greater Bay Shore in the future. But what began as a formidable mission evolved into a more achievable task because the NY Rising Community Reconstruction Program assigned us a team of extraordinary professionals to lead, teach, and work with us. These experts from the Governor's Office of Storm Recovery and the Consultant Team truly listened and used our input to define our community's important assets, strengths, and values. Together we reviewed and detailed the incredible damage done by Superstorm Sandy and determined the critical issues and needs of our vulnerable waterfront community. After many months of positive engagement and transformative analysis with the team, our committee has developed a reconstruction plan of projects and actions to help ensure our community's future well-being. It was a privilege to serve on this committee, and I applaud the team's outstanding service to their fellow New Yorkers."

- Donna Periconi, Greater Bay Shore NYRCR Planning Committee Member & Chamber of Commerce of Greater Bay Shore



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Public Engagement Process

A critical component of the NYRCR Program was the transparent exchange of information by the Consultant Team, the Committee, and the public to identify appropriate projects, strategies, and solutions likely to carry Community support. The public included residents, some of whom also represented civic groups, neighborhood and homeowner associations, environmental and business groups, as well as educational, medical, religious and other institutions. In addition, employees of businesses, representatives of the media, and elected/appointed officials expressed interest in the process and provided their input.

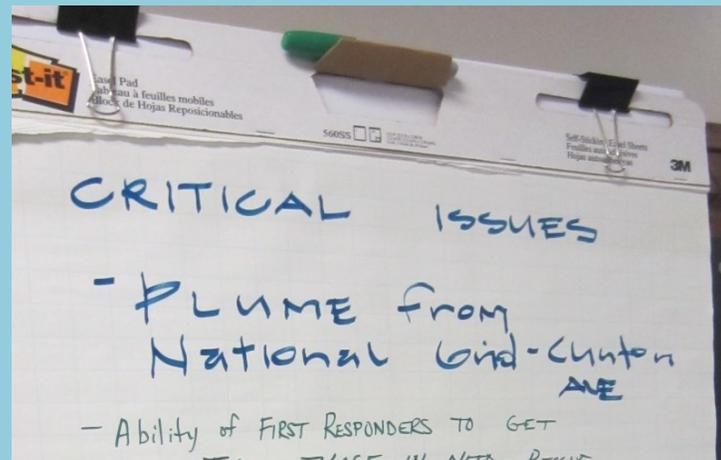
The Greater Bay Shore NYRCR Committee was composed of residents who could speak directly from experience of the character of the community and its needs and strengths in good times and bad. Ten Committee meetings were held, all of which were open to the public, with meeting dates and times posted on the NYRCR website (www.stormrecovery.ny.gov/nyrcr). Comment forms were available at Committee Meetings, Public Engagement Events, and on the NYRCR website to provide an opportunity for the public to contribute their feedback, which was then passed along to the Committee.

The feedback was reviewed by the Committee and incorporated into the decision-making process that informed the development of this NYRCR Plan. Three well-attended, open-house style events were held during the development of the NYRCR Plan and a fourth will present this final document. Additionally, the public was encouraged to participate in “online public meetings” in association with Public Engagement Events #1 and #2.



There was animated discussion and feedback at Public Engagement Event #1, July 2014.

Source: Jacobs



The Community identified critical issues during Public Engagement Event #2, September 2014.

Source: Jacobs



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NYRCR Plan: A Blueprint for Resiliency

An asset inventory was conducted for the Greater Bay Shore Community to identify assets, both built and natural, which are critical to the safety, resiliency, and character of the Community. The assets were evaluated in detail to understand their level of risk to, or potential for damage during future storm events. Identification of risks to critical assets provided the framework within which resiliency strategies were developed. Strategies are general approaches to types of projects, programs, policies, or other actions that specifically address an identifiable need or leverage an existing opportunity within the Community. For every need or opportunity, potential strategies were generated for each resiliency issue. The list of strategies spanned an array of methodologies and timeframes, from preparedness to retrofits, from immediate procedural improvements to long-range capital investment programs.

Three tiers of projects were identified: Proposed Projects, Featured Projects, and Additional Resiliency Recommendations. The order in which the projects and actions are listed in this NYRCR Plan does not necessarily indicate the Planning Committee’s prioritization of these projects and actions. **Proposed Projects** are projects proposed for funding through an NYRCR Planning Area’s allotment 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 voting members of the Planning Committee.

Table ES-1. Greater Bay Shore NYRCR Proposed & Featured Projects

Strategy	Project Name & Description	Project Category
Ensure adequate resources to enhance the ability of Community-Based Organizations (CBO) to prepare for, and respond to local emergencies.	Greater Bay Shore Resiliency Generator Project: Permanent placement of fixed generators at 7 crucial community facilities.	Proposed
	Community-Based Organizations (CBO) & Vulnerable Population Emergency Action & Education Plan: Development of a plan to enable CBOs to coordinate their efforts to address emergency preparedness education, evacuation, and long-term resiliency needs of vulnerable populations.	Proposed
Ensure public safety and the ability of first responders to promptly and effectively react to severe storm events and other emergencies.	Fire and Rescue Communications: Upgrade communications equipment to eliminate incompatibility of equipment among first response agencies.	Proposed
	Fire and Rescue Equipment: Purchase of essential Search and Rescue equipment.	Proposed
	Enhanced GIS Emergency Management System: Project to enhance a Town-wide GIS system to improve storm response and recovery.	Proposed
	Greater Bay Shore Resiliency Generator Project	Proposed
Improve the economic resiliency of the Community.	Bayview Avenue, Bay Shore Waterfront Corridor Improvement: “Complete Streets” improvements on Bayview Avenue between Ocean and South Clinton Avenues to improve parallel access and evacuation opportunities along waterfront.	Featured



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Table ES-1. Greater Bay Shore NYRCR Proposed & Featured Projects (Cont'd)

Strategy	Project Name & Description	Project Category
Provide for the unique needs and requirements of vulnerable populations including the elderly, individuals with disabilities, and low income residents.	Community-Based Organizations (CBO) & Vulnerable Population Emergency Action & Education Plan	Proposed
	Penataquit Village Housing Resiliency Enhancements: Project to install a series of “green” drainage improvements on a Town of Islip-owned parcel with existing multi-family residential housing.	Proposed
	Bayview Avenue, Bay Shore Waterfront Corridor Improvement	Featured
Encourage safe and resilient housing for all residents	Penataquit Village Housing Resiliency Enhancements	Proposed
Ensure continuity of service and access to critical health care facilities and to public safety services.	Drainage, Roadway & Utility Infrastructure Initiative: This initiative would undertake the design, engineering, and hydrologic study of 5 locations within the Community.	Featured
Integrate “Green” and “Gray” infrastructure (natural and engineered stormwater management system) to holistically manage stormwater and reduce flooding.	Stream Corridor & Lakes Drainage Capacity Improvement Initiative: Project to undertake a comprehensive drainage analysis, design, and long-term management recommendations for 6 north-south stream corridors and a series of artificial lakes in Brightwaters.	Proposed
	Penataquit Village Housing Resiliency Enhancements	Proposed
	Stream Corridor Drainage Capacity Improvement Initiative Implementation: Implementation of recommendations from the <i>Stream Corridor & Lakes Drainage Capacity Improvement Initiative</i> .	Featured
	Great Cove Watershed Improvement Project: Implementation of 4 projects contained in the Great Cove Watershed Management Plan.	Featured
Mitigate flooding from the Great South Bay.	Phase I: Brightwaters Canal Improvements: Project to replace 500 linear feet of deteriorated and/or damaged bulkheading along the Canal.	Proposed
	Phases II & III: Brightwaters Canal Improvements: Project to replace a total of 1,000 linear feet (two 500-linear foot phases) of deteriorated and/or damaged bulkheading along portions of the Canal.	Featured

Washed out local roadway in Greater Bay Shore.

Source: Jacobs





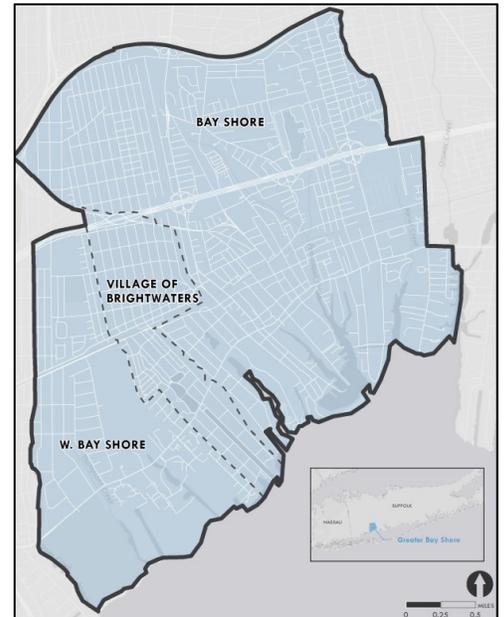
Section I: Community Overview

Greater Bay Shore is located along the South Shore of Suffolk County, Long Island. This NY Rising Community Reconstruction (NYRCR) Program Community encompasses an area of 15.4 square miles composed of the incorporated Village of Brightwaters (1.75 square miles) as well as West Bay Shore (3.95 square miles) and Bay Shore (9.7 square miles) within the Town of Islip. Greater Bay Shore is bounded by West Islip to the west and Islip to the east. North Bay Shore and Baywood lie to the north of Southern State Parkway with Brentwood to the northeast. The Community features extensive waterfront (almost 9 miles long) on the Great South Bay and is a gateway to and a lifeline for Fire Island. Bay Shore's downtown is reminiscent of a quaint Main Street USA with a thriving mix of family-owned shops and local businesses with newer restaurants and retail shopping.

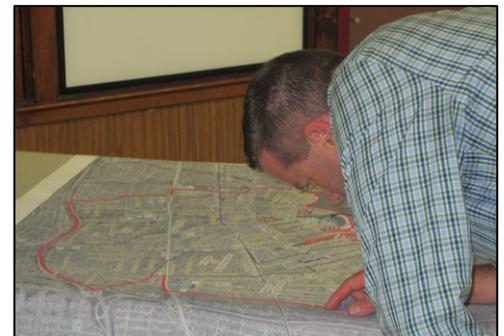
Greater Bay Shore is civic-minded with a range of community organizations, religious institutions, and recreational amenities. This is a proud community that has strength in purpose and always takes the opportunity to do the right thing. Greater Bay Shore is a place to call home. It considers itself the "heart of the South Shore."

As part of the ongoing recovery from Superstorm Sandy, Greater Bay Shore's NYRCR Planning Committee (Committee) took on the responsibility of developing a plan that laid the groundwork for the Community's resilient future. The composition of the Committee included a cross-section of Greater Bay Shore's population including members of business and community organizations, local residents, and municipal representatives. Greater Bay Shore's NYRCR Committee Co-Chairs were selected by the Committee in consultation with the State of New York. With the entire Community involved, and with the help of New York State, the Committee has produced a forward-thinking, pragmatic, recovery and resiliency plan.

The NY Rising Community Reconstruction Greater Bay Shore Community (Community) is one of an additional 22 Communities across the State that was designated to participate in Round II of the NYRCR Program. Greater Bay Shore is the ninth, and only Round II, Community in Suffolk County of the NYRCR Program. A total of up



The Greater Bay Shore NYRCR Planning Area



Inundation maps were reviewed at Public Engagement Event #1, July 2014.

Source: Jacobs



Greater Bay Shore NY Rising Community Reconstruction Plan

to \$3 million has been allotted for reconstruction and resiliency projects within the Greater Bay Shore Community.¹

Historic Context

The history and development of Greater Bay Shore (Bay Shore, Brightwaters, and West Bay Shore) is closely tied to the coastal location of the communities on the Great South Bay. The names - “Bay Shore” and “Brightwaters”- speak for themselves; they harken to the bay and the waters that gave life to the communities and are the essence of their identities to this day.

Originally settled by Native Americans, Greater Bay Shore was settled by the Europeans over 300 years ago. This included the development of Sagtikos Manor in West Bay Shore in about 1697. In 1708, the land that is now Bay Shore was acquired by John Mowbray. Over the years that followed, Bay Shore and its immediate environs continued to grow as a regional center and focus of activities.

Bay Shore

In the late 1800s, Bay Shore became an important center of activity in southwestern Suffolk County. This included the growth of commerce as well as institutional, civic, and religious uses. The downtown began to grow as retail stores, offices, churches and other uses located and expanded. Some notable milestones during this period included: the first steam ferry service to Fire Island in 1862; the opening of the railroad station in 1868; the first bank in 1887; electric, water and telephone services between 1889 and 1892.²

For the first half of the twentieth century Bay Shore prospered. The downtown was healthy and vibrant and the community was strong and proud. Downtown Bay Shore was the place to go for shopping, dining and to see the latest movie. However, as suburban development expanded in western Suffolk County following World War II, downtown Bay Shore began a period of decline.

Similar to many downtown areas throughout the nation, Greater Bay Shore was subject to the social trends of the 1970s. These trends included de-institutionalization of patients from mental hospitals in tune with shifting philosophies about the treatment of mental health, as well as the proliferation of big box retail. Pilgrim Psychiatric Center (formerly known as Pilgrim State Hospital) is



Sportsmen at the waterfront in Bay Shore.

Source: Treasured Memories of Bay Shore



West Main Street, mid-1920s.

Source: Treasured Memories of Bay Shore



Greater Bay Shore NY Rising Community Reconstruction Plan

located to the north of Greater Bay Shore in Brentwood. This facility opened in 1931 with a peak of 13,785 patients in 1954.³ Beginning in the 1970s, trends in mental health care caused the discharge of psychiatric patients from this facility and others across the nation. Many of the former Pilgrim patients relocated to downtown Bay Shore (approximately 5.5 miles away) where they attempted to resume their lives but without appropriate professional support. In 1977, a large Suffolk County social services facility was built between Third and Fourth Avenues north of Main Street to provide welfare, Medicaid and parole programs.⁴ This Suffolk County facility, located in close proximity to the Bay Shore LIRR Station, served a local population of former patients as well as a larger regional population from across the County.

This trend coincided with construction of the South Shore Mall (now called the Westfield South Shore), two miles from downtown, which introduced large retail chain stores. The result was the loss of both business and businesses from Main Street.⁵ This period was noted in the Town of Islip's *Comprehensive Plan of 1976* which put forth a program to begin to reverse the decline. The business district struggled through periods of ups and downs before hitting bottom in the 1990s when downtown Bay Shore had the highest vacancy rate of any downtown in Suffolk County (over 42% in 1996).⁶

The Community reacted to this situation with a strong and tenacious response. A multitude of community organizations came together to take action to reverse the decline and reinvent the downtown. Some of the involved organizations were the Chamber of Commerce of Greater Bay Shore, the Bay Shore Union Free School District, the Bay Shore Brightwaters Summit Council, Bay Shore Business Improvement District, Long Island Jewish (LIJ) Southside Hospital, Bay Shore-Brightwaters Public Library, Great South Bay YMCA, local civic organizations, clergy, business owners, realtors, developers, and municipal, County, State, and Federal representatives and staff. The approach to change was incremental, but comprehensive, and inclusive. Working with Town, County and State partners, assistance was secured for needed projects and policies. Examples of projects included urban renewal for the removal of blight (e.g., Smith Avenue) and the development of affordable housing such as South Wind Village, Sunnybrook, and Cortland Square. Other projects involved opening-up water vistas with park improvements using Federal transportation enhancement and New York State Office of Parks, Recreation & Historic Preservation (OPRHP) funding. Notable projects along Main Street



Greater Bay Shore NY Rising Community Reconstruction Plan

included “streetscape” enhancements using Suffolk County Downtown Revitalization Grant funds and façade improvements through the use of Community Development Block Grant (CDBG) funds. Examples of policies that were implemented were zoning code updates to encourage mixed-use development; zoning map changes to redefine the downtown overlay district; and the relocation of a methadone treatment center out of the downtown.

There are many notable actions that occurred during this period but a few examples include: a diversification of the downtown economy (e.g., expansion of the medical/health services industry, increase in housing including mixed use development, promotion of restaurants, theaters and similar leisure based destination activities), beautification programs including the opening of blocked vistas to the water, formation of a Business Improvement District; to name only a few. Today, the downtown is significantly improved and the vacancy rate has dramatically declined to 3.4% as of the end of 2013.^{7, 8} The work to improve the downtown is continuing with an ever increasing amount of private investment fueling the redevelopment.

Village of Brightwaters

Significant development in Brightwaters began in 1907 when the T.B. Ackerson Company purchased a large estate and began a real estate development program that eventually encompassed about 1,300 acres. Lots were subdivided, roads and utilities were built and a large canal and marina was constructed from the Great South Bay to Montauk Highway, a distance of about 3,700 feet. The Brightwaters Canal, as it is known today, is a defining element of the community and a place of civic pride.

In 1916, this community was incorporated as the Village of Brightwaters. This act gave the Village authority for local roads, parks, land use (zoning), and sanitation, among other powers. However, a strong connection continued with Bay Shore with the sharing of such services as schools, library, and fire and rescue services. The Village form of government continues to the present day.

Starting in the 1950s, Brightwaters experienced the effects of the suburban expansion that occurred in western Suffolk County. New houses were constructed, especially in the northern portions of the Village. Today, the Village is almost completely developed.



Brightwaters Canal

Source: Jacobs



West Bay Shore

The early development of West Bay Shore included Sagtikos Manor, one of the oldest structures in the Town of Islip. Later development included Southward Ho Country Club, founded in 1923 with the purchase of 140 acres of the former Bossert Estate. The club continues today as a private golf course and country club north of Montauk Highway. The former Thorne Estate (constructed circa 1928), a site of about 200 acres, is now the Admiralty townhouse community, on the south side of Montauk Highway. Other parts of the Thorne Estate are wetlands currently owned and managed by New York State and The Nature Conservancy. Finally, at the western border of West Bay Shore, is Gardiner County Park, a large conservation area that extends from Montauk Highway to the Great South Bay and is a significant open space asset to the Community.

Most of West Bay Shore is made up of single-family detached dwellings constructed in the post-war period from 1950 through 1970, when the population of the Town of Islip increased from 70,000 to 278,000.⁹ Over the past 25 years, several attached-housing residential developments containing over 500 dwelling units have been constructed. Gardiner Manor Mall, a regional shopping center on the south side of Sunrise Highway was redeveloped approximately 14 years ago. This mall was upgraded to include big box retail stores such as Target and Old Navy.

West Bay Shore is served by the Bay Shore Union Free School District, Bay Shore - Brightwaters Public Library, the Bay Shore Brightwaters Rescue Ambulance company and the Bay Shore Fire Department.

Present Day

Bay Shore continued to grow after World War II when it became a bedroom community to New York City as a result of its access to major roadways and the LIRR. These characteristics of the Community are still attractive in the present day to residents wanting to live in a waterfront suburban community but also needing access to points west including New York City, about 40 miles to the west.

Greater Bay Shore is served by the Bay Shore Union Free School District, which maintains five elementary schools, one middle school, and one senior high school. Fire protection in Greater Bay Shore is provided by the Bay Shore Fire Department, headquartered at 195 5th Avenue with two additional substations in the



Gardiner County Park Serves as a major recreational resource for the Community.

Source: Jacobs



Bay Shore Marina Park, view of Robert Moses Causeway.

Source: Jacobs



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Community. This volunteer fire company dates back to the 1890s. The Community is also served by the Suffolk County Police Department's Third Precinct at 1630 5th Avenue in Bay Shore. Emergency medical services in the Community are provided by the Bay Shore Brightwaters Rescue Ambulance (BSBRA), a volunteer ambulance corps. The BSBRA service area is approximately 25 square miles and also encompasses Brightwaters and West Bay Shore. EMS aid to Fire Island is provided by the BSBRA via the ferries.¹⁰

Bay Shore is home to a Long Island Rail Road (LIRR) Station located along the LIRR's Montauk Branch. This branch offers service to points west to New York City and east to Montauk. The station, situated in the vicinity of Park Avenue and Oak Street, 3 blocks north of Main Street, is also a well utilized stop for visitors travelling to and from Fire Island via ferry. Bay Shore is a main hub for transportation to Fire Island via the Fire Island Ferries Terminal at 99 Maple Avenue. Ferry service is offered between Bay Shore and several Fire Island communities including: Ocean Beach, Ocean Bay Park, Fair Harbor, Kismet, Saltaire, Seaview, Dunewood, and Atlantique. The Point O' Woods Ferry Terminal, located at 82 Maple Avenue, is a private ferry operation providing service between Bay Shore and Point O' Woods for residents of Point O' Woods only. Maple Avenue is a critical evacuation route for Fire Island and is crucial in terms of access for emergency services, commerce and freight movement, as well as pedestrians walking between the Downtown area and train station to the waterfront and ferries.

A. Geographic Scope of the NYRCR Plan

The identification of a geographic scope for this NYRCR Plan was of paramount importance as it helped to develop parameters and inform the extent of the planning effort. This crucial responsibility was undertaken by the Committee. The geographic scope of the NYRCR Planning Area includes areas where assets are most at risk; where future construction or reconstruction of existing development should be encouraged or discouraged; or where key investment to improve the local economy can be implemented. Community assets are typically land uses, services, facilities or other features that are crucial to the day to day functioning of the Community. Community assets most likely to be at risk were typically located in extreme, high, and moderate risk areas of the Community.



Banner at the Dr. George S. King Park, Bay Shore.

Source: Jacobs



Greater Bay Shore NY Rising Community Reconstruction Plan

The NYRCR Greater Bay Shore Planning Area was shaped with feedback from the Committee and the public. Data from a variety of different sources was evaluated in determining the extent of the Community's NYRCR Planning Area. Source data included federal Census Designated Place (CDP) data, hazard assessment area information provided by the New York State Office of Emergency Management (NYS OEM), and the Federal Emergency Management Agency (FEMA) flood hazard boundaries, as well as inundation and elevation data. The Committee also indicated that the Village's geographic scope should be inclusive of locally identified significant assets such as the YMCA, the Main Street and the Business Improvement District boundary, the Bay Shore High School property, and waterfront area.

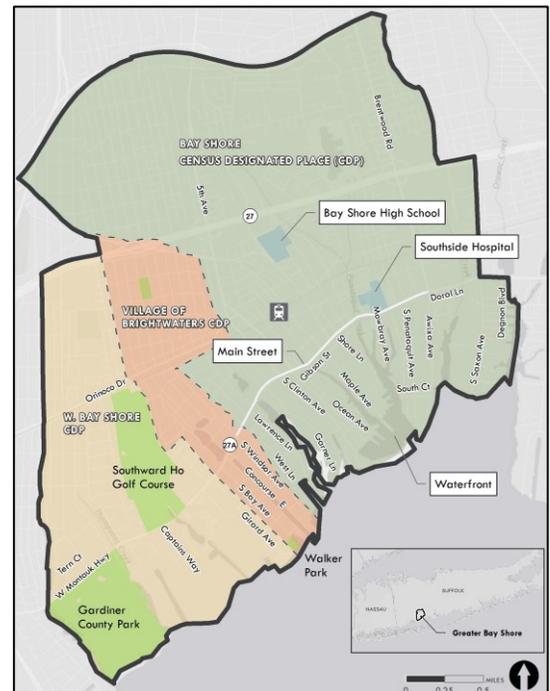
Initially, the geographic scope of the NYRCR Plan was defined by the Hamlet of Bay Shore's Census Designated Place boundary. After consideration of the geographic scope in the early stages of the planning process, the Committee determined that it would be appropriate to incorporate the Village of Brightwaters and West Bay Shore into the geographic scope of this Plan.

Therefore, the geographic scope of the Greater Bay Shore NYRCR Plan corresponds to the CDP boundaries of West Bay Shore and Bay Shore as well as the incorporated boundary of the Village of Brightwaters. Even though the northern areas of Greater Bay Shore did not sustain as much direct damage as a result of Superstorm Sandy, the Committee felt that the inter-relationship between discreet assets across the communities was sufficient justification to utilize the broader CDP/municipal boundaries as the Planning Area. Greater Bay Shore's NYRCR Community is inclusive of the area between West Islip to the west, North Bay Shore to the north, Islip to the east and the Great South Bay to the south.

More specifically, the NYRCR Community is bounded by the Southern State Parkway to the north and Hyman Avenue to the west. To the east, the geographic extent of the Planning Area is represented by a portion of Saxon Avenue from Sunrise Highway to Montauk Highway and the centerline of Orowoc Creek which also represents Bay Shore's eastern boundary.

Demographic and Socioeconomic Overview

The demographic overview provides U.S. Census data on the composition and general characteristics of the Greater Bay Shore NYRCR Community which is comprised of two census designated



Greater Bay Shore Geographic Scope (encompassing West Bay Shore, the Village of Brightwaters, and Bay Shore).

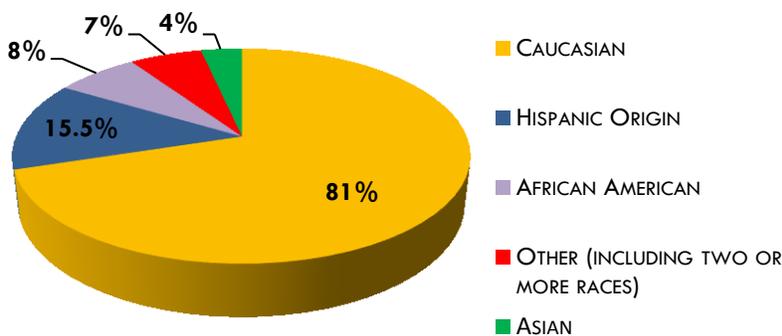


Greater Bay Shore NY Rising Community Reconstruction Plan

places (West Bay Shore and Bay Shore) and the Incorporated Village of Brightwaters. The summary table below provides a demographic and socioeconomic overview by CDP and the Village.¹¹

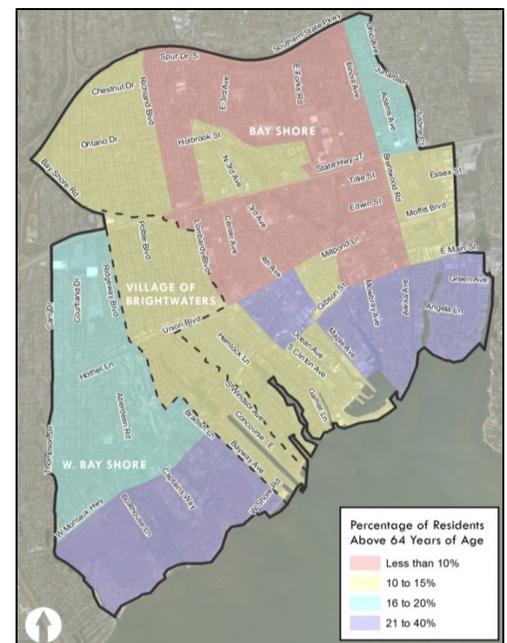
	West Bay Shore	Village of Brightwaters	Bay Shore
Population	4,676	3,122	27,887
Median Age	45.9	40.9	37.7
Housing Units	1,801	1,047	9,821
Percentage of Attached Housing	32.3%	0.4%	5.6%
Percentage of 20 or more units	-	0.7%	8.8%
Median Household Income	\$97,119	\$118,393	\$65,925
Poverty	1.3%	4.2%	7.1%

For the purposes of this overview, it was the Committee’s desire to group the CDPs and Village collectively as Greater Bay Shore. The Planning Area has a total population of 35,685 residents and 12,669 housing units as of the 2010 Census. The racial and ethnic composition of Greater Bay Shore is shown below:



The median age in the Community is 41.5 years. About 20% of the Greater Bay Shore population is under the age of 18 with 46.5% of the population age 65 or older. The Atria Bay Shore at 53 Ocean Avenue is a senior living community and memory care facility that can accommodate up to 150 residents.¹² In West Bay Shore, south of Montauk Highway, 40% of the residents are over 65 years old. Similarly, about 23% of the residents living in the area south of Montauk Highway between Maple Avenue and Orowoc Creek are over 65 years of age.

Data projections provided by Environmental Systems Research Institute (ESRI) indicate that the number of persons in Greater Bay

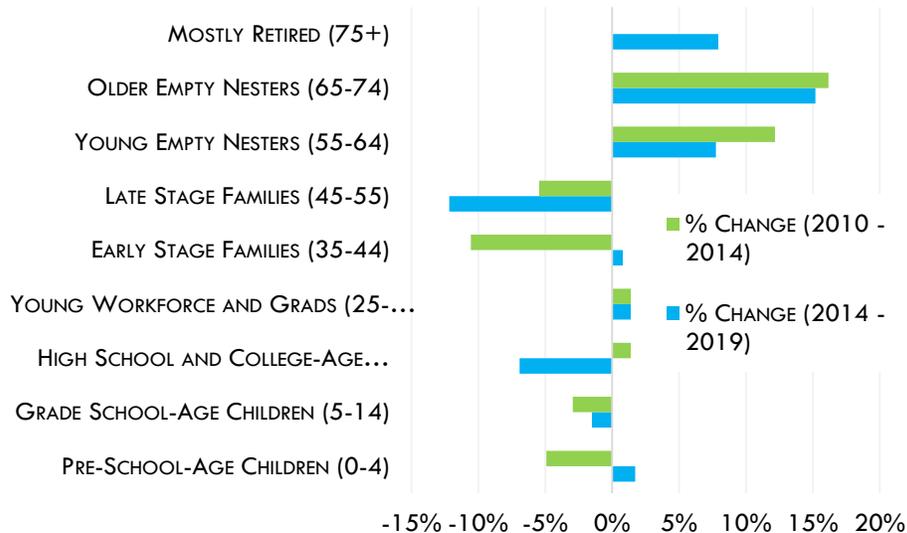


Greater Bay Shore, Residents 65 Years of Age or Older



Greater Bay Shore NY Rising Community Reconstruction Plan

Shore aged 55 and older will continue to rise (as baby boomers age), while young family households will continue to decline. The age of residents is a significant consideration for emergency management planners, as both senior residents and youth have particular needs and requirements for evacuation, response, and sheltering that must be accommodated.



Income and Poverty

Median household income in Greater Bay Shore ranged from a high of \$118,393 in the Village of Brightwaters to \$65,925 in Bay Shore. The median household income levels in Greater Bay Shore were higher than that of the State (\$57,683). In Bay Shore alone, approximately 7.1% were living below the poverty level. In Greater Bay Shore, there have been proactive approaches to help assist those in need. The Hospitality Center at St. Patrick's provides a food pantry and lunchtime meal as well as referrals and advocacy services. The Hospitality Center has been used as a national and regional model for social service outreach to vulnerable populations. This inclusive and community-centric approach to the provision of social services is a key element to be built on during this process.

The Greater Bay Shore Community includes three census tracts where more than 50% of the households are occupied by residents of Low-Moderate Income (LMI).¹³ Low-Moderate Income is defined as an amount up to 80% of the median family income in the area. With a current median family income of \$105,100 for a family of four, the LMI level would be \$84,100. For a family of two people, the amount would be \$67,250.¹⁴

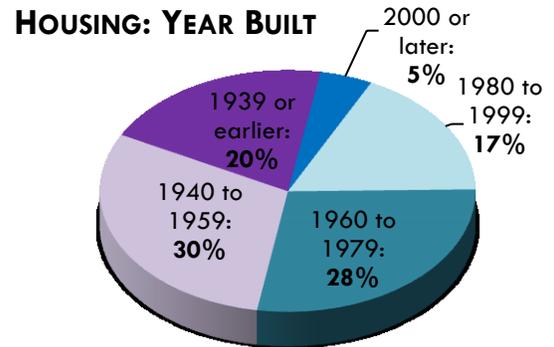


Housing Characteristics

In Greater Bay Shore, housing data indicated that there were almost 12,700 total housing units with a 95% occupancy rate. While single-unit detached housing comprises the majority of the housing stock (65%), a significant percentage (34%) is composed of townhouse-style or multi-unit structures. In addition, 165 manufactured housing units are located in the Bay Shore Mobile Home Park along Sunrise Highway. Home ownership rates approach 60% in Bay Shore with significantly higher home ownership rates in West Bay Shore (88.4%) and in Brightwaters (95%).

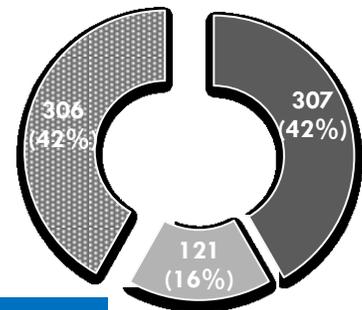
Based on U.S. Census data, 50% of the housing stock within Greater Bay Shore was built prior to 1960. In Brightwaters, 44% of the housing stock was built in 1939 or earlier (461 homes). Generally speaking, the older the housing stock, the more likely it is to be in need of renovations, and the less likely it is to be constructed to today's wind and flood resistance standards.

The Suffolk County Department of Planning's database of *Senior Citizen Multi-Unit Housing Complexes* indicates that there are 11 senior citizen housing complexes with a total of 734 units (see breakdown of housing type at right). A list of senior housing complexes is provided below.¹⁵



ELDERLY HOUSING UNITS

■ APARTMENT ■ CONDOMINIUM ■ SENIOR APARTMENTS



Name	Year Opened	Units
Apartment		
Brook Gardens	1984	96
Fairfield Renaissance	1998	14
Oakwood Manor	1997	120
Saxon Green	1997	76
Apartment Subtotal		306
Condominium		
Windcrest on the Lake	1997	43
Da Vinci Townhomes	2009	18
Mystic Pines (Senior Part)	2005	60
Condominium Subtotal		121
Senior Apartments		
Bay Towne Village (Senior Part)	1982	144
Hemlock Green	1991	13
Penataquit Village	1971	134
South Wind Village (Senior Part)	2001	16
Senior Apartment Subtotal		307
Total		734



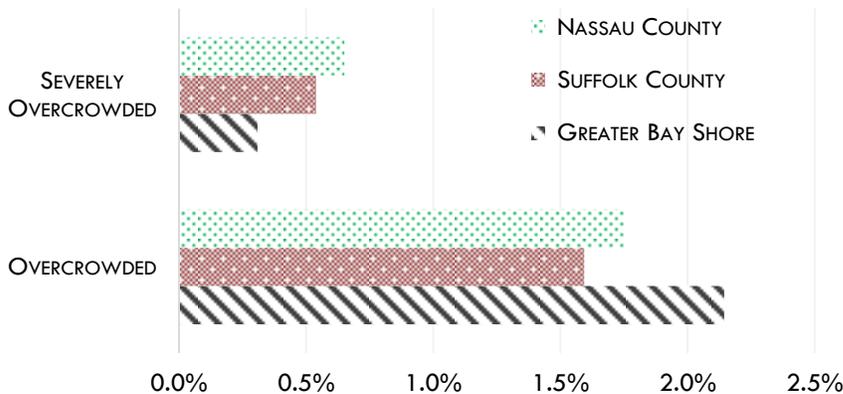
Housing Values

According to Multiple Listing Service (MLS) data provided by the Suffolk County Planning Department, the average median home prices in the region rose throughout the first six years of the decade, peaking at \$398,600 in western Suffolk County in 2006, just before the recession. From 2006 to 2013, the average median home sale prices dropped by 24% in western Suffolk County, but have more or less stabilized since 2011. According to the 2008-2012 American Community Survey, the average median value of owner-occupied housing in the Greater Bay Shore area was estimated to be \$435,700, \$40,500 higher than the average median value of owner-occupied housing in Suffolk County (\$395,200).

While average home value and median listing price within Greater Bay Shore vary by location, homes along the shore have higher overall average values and median list prices. While the value of homes in these areas have traditionally been high due to their proximity to the water, the flood risk attribute to homes near the coast and the increasing cost of homeowners insurance have likely suppressed the value of these homes in recent years.

Overcrowding

The U.S. Department of Housing and Urban Development (HUD) defines overcrowding as more than one person per room. Of the almost 12,000 occupied housing units in Greater Bay Shore, 2.1% (257 units) were overcrowded (1.01 to 1.5 persons per room) and 0.3% (37 units) was severely overcrowded (more than 1.5 persons per room).





Cost Burdened Households

A significant indicator of housing affordability is the percentage of renters paying more than 30% of household income by census tract, considered cost burdened according to HUD. Renters spending more than 50% of their income on housing are considered severely cost burdened. Cost burden is the ratio of housing costs to household income. For renters, housing cost is equal to gross rent (contract rent plus utilities). Housing cost for home owners typically includes mortgage payment, utilities, association fees, insurance, and real estate taxes.

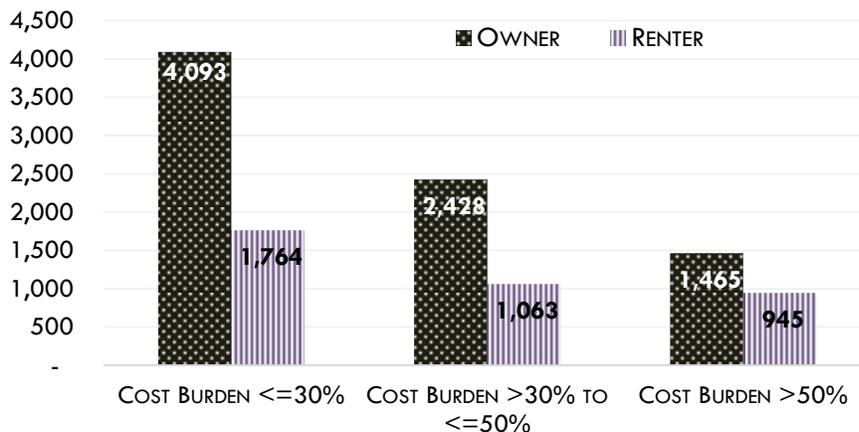
According to 2007-2011 Comprehensive Housing Affordability Strategy (CHAS) data, in the Greater Bay Shore area, 51% of homeowners, and 46% of renters are spending less than 30% of their household incomes for housing costs.¹⁶

Cost Burdened

- 30% of homeowners (2,428)
- 28% of renters (1,063)

Severely Cost Burdened

- 18% of homeowners (1,465)
- 25% of renters (945)



Employment and Journey to Work

The Greater Bay Shore Community relies heavily on the automobile as the majority of workers (83%) commute by car. Mean travel time to work is roughly 31 minutes. The educational services, health-care, and social assistance sector employs the greatest percentage of residents (almost 27%). Other significant employment sectors



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include retail trade (18%), construction (11%), and professional, scientific, and technical services (6.8%).

Greater Bay Shore's walkable downtown area features a mix of well-established, family-owned businesses, newer eateries and shops, as well as LIJ Southside Hospital and associated medical and health care-related operations. This 341-bed hospital is a major employer within the Community, which, with its assorted outpatient, medical and administrative offices, forms a "medical corridor" along Main Street/Montauk Highway in the vicinity of the hospital. In addition, Good Samaritan Hospital is located 3.6 miles to the west in West Islip. Another major employer in Greater Bay Shore is USA Industries, founded in the mid-1980s. This business has transitioned from a locally-significant automotive business to a worldwide distributor of auto parts, employing a staff of about 300.¹⁷ However, this business, recently acquired by Remy International, Inc., will be closing in November 2014 resulting in a loss of 271 jobs.¹⁸

Perhaps the most well-known business in Bay Shore is Entenmann's which grew from a small Main Street bakery over 100 years ago to a national brand. At its height, Entenmann's was the area's largest employer with over 2,300 workers and a source of regional pride.¹⁹ While production at their 5-acre bakery complex on Fifth Avenue ceased in July 2014, 87 of 265 workers were retained for marketing, research and distribution functions. The bakery complex is located on the north side of the Southern State Parkway, beyond the limits of the Planning Area. Future plans for the reuse of the Entenmann's site are unknown at this time.



Main Street in Bay Shore is the critical east-west road within the Community.

Source: Jacobs



Entenmann's, a Bay Shore Institution.

Source: Jacobs

B. Description of Storm Damage

After passing through the Caribbean -- including Jamaica, Cuba and the Bahamas -- and fluctuating between a Category 1 and Category 2 Hurricane, Sandy turned north toward the US coast on Saturday, October 27, 2012. The storm made landfall near Atlantic City, NJ, around 8 PM on Monday, October 29. The winds had decreased to just below the threshold for a Category 1 Hurricane and meteorologists and the press christened this near hurricane as "Superstorm Sandy."

Superstorm Sandy's historically unprecedented path approached New Jersey and New York from the east; storms typically approach from the south. As a result, the track of Superstorm Sandy resulted



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in a worst-case scenario for storm surge and inundation in coastal regions from New Jersey north to Connecticut including New York City and Long Island. The storm surge came ashore near the time of high tide along the Atlantic Coast and during a full moon when tides are strongest. These factors combined for record tide levels. The storm surge in New York Harbor reached almost 14 feet at the Battery. Forty-two miles away, on the South Shore of Suffolk County, Bay Shore was inundated with an estimated 3.4 feet of water on top of the morning tide that had already inundated the bay front shore and had yet to retreat.²⁰

In addition to the threat of the enormous storm surge, the coinciding high tide and the full moon, other factors conspired to create the devastation that resulted from Superstorm Sandy. Nearby, at Long Island MacArthur Airport sustained winds reached 56 mph (49 knots) with gusts to 90 mph (78 knots). On the southward facing shores of Long Island, the storm surge was accompanied by fiercely destructive wave action. An off-shore buoy located 15-nautical miles southeast of Breezy Point on the Rockaway Peninsula reported a wave height of 32.5 feet (the largest since record keeping began) On October 29, 2012, sweeping out of the darkened skies with unexpected speed and savagery, Superstorm Sandy put every bit of the Community's toughness and caring to the test.

In Greater Bay Shore, a number of the homes and side streets south of Montauk Highway were inundated with over three feet of water.²¹ Along the Great South Bay, the creeks and canals, bulkheading and the homes behind them were damaged by boats, debris, and floating docks that had broken free of their moorings. The Bay Shore Fire Department (BSFD) had mobilized in the days ahead of Superstorm Sandy's landfall with advance planning meetings and equipment preparation. Even so, the Department was overwhelmed with hundreds of calls for emergency assistance with the earliest received mid-day on October 29th. The BSFD's Dive Team used inflatables to rescue trapped residents south of Montauk Highway, on Shore Lane, Maple and South Clinton Avenues. During and in the days immediately after the storm, the BSFD braved dangerous conditions to respond to structure fires, live, burning and downed wires, flooding conditions and fallen trees.

In the weeks following the storm the Bay Shore Fire Department Headquarters at 195 5th Avenue was used as a public safety response area, an Island Harvest distribution point and a donation



During Superstorm Sandy the BSFD's Dive Team used inflatables to rescue stranded residents.

Source: Bay Shore Fire Department



Damaged residence at the corner of Girard Avenue and Neptune Court (West Bay Shore).

Source: Jacobs



Greater Bay Shore NY Rising Community Reconstruction Plan

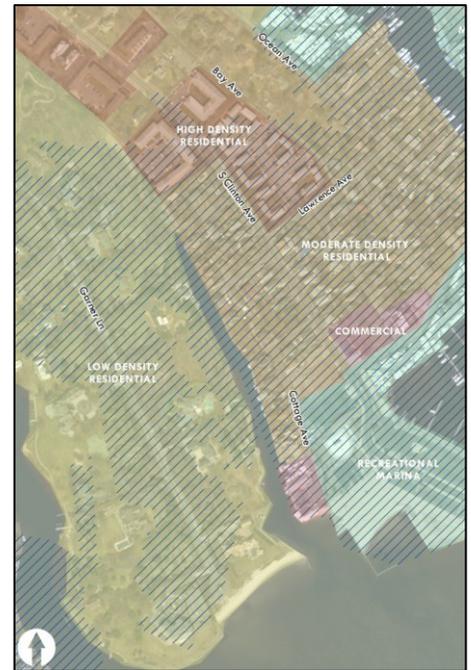
collection center. The Red Cross also used the Fire Department as a base and dozens of out-of-state utility workers were housed in the facility for several days. The BSFD's reach was felt on a regional scale as well when their members traveled east in November 2012 to assist a number of Nassau County fire departments in providing adequate protection to their communities.²²

Superstorm Sandy's storm surge significantly impacted the Community and affected the entire coastal frontage of Greater Bay Shore (described from west to east). Trues Creek, on the boundary between West Bay Shore and West Islip, experienced flooding that extended north of Montauk Highway to the rear of homes along Tern Court. In West Bay Shore, Gardner County Park and the wetlands adjacent to the Admiralty and Sunscape developments were completely inundated and served an important role as a storm surge buffer. Shore Road, Walker Park, Gilbert Park and the Concourse in Brightwaters were all inundated as a result of the storm surge.

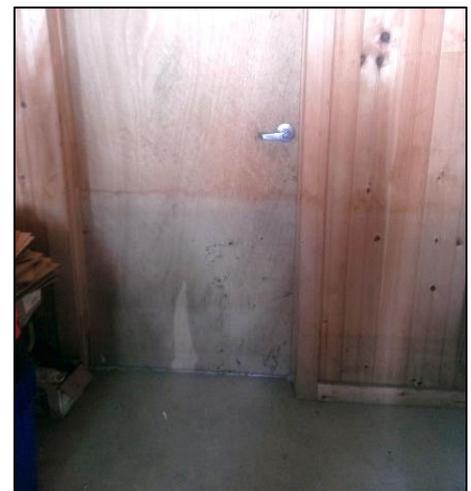
Flooding from the marina area extended north along South Bay Avenue, Bay Way Avenue and east to South Windsor Avenue on the east side of the Village. This flooding extended into the O-Co'nee neighborhood of Bay Shore including portions of West Lane, Lawrence Lane, and Garner Lane.

The neighborhood bounded by South Clinton Avenue and Ocean Avenue was inundated with salt water from the bay and adjoining canals with Auburn, Burnett, and Bay View Avenues hit particularly hard. This area includes many moderate income single-family homes, small bungalows, as well as multi-family apartment buildings. This neighborhood abuts the Community's waterfront area with many commercial uses (e.g., restaurants, marinas, and boat yards) and regionally significant public recreational facilities like the Bay Shore Marina. This 500-slip marina is also a regional recreational asset with two boat launch ramps, a boardwalk, a playground and Benjamin Beach. A spray park called Shipwreck Cove is also located at the Marina.²³

Maple Avenue, the access route to the primary ferry terminal to Fire Island, was flooded for approximately one-half mile landward of the Bay. Water from the Bay rushed into the Point O' Woods Ferry Terminal, flooding the office with almost four feet of water. Today, the high water line is still visible in the office. While flooding occurred in the Community's vulnerable coastal areas, areas north



The area between Garner Lane and Ocean Avenue has a mix of housing (apartments, bungalows and larger detached single-family homes) all of which experienced flooding from the storm.



High Water Mark at Point O' Woods Ferry Terminal Office.

Source: Jacobs



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of Montauk Highway in the vicinity of Homan Avenue were also inundated from the overflow of local creeks and canals during Superstorm Sandy. Homan Avenue is situated immediately west of LIJ Southside Hospital, a vital tertiary-level regional health facility. Access to the hospital was compromised by this flooding.

Both Penataquit Point and Awixa Point, two residentially developed neighborhoods in the eastern portion of Greater Bay Shore, experienced flooding, as did properties lining both sides of Orowoc Creek, the boundary between the Hamlet of Bay Shore and Islip. Many residential and marine commercial uses were affected by the storm-related inundation in this area. Roadways became impassible, the storm drainage system was overwhelmed, and homes were inundated.

While Greater Bay Shore experienced damage to private property as a result of Superstorm Sandy, municipal facilities did not go unscathed. Roof damage was sustained by two buildings at the Town of Islip's Department of Public Works' (DPW) 2nd Avenue Highway Yard at 142 Second Street. Greater Bay Shore also experienced damage to traffic and street lights as well as to curbs and sidewalks.²⁴ The Town of Islip DPW removed extensive amounts of debris from throughout the Community.²⁵

In Brightwaters, immediately after the storm, the Village's Public Works Department worked to clear roads of debris and used wood chippers to remove downed trees.²⁶ Neighbors helped each other and businesses in the Village were a vital part of the recovery effort. The beer distributor in the Village gave out free ice to those without power. At Brightwaters Hardware, even though there was no electricity, the owner, opened up his business because residents were in need of supplies to help in the clean-up.²⁷ Local volunteers gathered to clean up Gilbert Park.

In the wake of Superstorm Sandy, Islip's Town Board commissioned a comprehensive Town-wide assessment of damage to the area so as to better understand the level of effort required to rebuild the Community. This damage assessment identified more than \$25 million in project costs directly related to Sandy with regards to Islip's parks, marinas, and recreational facilities.

Bay Shore Marina on South Clinton Avenue and Ocean Avenue Dock sustained a wide array of damage. Storm damage at Bay Shore Marina included uprooted playground fencing, and destroyed



Water levels remained high in Greater Bay Shore's creeks and canals post-Sandy.

Source: Greater Bay Shore NYRCR Planning Committee



Downed trees during Superstorm Sandy resulted in personal property damage throughout the Community.

Source: Greater Bay Shore NYRCR Planning Committee



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sidewalks, along with a large section of the parking lot (requiring 220,000 square feet of new pavement). Additionally, drainage pipes and outfalls in this area were blocked with storm-related debris resulting in the need for emergency maintenance as well as the collapse of a number of outfall pipes. Almost 3,000 cubic yards of sand eroded from the public portions of the beach and 70 linear feet of bulkhead was compromised in central parts of this publicly-owned marina.²⁸ Storm-related damage also required general maintenance, parking lot repairs, the repair of electrical and water systems and dredging at Ocean Avenue Dock.

The marinas and docks on Ocean Avenue and South Clinton Avenue are crucial community assets as they function as a lifeline for the communities on Fire Island, both as a jump-off point for residents and employees and as distribution points for goods needed on the barrier island.²⁹

In advance of the storm, thriving waterfront establishments such as Captain Bill's, Swept Away (formerly Cool Water Grill), Molly Malone's and Fatfish took precautions like sandbagging entrances and boarding up windows. Still, many of these restaurants were severely compromised by the winds and flooding resulting from Superstorm Sandy. With the help of their staff and the Community, Captain Bill's at 122 Ocean Avenue was re-built, reopening the day after Thanksgiving 2012. While Molly Malone's on Maple Avenue sustained extensive damage, it was eventually rebuilt as well.



Superstorm Sandy resulted in wind and water damage to property throughout Greater Bay Shore.

Source: Greater Bay Shore NYRCR Planning Committee

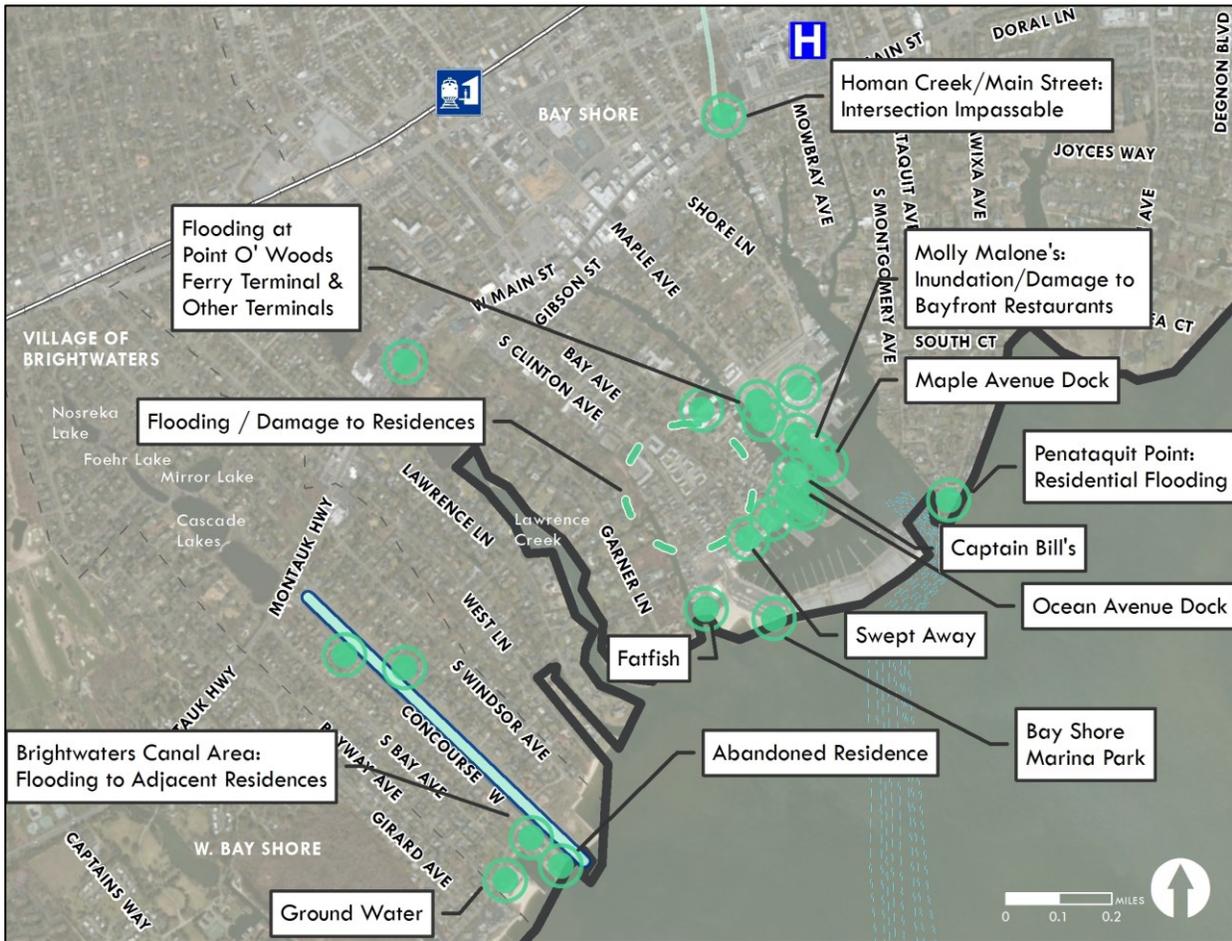


Figure 1. Superstorm Sandy-Related Damage
Identified by the Committee During a Community Tour on July 3, 2014.

C. Critical Issues

Through the Committee process, as well as Public Engagement Events, critical issues related to Greater Bay Shore's recovery from Superstorm Sandy as well as future resiliency needs were identified. These issues framed the Committee's efforts to define needs, opportunities, strategies and projects that would make Greater Bay Shore a more resilient and sustainable community. Critical issues included:

- **Repetitive and severe flooding.** Many locations in the Community are subject to chronic flooding as a result of tidal surges, heavy rain storms and extreme high tides. In some



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cases, the flooding can be severe as occurred with Superstorm Sandy when neighborhoods south of Montauk Highway experienced inundation levels extending for thousands of feet inland from the bay. Flooding also occurred in some locations north of Montauk Highway along stream corridors. Such flooding impaired road access to properties vital for both emergency access and evacuation. The flooding resulted in property damage to buildings, roadways, landscaping and other improvements. In the case of commercial uses, flooding hindered or prevented business operations with the resultant loss of local economic activity including a reduction in work hours for employees and a diminution of tax revenues for some government jurisdictions.

- **Extended recovery time for basic services.** The potable water system remained operational and the sanitary sewer system experienced only limited disturbance during and following Superstorm Sandy. However, the return of other basic services (specifically electric, gas, internet, telephone) took from a few days to a couple of weeks following Superstorm Sandy - for structures that were in otherwise sound condition. This situation has occurred with many severe weather events in the past including hurricanes, nor'easters and ice storms. It greatly affects the community and hinders what would otherwise be a return to normalcy. It can have a particularly severe impact on vulnerable populations including the elderly and those dependent on electrically powered medical equipment. Other basic services that are important to post-storm recovery are the availability of gasoline and diesel fuel and the clearing of debris and silt on roadways.
- **Resiliency of ferry terminals/marina.** Bay Shore is the primary terminal for public and private passenger and freight service to Fire Island and functions as a regional asset. Fire Island is a national park that contains 17 communities that do not have paved roads and allow only the limited use of vehicles. The largest portion of the population is located in the western part of Fire Island which is served by the Bay Shore ferry terminals. This includes a seasonal population of more than 6,000 residents that is supplemented with a substantial population of daytime visitors.³⁰ The evacuation of the Island in advance of major storms, and sometimes during a storm event is a significant matter of public safety. The terminal is also used at times to get emergency services to the Island as well as critical



The Ferry Terminal and Marina serve as a lifeline to Fire Island and play a major Role in the resiliency of the local economy.

Source: Jacobs



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supplies. This function was severely impeded by flooding during Sandy as was access to these areas along crucial evacuation routes.

- **Presence of vulnerable population.** There are people in every community that are particularly vulnerable to the strains and hardships associated with a major storm and the recovery period. These include individuals with disabilities, low and very-low income, elderly, young children, homeless and people at risk of becoming homeless. Bay Shore has a proud history of social responsibility through its Community Based Organizations and the needs of this vulnerable population during and after storms is of ongoing concern. For example, the care of frail, elderly residents may be particularly challenging if they do not fully comprehend the danger of a storm or are not able to react without assistance.
- **Communications and educational outreach before, during and after storms.** The need for accurate information to plan for, withstand and recover from storms is critical to the Community's well-being. This is especially important for vulnerable populations and those with English as a Second Language (ESL).
- **Maintaining critical services and access at Long Island Jewish (LIJ) Southside Hospital.** LIJ Southside Hospital is a regional health care facility located at the eastern edge of Downtown Bay Shore. It serves the southwestern portions of Suffolk County, one of the most densely populated regions of the county. The hospital has 341 beds and is one of only five tertiary level facilities operated as part of the North Shore/Long Island Jewish health care system. It offers a full range of general and specialized services including emergency care. The hospital is also an important part of the local economy. The hospital and the Committee have indicated that adjacent roadway flooding and the potential for flooding at their facility are major concerns.
- **Water quality.** The Town of Islip's Great Cove Watershed Study, completed in 2012, identified water pollution as the cause of deteriorating water quality in Great Cove and within the streams and creeks that drain to the Cove and the Great South Bay. According to the study, stormwater runoff was identified as a leading source for discharge of pollutants into these surface



LIJ Southside Hospital serves as a major employer and is the regional trauma center for a large part of the South Shore.

Source: Jacobs



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waters. “Sediment, trash, road salts, oils, heavy metals and other chemicals from vehicles, pesticides and nutrients from lawns, bacteria and nutrients from pet waste and failing septic systems and sewer system leaks or overflows are all pollutants of concern that are transported into surface waters by stormwater runoff.”³¹ In addition to water quality concerns, the Community has also expressed concern for streams and creeks that have become overgrown and silted. This affects the capacity of natural waterways to collect, store, filter and discharge water into the Bay.

- **Continued recovery of the local economy including Downtown Bay Shore.** A critical issue to the Community is the continued recovery of Downtown Bay Shore as the anchor of the local economy as well as other concentrations of economic activity in the Community. The downtown has had a remarkable renaissance in the past two decades and this success has reflected well on the Greater Bay Shore community. It has created a positive image both within and outside of the Community. The improvement has not been limited to the downtown. Neighborhoods have been upgraded (e.g., South Wind Village, Sunnybrook), the type of uses along Main Street has diversified (e.g., more restaurants, the Boulton Center), the health related industry has grown and housing has been provided in and around the downtown. Continued diversification of land uses within the downtown along with improved transportation, communications, and power networks may improve the resilience of the local economy in the face of closures, shipping and distribution delays, as well as other disruptions that tend to occur after severe weather events.



Main Street in Bay Shore.

Source: Jacobs

D. Community Vision

The development of a Community Vision Statement was a key initial step for the Greater Bay Shore NYRCR Committee. The Committee crafted a statement that reflected the community’s unique assets, values, and desire for a resilient future. As the Committee advanced through the NYRCR planning process, the Vision Statement was the touchstone against which strategies and resiliency projects were compared to ensure that any recommended actions were consistent with the Community’s desired future.

Committee members were asked to answer three key questions in order to help build towards the drafting of the Vision Statement:



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- What is unique and/or central to your definition of Greater Bay Shore?
- What are the predominant community values you wish to express?
- What are the features of a safer and more resilient Greater Bay Shore in the future?

The Committee was asked to suggest ideas, words and phrases that illustrated their Community's livability, uniqueness and appeal, aspects that could be improved, and those that should be preserved. Based on the Committee's work as well as input received through the public engagement process, the Vision Statement, at right, has been adopted:

Based on this Vision Statement and the discussions held during its drafting, a series of goals for Greater Bay Shore were identified by the Committee:

- Protect the safety and quality of life of residents, employees and visitors to the community from natural hazards and emergency events;
- Minimize damage caused by future natural disasters;
- Make the communities more resilient to climate change and associated future storms;
- Improve stormwater drainage systems to better drain areas during times of heavy rain and to reduce opportunities for the system to act as a conduit for flood water from the Bay during storm events and high tides;
- Maintain natural ecosystems and improve stormwater management;
- Reduce impermeable surfaces in the built environment through use of eco-sensitive design, methods and technologies;
- Maintain and improve the economic resiliency of the Main Street business district;
- Support the marina economy that is crucial to Fire Island and so essential to Greater Bay Shore's economic health;
- Provide and enhance physical, economic, and visual connections between Main Street and the waterfront;
- Enhance the resiliency of existing facilities situated outside of flood zones (i.e., YMCA, Bay Shore High School) that support recovery activities;
- Protect vulnerable populations, particularly the elderly and individuals with disabilities, before, during, and after emergencies;

VISION STATEMENT

Picturesque Greater Bay Shore, including the mile-square Village of Brightwaters, is the heart of Long Island's South Shore. With the Great South Bay as our backyard, we are the gateway to the National Seashore, a lifeline to Fire Island, and serve over one million visitors each year. The economic vitality of our historic downtown and the nearby marinas, docks and ferry services are crucial to our identity and future well-being. We are proactively pursuing a future that supports a resilient and sustainable economy while also reducing damage from future storm events and strengthening our ability to recover from these events. Greater Bay Shore is a caring, culturally diverse community, united in spirit, purpose, and values.



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- Provide for better communications prior to, during, and after emergency events especially for English as a Second Language (ESL) and other vulnerable populations;
- Ensure a clear, flood free evacuation route from the ferry terminals through Bay Shore to the LIRR Station;
- Support medical/hospital-related uses and protect emergency access routes, power supply and communications from flooding and associated damage;
- Protect sanitary sewerage and stormwater pump stations located in inundation areas and ensure that the power supply is uninterrupted to these facilities; and
- Maintain a continuous power supply to the Islip Town DPW Yard to ensure uninterrupted fueling for both Town of Islip and Fire Island emergency vehicles.

E. Relationship to Regional Plans

In order to better understand the planning environment and the work done to date within Greater Bay Shore, it was paramount to understand the context and interrelationship between local and regional issues.

Review of Relevant Existing Plans and Studies

The following plans were identified and reviewed as part of the planning effort related to the Greater Bay Shore's NYRCR Plan. The reviewed plans, described below, formed the initial basis for an overall understanding of the existing conditions as well as the desired future conditions within the Community.

There have been many plans and studies prepared at the local, county and regional levels that encompass the communities of Greater Bay Shore. Local level, specific plans can have a direct effect on the day-to-day lives of residents and the future of their communities. Regional level, broad findings, policies and programs focused on the well-being of larger geographic areas must also be considered in the development of a comprehensive NYRCR Plan. The following is a review of the plans and studies that are relevant to the NYRCR Plan for Greater Bay Shore.

Local Plans and Studies

Town of Islip Comprehensive Plan, Volume 7A—Community Identity Series, Town of Islip Department of Planning and Development, 1976. This series provided individual plans for each



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of the hamlets located within the Town of Islip. The Bay Shore Community Identity study included the hamlet of West Bay Shore but did not include the Village of Brightwaters (the Village is not subject to the planning authority of the Town). The plan addressed local issues including the decline of the downtown business district and the need for a diversification of the local economy. A program for revitalization was prepared which included infrastructure development (parking, access roads, and sewers), storefront façade and streetscape improvements, the expansion of opportunities to open up underutilized waterways to public access, and a program of zoning incentives to encourage the development of higher density housing and mixed uses. The plan was the first action by the Town of Islip to reverse the decline of the Community and was a precursor to Federal and State grants that helped to fund the change that began happening at this time. Although the study is several decades old, it served as the starting point for the recovery of downtown Bay Shore which is on-going today.

Town of Islip Comprehensive Plan Update # 1, Town of Islip Department of Planning and Development, 2011. This Town-wide update to the Comprehensive Plan included a review of the (1976) original goals of the Town's Comprehensive Plan. It also addressed the demographic changes that had occurred since the original plan was completed with a focus on population, ethnicity and housing. Some relevant findings provided by a comparison of US Census data between 2000 and 2010 included:

- The population of the Town grew at a modest rate of about 1,400 persons a year, most of which was due to population increases in Brentwood. Bay Shore averaged about 200 new residents a year. The population growth in Bay Shore (CDP) was about 10% over the decade. The growth for the Town of Islip over the same period was about 4%.
- The population of the Town is aging. The number of residents under the age of 40 decreased by about 12,000 while the number of people over the age of 40 increased by more than 25,000.
- Bay Shore is becoming more diverse with an increase in the percentage of residents of Hispanic descent from almost 20% in 2000 to almost 31% in 2010.



Town of Islip All Hazard Mitigation Plan, Town of Islip Department of Public Safety 2014. The purpose of this plan was to identify all of the Town's natural, human and technological hazards; to review and assess post disaster occurrences, estimate the probability of future occurrences, identify vulnerability, set goals to reduce potential impacts and recommend a prioritized list of solutions. Potential solutions identified in the draft All Hazard Mitigation Plan include: emergency response education, installation of permanent generators at critical facilities, and the acquisition of high water vehicles to provide assistance and rescue during periods of limited access. These solutions are largely consistent with the recommendations made by the Committee. This plan has been submitted to FEMA for review and acceptance. The plan will replace the prior All Hazard Mitigation plan approved in 2008.

Great Cove Watershed Management Plan, Town of Islip and the New York State Department of State, September, 2012. The Great Cove Watershed Management Plan encompassed a geographic area that extends, approximately, from the Robert Moses Causeway in West Islip to Heckscher State Park in East Islip. Great Cove is the portion of the Great South Bay adjacent to this land area. The study focused on the stormwater drainage contributing area to Great Cove and included nine major creeks including the following within the Greater Bay Shore Community (from west to east): Trues Creek, Thompson's Creek, Lawrence Creek, Watchogue Creek, Penataquit Creek and Awixa Creek. Major canals within this same area include Hyde Canal, Southward Ho/Thorne Canal, and Brightwaters Canal. The purpose of the study was to provide a description and understanding of the existing natural, cultural and human resources within the watershed, to identify the condition of those resources as they affect the watershed and to provide recommended implementation strategies to achieve watershed and water quality improvements.

County Plans and Studies

Suffolk County Comprehensive Plan 2035, Suffolk County Planning Commission, 2011. This report was issued as the first volume of a series that will cover all aspects of the Suffolk County environment, economy, sustainability and resource protection. The report presents updated information on demographics and socio-economic data, and development trends, as well as a summary of existing regional and local plans. As subsequent volumes of the plan are prepared, both Bay Shore and Brightwaters are potentially affected by the recommendations of the plan as it involves such matters as



County roads, drainage, downtown revitalization and regional development policies.

Suffolk County Demographic, Economic and Development Trends, Suffolk County Department of Planning, 2008, with periodic, unpublished updates. This report provides information on demographic, socioeconomic and development trends for both Suffolk County and, in some cases, Nassau County as well. The report is updated periodically with the most recent occurring in May 2014. The report found that employment on Long Island has consistently increased since April 2010. Employment in education and health services was up 2.4% between March 2013 and March 2014. During this same period the overall unemployment rate in Suffolk County declined from 6.9% to 6.0%. In another positive sign, the number of businesses continues to rise modestly. As of the third quarter of 2013, there were 50,913 private business establishments located in Suffolk County. This represents an all-time high for the County and a 2.6% increase in the five years since 2008. These factors point to an improving regional economy.

Suffolk County Comprehensive Water Resources Management Plan, Suffolk County Department of Health Services (in progress); Executive Summary (January 2014). This is a very significant study for the purpose of updating a similar study in 1987, the antecedent of which was the Long Island 208 Study in 1978. The study includes the collection and testing of extensive groundwater samples as well as the mapping of land uses and build-out projections. The purpose of the study is to ascertain if the County is meeting water quality standards to ensure a safe drinking water supply. Since Suffolk County's 1.5 million residents rely on groundwater as their sole source of drinking water, the quality and quantity of this resource is critical. The study is also examining the impact of groundwater on surface water quality, which, in turn affects the health of wetlands—a factor in the mitigation of storm damage for many coastal communities. An executive summary of the report was prepared in January 2014. The release of the full report is pending.

The Executive Summary identified what it called, "The Nitrogen Bomb in our Bays." Increased levels of nutrients in the groundwater of Suffolk County has significantly degraded surface water quality and has resulted in a decrease in vegetated coastal features, such as wetlands and sea grass beds. These features are important for many reasons including the protection of coastal communities from storm damage.



Land Available for Development and Population Analysis Western Suffolk County, Suffolk County Planning Department, 2009. This study was a component of the County's Comprehensive Water Resources Management Plan, described above. The intent of the study was to determine the potential for population growth and future demand for drinking water. Within the Bay Shore Census Designated Place (CDP), it found that 80 acres of land were vacant and potentially available for development. This acreage consisted of 41 acres of residential-zoned land (lots of 6,000 square feet or greater), 25 acres of commercial-zoned land and 14 acres of industrial-zoned land. Within the Village of Brightwaters, five acres were identified as vacant and potentially available for development, all of which were residential lots of 6,000 square feet or more. In West Bay Shore, seven acres of vacant land were identified as potentially available for development consisting of five acres of residential-zoned land and two acres of industrial-zoned land. Although Bay Shore has a greater amount of available vacant land than the other two communities, it is likely that redevelopment of existing built properties will be a more significant factor in future development and economic growth within the entire Community.

Shopping Centers and Downtowns, Suffolk County, N.Y., Suffolk County Department of Planning, 2006. Since 1978, the Suffolk County Department of Planning has periodically surveyed the central business districts and shopping centers of the county. The surveys provide useful information on the health of these shopping centers over time. The 2006 study was updated by the department in 2010 at the height of the Great Recession which was one of the worst times for retail sales throughout the nation. For downtown Bay Shore, the 2010 update indicated 208 storefronts (retail and non-retail) with a vacancy rate of 21%. This compares to a vacancy rate of 42% in 1996. It is likely that vacancy rates have declined even further since 2010 as the economy has recovered. The highest vacancy rate for Downtown Bay Shore (42.3%) of the years surveyed by the County was in 1996. The County also conducted surveys in 1978 (15.2%), 1982 (11.2%), 1989 (22.4%), 2000 (18%), and 2005 (20.2%). Record high vacancy rates in Suffolk County existed in 1996 but none approached Bay Shore's rate of 42%. By comparison, vacancy rates in other large downtowns were Riverhead (27%), Patchogue (20%), Sayville (17%), Lindenhurst (13%) and Greenport (12%).³²



The Village of Brightwaters has a small business district located at Orinoco Drive and Windsor Avenue. The 2010 County study found an 8% vacancy rate at this location. West Bay Shore does not have a central business district.

Smart Growth Policy Plan for Suffolk County, Suffolk County Department of Planning, 2000. This report describes the Smart Growth planning process and also discusses eight Smart growth principles and how they can be implemented throughout the county.

Regional Plans and Studies

Suffolk County NY Rising Community Reconstruction (NYRCR) Plans, March 2014. NY Rising Community Reconstruction Plans for 21 Communities across Long Island were completed during Round I of the NYRCR Program. Eight of these Round I Communities are located along Suffolk County's South Shore, which was hit particularly hard by Superstorm Sandy. These eight Communities are spread across three towns and four villages within Suffolk County and include (from west to east):

- Village of Amityville/Copiague;
- Village of Lindenhurst;
- Village of Babylon/West Babylon;
- West Islip;
- West Gilgo to Captree;
- Fire Island;
- Oakdale/West Sayville; and
- Village of Mastic Beach/Smith Point of Shirley

Collectively, the Round I NYRCR Plans and their recommended projects reflect the resiliency needs of the South Shore. Some of the key considerations noted in these plans are identified below.

A critical issue for the Village of Amityville/Copiague NYRCR Community was to ensure that emergency access was maintained in the Community. The existing East and West Riviera Drive bridges are the only means of vehicular access to the American Venice neighborhood. These bridges are load rated to 12 tons which prohibited the use of certain heavy rescue and emergency vehicles during Superstorm Sandy and also delayed post-storm assistance. Improvements to these bridges would reduce vulnerability by ensuring access to roughly 600 residences in the American Venice area of Copiague. While Greater Bay Shore was largely spared from



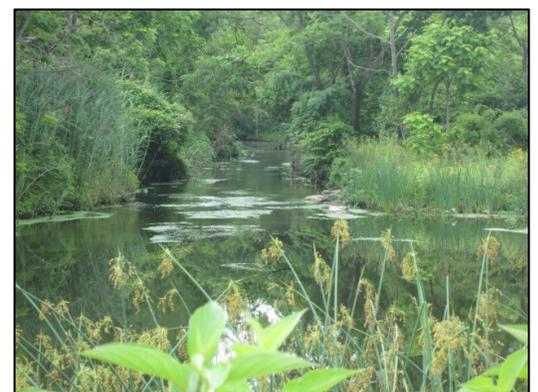
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significant flooding, nearby areas such as the Village of Lindenhurst experienced high volumes of water and debris associated with the storm which overwhelmed and impacted the drainage system to the point where it no longer served to efficiently drain roadways and adjacent properties. As a result, the Village of Lindenhurst Planning Committee focused on storm sewer projects to decrease vulnerability to flooding. The Village of Babylon/West Babylon NYRCR Plan focused on projects intended to adequately equip the municipalities and first responders during natural disasters (e.g., fixed generators at Fire Department and DPW facility, and the construction of an emergency equipment garage).

One of the West Islip NYRCR Community's strategies dealt with expanding local resources for residents likely to be impacted by future flooding and removing them from harm's way (i.e., designated parking refuge; local drop-in/distribution center). The NYRCR West Gilgo to Captree Plan identified projects ranging from shoreline stabilization and fire protection to the installation of backup power at community facilities. One of the projects of the NYRCR Fire Island Planning Committee was to create a mechanism for enhanced communication, collaboration and regional planning among the many Fire Island interests and the Long Island mainland. The design of a wastewater collection and treatment center (Mastic Beach/ Smith Point of Shirley NYRCR Community) was intended to protect downtown Mastic Beach and low-lying residential areas while the Oakdale/West Sayville NYRCR Plan covered multimodal transportation and tourism development among other issues.

Long Island's Future Economy, Long Island Regional Economic Development Council, 2011. This plan was initiated by New York State as a means of reviving the Long Island regional economy. The plan contains six major strategies that cover a broad spectrum of economic and quality of life issues. The Executive Summary of the Plan describes the strategies as follows (language from document):

- Create a cohesive education and workforce training strategy through partnerships among a range of stakeholders – business, trade groups, labor, government agencies, educational institutions, parents and students – with the goal of ensuring that workers from all of Long Island's communities are prepared to take advantage of new job opportunities in key economic growth sectors.
- Develop innovation and industry clusters in transformative



“Daylighting” and efforts to restore a stream's ability to transport, store and filter storm water can play a role in improving water quality.

Source: Jacobs



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locations across the region including downtowns, brownfields and university, research and medical centers by integrating the smart-growth principles of transit-oriented development and vibrant community life.

- Enhance and develop multi-faceted, interdisciplinary facilities aimed at incubating and accelerating the commercialization of innovative products generated at the region's premier research institutions, by linking scientists, engineers, health and medical professionals to entrepreneurs and small businesses.
- Reinvigorate Long Island's manufacturing sector through continued transformation from traditional defense and aerospace work to advanced technology products, creating skilled, high-value jobs and a network of nimble companies that can develop synergistic partnerships with companies in other regions of the state.
- Produce a new generation of sustainable, good-paying jobs in the legacy sectors of agriculture, aquaculture, fisheries and tourism by expanding export opportunities, infrastructure, recreation facilities, research partnerships and workforce training.
- Rebuild and expand infrastructure to improve job access, revitalize downtowns and transit hubs, speed trade, and attract and retain dynamic regional businesses and highly skilled workforce.

This study has relevance to the NYRCR Community, specifically as it relates to the last two strategies identified above. The first relates to tourism and the role of Bay Shore as the largest port to Fire Island for both passengers and freight. The last strategy also relates to Bay Shore in the recommendation to revitalize the downtown and in its role as a transit hub (bus, rail, ferry). Implementation of these regional strategies will help to strengthen the local economy and improve resiliency.

Regional Comprehensive Sustainability Plan, Sustainable Strategies for Long Island 2035, Long Island Regional Planning Council, 2010. The plan noted the challenges to Long Island's ability to sustain itself fiscally, environmentally and socially, based on current governance methods and policies. The plan put forward that



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fundamental change would be necessary to alter the course of the future. “Despite these challenges, Long Island has a tremendous opportunity to redefine what it means to live in a sustainable 21st century suburban community, recognizing it is possible for Long Island to be affordable and prosperous, bringing a return to economic growth and strength. Our ability to act today – and leave behind the status quo - will have a tremendous impact on the future of the region.”³³

Fire Island Inlet to Montauk Point (FIMP) Reformulation Study, U.S. Army Corps of Engineers (USACE), (in progress). The purpose of the study is to identify, evaluate and recommend long-term solutions for hurricane and storm damage reduction for homes and businesses within the floodplain along the ocean and bay shoreline (mainland of Long Island) from Fire Island Inlet to Montauk Point. The bay shoreline includes the NYRCR Greater Bay Shore Community.

The study process began in the 1960s and has been active intermittently through the years but was never completed, adopted or implemented. As a result of Superstorm Sandy in 2012, significant coastal erosion and property damage occurred on Fire Island. It was estimated that the beaches and dunes on Fire Island lost 55% of their pre-storm volume equating to a loss of 4.5 million cubic yards of sand.³⁴ Many of the dunes along the ocean-front were washed away, greatly increasing the vulnerability of both Fire Island and the bay-front communities to future storms.

In response to this occurrence and the need to prompt action, USACE proposed an expedited implementation of the Reformulation Study within the area extending from the Fire Island Inlet to Moriches Inlet. This effort resulted in a report prepared by the USACE entitled, “Fire Island Inlet to Moriches Inlet, Fire Island Stabilization Process, Hurricane Sandy Limited Reevaluation Report.” According to USACE, the proposed project includes placing approximately 7,000,000 cubic yards of sand material on the beach along the Atlantic Ocean. The material will be obtained from three offshore sites. The stabilization effort has been developed as a one-time, stand-alone construction project to repair damages caused by Superstorm Sandy and to stabilize the island.³⁵ The FIMP study is expected to be completed in the near future. Upon approval, funding will become available to complete projects recommended in the study. It is expected that this will include increasing the height and width of the primary dune on the ocean side of Fire



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Island in selected, vulnerable locations, and raising, demolishing or relocating homes away from the planned primary dune line. There are also components of the plan that could affect the South Shore and could potentially involve the Greater Bay Shore area. Possible projects that are being considered in these communities include raising houses and roads in certain highly vulnerable locations.

Long Island South Shore Estuary Reserve Comprehensive Management Plan, Long Island South Shore Reserve Council, New York State Department of State, 2001. This estuary plan includes the Great South Bay and the other bays that are part of the estuary that are located between much of mainland Long Island and the barrier beach. The plan includes recommendations for management of the estuary in a holistic manner and in contrast to the multitude of municipal, county and State jurisdictions that divide the estuary. These include:

- To sustain cooperation and commitment among all public and private interests with a stake in the estuary;
- To build public awareness and understanding about the estuary and the issues that affect its health and vitality, and to involve the public in its management; and
- To identify future research in areas where further scientific information is needed to improve management actions.³⁶

Of particular note, in 2008 the NYS Department of Environmental Conservation (DEC) declared the entire South Shore Estuary Reserve an impaired waterbody under the Federal Clean Water Act. This further underscored the importance of implementing the Comprehensive Management Plan.

Cleaner Greener Long Island Regional Sustainability Plan (CGLI Plan), Cleaner Greener Consortium of Long Island; Town of North Hempstead, Lead Municipality, May 2013. The CGLI Plan is a community-based, collaborative effort for a more sustainable future for Long Island. The CGLI Plan is based on the *Cleaner Greener Communities* program established by Governor Cuomo in 2011. This program empowers regions to create more sustainable communities by funding smart development practices. This effort will guide integrated, sustainable solutions from statewide investments to regional decision-making on land use, housing,



transportation, energy, infrastructure and environmental practices to improve overall quality of life.³⁷

Potential Regional Issues and Concerns

Long Island spans over 118 miles from New York Harbor to Montauk Point and has a maximum width of approximately 23 miles between the Long Island Sound to the north and the Atlantic Ocean to the south. Long Island, the 11th largest island in the nation, has a land area of over 1,400 square miles and is larger than the state of Rhode Island. Due to its island geography, many of the communities and counties within the Island share similar challenges as well as opportunities relative to the natural environment, physical infrastructure, and other built systems. Potential Island-wide issues are expanded upon below.

Natural Environment. Long Island has 1,180 miles of shoreline fronting the Atlantic Ocean, Sound, and a number of lakes, bays, inlets and canals. Approximately one-fifth of Long Island's land is protected from development by Federal, State, County, or municipal entities. About half of this land represents over 800 public parks on Long Island ranging from small community playgrounds to larger parks like Fire Island National Seashore and Bethpage State Park.³⁸ The continued protection of Long Island's water supply and sole source aquifers is also a significant regional issue and is directly related to the preservation of the natural environment.

Developable Land Supply. Almost two-thirds of Long Island's land surface is developed with buildings, pavement and other manmade structures. This condition in combination with the large amount of protected/preserved land, results in a limited supply of available vacant land to accommodate new housing or economic development activities. As such, it is expected that redevelopment will become the primary means of providing new housing and economic development.

Water Quality. Long Island's aquifers receive their fresh water from precipitation that percolates into the ground and is recharged into the groundwater system. The greatest threat to the quality (and quantity) of this water is development (residential / commercial / industrial) in sensitive areas that would add pollutants (and impede the absorption of precipitation).

Other threats to water quality include non-point source pollution and storm water runoff, which are County-wide concerns. Nonpoint



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sources typically include fertilizer and pesticides, oil and other automobile fluid, as well as animal and pet waste. This type of pollution has the potential to seep into ground water and impact surface waters such as the Great South Bay. While the Great South Bay is a surface water body, it is also a significant habitat comprised of features such as barrier beaches and islands, wetlands as well as marsh islands.

Non-point source pollution released into the Bay can result in increased bacteria levels which in turn can lead to the closure of large areas of the bay to economic activities like fishing as well as marine-dependent uses. The continued discharge to ground and surface waters in addition to increased runoff from roadways and septic systems have been adversely impacting water quality and vegetation in the vicinity of the Great South Bay. These water quality concerns also have the potential to impact spawning habitats as well as many marine species that are dependent on these systems.

Governor Cuomo recognized the importance of investing in storm protection, resilience, and water quality through new wastewater infrastructure in Suffolk County, and in October 2014, New York State announced an unprecedented investment of \$383 million for sewers in the County.

Utilities. Electricity and the susceptibility of the power grid are both national and regional issues of concern. The Long Island Regional Economic Development Council (LIREDC) strategic economic development plan update has similarly stressed the importance of addressing utility vulnerabilities, which currently exist across the Island.

Climate Change. As a coastal area, Long Island is susceptible to rising sea levels, especially as it relates to storm surges. Flooding generated by major weather events, 100-year storms, or just a heavy downpour, causing damage to residences and property, have been occurring with greater frequency. According to a joint Columbia University and City University of New York study, the sea level is anticipated to increase by 4 to 12 centimeters in the New York region by the 2020s and by 30 to 56 centimeters in the region by 2080.³⁹



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Public Health and Economic Equity. Other issues that are pertinent on a regional level include those related to public health and economic equity. These include projects designed to improve the quality of life for the Island's impoverished, underinsured or at-risk populations. Emergency preparedness projects are also important to improve the overall safety of the Island's population. These include: maintaining evacuation route access; improving the communication capability for a multi-jurisdictional response during emergency events.

Regional Economy. As the economy of Suffolk County and Long Island evolves the challenge of attracting and retaining sustainable, well-paying employment opportunities in the legacy sectors of agriculture, aquaculture, fisheries and tourism remains a key concern. At the same time, supporting new emerging industries that look towards the future of the region are important in order to maintain a balanced and sustainable economy. In support of regional economic initiatives like workforce retention and business diversification, efforts to rebuild and expand infrastructure, revitalize downtowns and transit hubs, and expand housing opportunities are crucial.



Section II: Assessment of Risk and Needs

A. Description of Community Assets and Assessment of Risk

In undertaking the NY Rising Community Reconstruction (NYRCR) process, it was crucial that the Greater Bay Shore Committee develop an accurate and comprehensive understanding of the key assets in the community and the level of risk to which each of these assets is subject. The following section provides an overview of that effort.

A critical goal of the Greater Bay Shore NYRCR Plan is to ensure that the Community's social, economic, and natural-resource assets and systems that were affected by Superstorm Sandy are more resilient against future storms. To that end, assets that have been or may be affected by storms were identified to help determine whether reconstruction strategies and implementation projects effectively reduce risk to all aspects of the community.

Assets and asset systems are places, services, or entities where economic, environmental, and social functions of the Community occur. Examples of assets include critical facilities, such as schools, hospitals, and medical facilities; emergency and public safety services, including fire and police protection; and natural, cultural, and recreational resources, such as wetlands beaches, and parks. Assets also include critical infrastructure, such as transportation roadways, mass transit services, utility networks, and stormwater systems required to support those essential community functions. The purpose of the asset inventory is to create a comprehensive description of the assets within or near the Greater Bay Shore NYRCR Community (Community) whose loss or impairment due to flood events would compromise essential functions or critical facilities of the community. Critical facilities are those that are vital to the health and welfare of the whole population and are especially important following hazard events.⁴⁰ Non-critical facilities are those that could be replaced or replicated without placing a significant burden on the Community's long-term health and function. The inventory documents both landscape features and vulnerabilities of the assets that contribute to flood risk. The inventory provides the basis for examining assets in more detailed risk mapping and assessment.



The waterfront, its marinas and the economic and recreational opportunities they provide are key assets for the Greater Bay Shore Community.

Source: Jacobs



Community members at Public Engagement Event 1 (July 2014) help identify key community assets.

Source: Jacobs



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Assets were identified in three geographic areas at risk to storm inundation and sea level rise:⁴¹

- **Extreme Risk Area:** Assets located in the extreme risk area are currently at risk of frequent inundation, vulnerable to erosion in the next 40 years, or likely to be inundated in the future due to sea level rise;
- **High Risk Area:** Assets located outside of the Extreme Risk Area that are currently at occasional risk of inundation or at future risk from sea level rise; and
- **Moderate Risk Area:** Assets typically located upland or at a higher elevation than assets in the Extreme and High Risk Area. Assets in the Moderate Risk Area are currently at infrequent risk of inundation or at risk in the future from sea level rise.

Figure 2 shows the Risk Assessment and Inundation Map for the Greater Bay Shore Community.

The complete inventory provides more detail on each identified asset, such as its classification as a critical or non-critical facility; whether the asset serves a vulnerable population; and the relative value, or importance, of the asset to the Community. The NYRCR Planning Committee (Committee) identified the assets' value as high, medium, or low.

*A **High Value** Community Asset is determined by the Community to be so significant in the support of that Community's day to day function that the loss of that asset or extended lack of functioning would create severe impacts to the Community's long-term health and well-being or result in the loss of life or injury to residents, employees, or visitors.*

*A **Medium Value** Community Asset is determined by the Community to be important to the functioning of the Community's day-to-day life and that the loss of that asset or extended lack of functioning would cause hardship to the Community's well-being but who's function could be replaced or duplicated in a mid-term time frame without significant burden to a Community's long-term health.*



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*A **Low Value** Community Asset is determined by the Community to play a role in the functioning of a community's day to day life, but whose loss could be managed and overcome within a community without substantial impact to that community's functioning. Can be started, replaced, or temporarily duplicated in a short-term time frame with limited burden to a Community's long-term health.*

The Consultant Team also noted contributing landscape attributes and physical features of assets affected the severity of storm impacts. For example, assets located near shorelines lacking the protective features of wide beaches, healthy dunes, and stable, indigenous vegetation are at increased risk of flooding. Specific features of assets that are at risk (e.g., mechanical equipment below flooding elevation) are also recorded in the inventory to help guide the selection of appropriate strategies and projects for risk reduction.

The community assets and their corresponding risk assessments, identified by the Committee and community at large, are presented in the following tables. The complete asset inventory is found in Section V.



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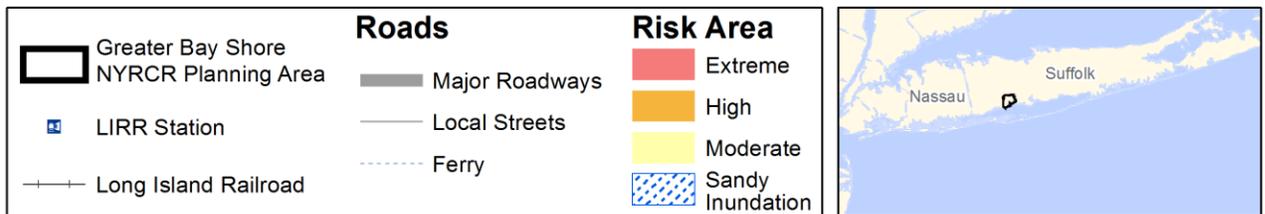
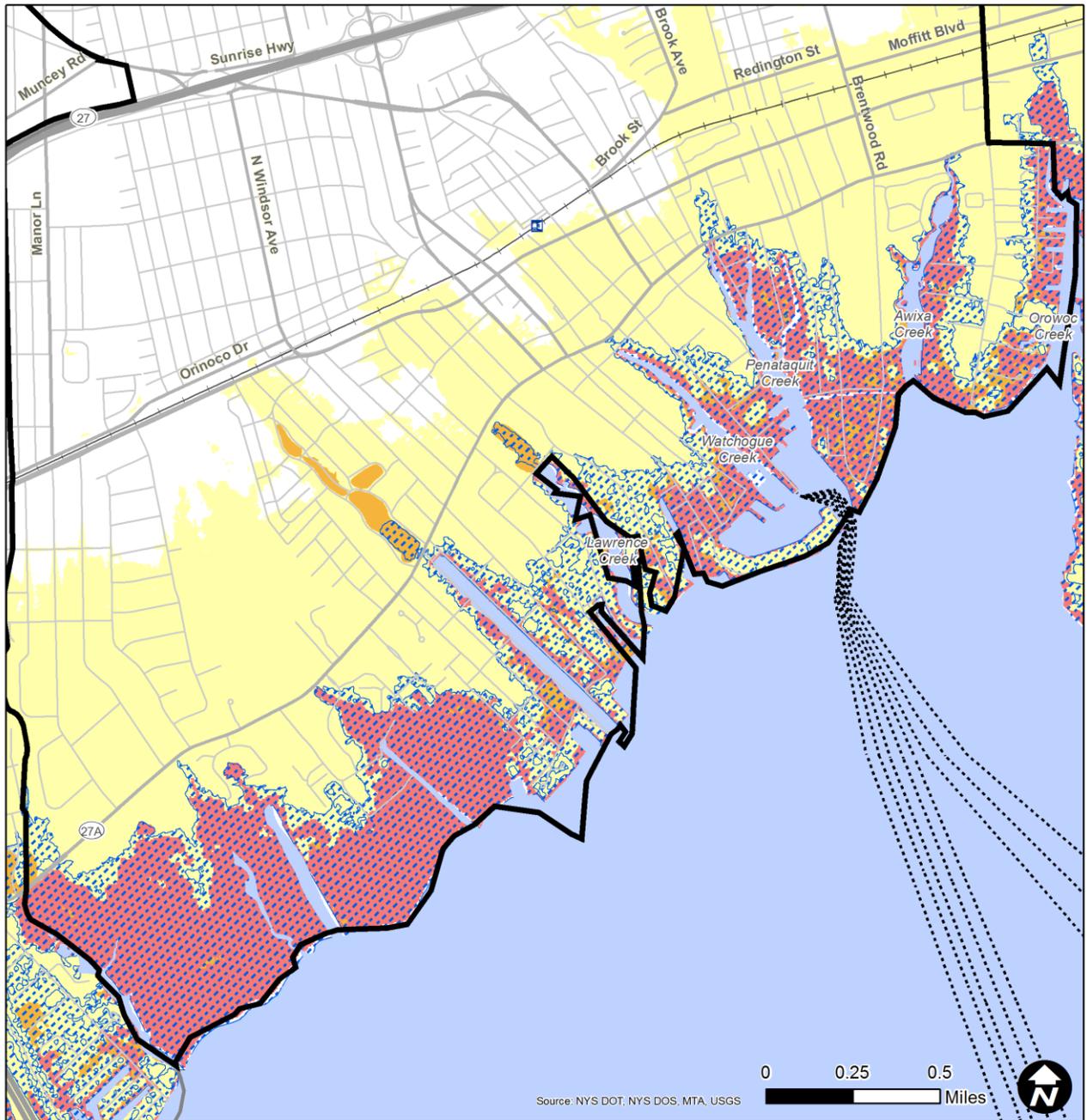


Figure 2. Risk Area and Superstorm Sandy Inundation



Description of Community Assets

Assets were identified through two methods: community engagement and Geographic Information System (GIS) data review and mapping. The community engagement approach was first undertaken by the Committee, who identified assets known to community residents. In addition, public comment and insight on community assets was sought and provided at three Public Engagement Events.

The data review and mapping effort was undertaken using information supplied by New York State Department of State (NYS DOS) and other State and Federal agencies, including the Federal Emergency Management Agency (FEMA).

The mapping effort was intended to supplement the work of the Committee by identifying resources that may be inaccessible to the public but that are regulated by a public agency (such as undeveloped parklands and marshes), as well as those that may have been hiding in plain sight (i.e., assets vital to the Community's health and resilience that go unnoticed on a day-to-day basis because they only become obvious when they fail, such as small roadway bridges and smaller government service offices). The assets identified through the mapping effort were combined with the asset data provided by the Committee and community residents during Committee Meetings and Public Engagement Events. The results provided a complete picture of not only the assets themselves, but their value as perceived by the community.

An overview of community assets for each asset class is provided below. Although assets are separated into distinct classifications, there is overlap between these assets across designations. For instance, Bay Shore Marina could fall into a number of categories such as infrastructure, economic driver as well as a recreational resource. The asset classifications, which included facilities and/or specific places as well as systems (storm sewer, electric, etc.), are as follows:

- **Cultural, Natural, and Recreational Resources:** The benefits of natural infrastructure have been increasingly recognized among hazard planners. Coastal ecosystems can assist in wave attenuation, deflection, erosion reduction, as well as stormwater retention. Wetlands help to cleanse urban stormwater of contaminants before it enters local waterways, improving overall water quality; shoreline green



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space provides wildlife habitat as well as recreation and improved quality of life for residents. As a bayfront community, Greater Bay Shore is interested in not only maintaining but also improving upon their natural resources including Gardiner Park, Walker Park and Gilbert Park.

- **Health and Social Services (Life Safety and Administration/Education):** The ability to restore and improve health and social service networks to promote the resilience, health, independence, and well-being of the entire Community is the core recovery concern for this asset class. These functions are especially important to vulnerable populations that may require uninterrupted access to medical and social services during and after disaster events.
- **Infrastructure Systems (Transportation and Utilities):** The roadway and rail networks, gas mains, sewage collection and treatment facilities, public water supply system, and the power grid are central to the Community because they provide basic quality of life functions as well as the ability to travel within and between neighborhoods, access employment, and communicate. The ability to restore these functions in a timely manner after a storm and better protect these systems in future hazards is important in terms of creating a viable, more resilient community. Investments in infrastructure can be effective both in rebuilding capabilities lost during a storm and in providing economic development from job creation. Early on in the NYRCR planning process, the Committee indicated that travel conditions, utility outages, and the ability to communicate effectively hindered the cleanup and rebuilding process post-Superstorm Sandy.
- **Housing:** Housing solutions are important in that they effectively support the needs of the whole Community, including those of vulnerable populations, and contribute to the Community's sustainability and resiliency. Housing is critical since local economies cannot recover from devastating disasters without adequate housing. It is challenging because many years' worth of housing repair, rehabilitation, reconstruction, and new construction often need to occur at an accelerated pace as a result of a disaster. These conditions create design, construction, labor, materials, logistics, inspection, and financing



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problems. Many of these issues were experienced in the residential areas south of Montauk Highway, which sustained heavy damage from Superstorm Sandy.

- **Economic:** The assets within this category are important to the Community in that they help to sustain and/or rebuild businesses and employment and also develop economic opportunities that result in sustainable and economically resilient communities. The Greater Bay Shore Community has a resurgent downtown commercial district along Montauk Highway/Main Street as well as a marine oriented economy that ranges from water dependent uses as typified by marinas, boat sales and repair facilities and dredging companies, and water enhanced uses such as dining establishments along its waterfront. The businesses within these areas are high-value assets and maintaining their economic vitality will ensure the ability of these businesses to remain within the Community.

Natural and Cultural Resources

Natural and cultural resources include natural habitats, wetlands and marshes, recreation facilities, parks, open space, religious establishments, libraries, museums, historic landmarks, and performing arts venues.

The Greater Bay Shore waterfront has historically been, and continues to be, a natural and recreational resource. The area along the coastline is also the location most likely to be inundated during a storm event; but the location of some undeveloped natural coastal resources (e.g., Gardiner County Park) can provide protective detention capacity that can reduce the impact of storm surges to inland development. These resources are therefore not themselves at risk by virtue of their location in a risk area—however, protecting their health may be critical to the protection of other nearby assets. Many of these resources, such as the waterfront parks, are vitally important to the Community, both in terms of cultural/recreational value and in terms of increased resiliency. While relatively dense suburban development patterns throughout the Town of Islip have compromised the overall health of the watershed, many residents recognize, particularly following Superstorm Sandy, the critical role these watersheds play in managing stormwater and local water quality.



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As noted in Table I, there are many parks located within the NYRCR Greater Bay Shore Community (see Table 1). These parks are all located in risk areas. Bay Shore Marina, Gilbert Park, George S. King Park, and the Community Reflection Garden are located in the Moderate risk area. Watchogue Creek Park is located in the High risk area. Gardiner County Park, Walker Park, Homan Avenue Dock, Maple Avenue Dock, and Ocean Avenue Dock are all located near major water bodies and are within the Extreme risk area. During the planning process, the Committee identified parks/recreational resources as generally having a high value to the Greater Bay Shore Community.

Table 1. Parkland Resources

Asset/Resource	Risk Assessment Area(s) ⁴²	Community Value
Gardiner County Park	Extreme	High
Walker Park	Extreme	High
Homan Avenue Dock	Extreme	High
Maple Avenue Dock	Extreme	High
Ocean Avenue Dock	Extreme	High
Watchogue Creek Park	High	High
Gilbert Park	Moderate	Low
Bay Shore Marina (Town of Islip)	Moderate	High
Dr. George S. King Park	Moderate	High
Community Reflection Garden	Moderate	High

The Greater Bay Shore NYRCR Planning Area encompasses several water bodies. Both the Brightwaters Artificial Lakes and Brightwaters Canal were both identified as having a relatively high value to the Community (see Table 2).

Table 2. Natural Resources

Asset/Resource	Risk Assessment Area(s)	Community Value
Isbrandtsen Wetlands	Extreme	High
Brightwaters Lakes	High	Medium
Old Mill Pond	Moderate	High
Brightwaters Canal	Extreme	High

There are two properties listed in the National Register of Historic Places located in the NYRCR Community (see Table 3). Both are in the Moderate risk area.



Table 3. National Register Listed Historic Resources

Asset/Resource	Risk Assessment Area(s)	Community Value
Second Avenue Firehouse	Moderate	High
Sagtikos Manor	Moderate	Medium

Five religious institutions have been identified as being in a Moderate risk area (see Table 4). The remaining three assets are located outside of the risk area. The Committee identified religious institutions as being valuable to the Community.

Table 4. Religious Institutions

Asset/Resource	Risk Assessment Area(s)	Community Value
St. Patrick Church (Hospitality Center)	Moderate	High
Montfort Seminary	Moderate	Medium
St. Peter's By The Sea	Moderate	Medium
St. Luke's Church	Moderate	Medium
Bay Shore United Methodist Church	Moderate	Medium
First Congregational Church of Bay Shore	Outside of Risk Areas	High
First Baptist Church	Outside of Risk Areas	Medium
Bay Shore Jewish Center	Outside of Risk Areas	Low

There are two recreational facilities in this Community (see Table 5). Both are located in the Moderate risk area. The YMCA has been specifically identified by the Committee as having a high value.

Table 5. Recreational Resources

Asset/Resource	Risk Assessment Area(s)	Community Value
Great South Bay YMCA	Moderate	High
Southward Ho Country Club	Moderate	Medium

Health and Social Services: Life Safety

Health and Social Services: Life Safety includes fire protection, police services, hospitals, and emergency operations facilities. Of the five emergency operations facilities in Suffolk County, two are located along the South Shore of Long Island: the Babylon Town Civil Defense facility is located directly north of the Village of Lindenhurst, and the Islip Public Safety facility is located in Islip Hamlet between the NYRCR Greater Bay Shore and Oakdale/West Sayville Communities. Two local public schools in the Community are designated as shelters (See Table 12).



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The closest Suffolk County Police Department precinct to the Community is the Third Precinct, which is located on 5th Avenue approximately 0.6 miles north of the Southern State Parkway. As the Southern State Parkway comprises this Community’s northern boundary, the precinct is not included as a Community asset despite its close proximity to Greater Bay Shore.

Within the NYRCR Greater Bay Shore Community, there are three fire stations under the jurisdiction of the Bay Shore Fire Department (see Table 6). However, the Bay Shore Fire Department Headquarters, Fire Station 1, and Fire Station 2 stations are all located outside of the risk areas. During Committee deliberations and throughout the planning process, a constant theme was the importance of first responder facilities within the Community.

There is one rescue ambulance company (Bay Shore-Brightwaters Rescue Ambulance) in the Community (see Table 7). The company’s facility is located in a Moderate risk area adjacent to LIJ Southside Hospital. One hospital (LIJ Southside Hospital) is located within the Community along with a corresponding LIJ Southside Outpatient cancer care center (see Table 8). Both facilities are located in a Moderate risk area but were identified as high community value resources.

Table 6. Fire Stations

Asset/Resource	Risk Assessment Area(s)	Community Value
Bay Shore HQ Fire Station (Underground Tanks)	Outside of Risk Areas	High
Bay Shore Fire Station 1	Outside of Risk Areas	High
Bay Shore Fire Station 2	Outside of Risk Areas	High

Table 7. Rescue Ambulance

Asset/Resource	Risk Assessment Area(s)	Community Value
Bay Shore-Brightwaters Rescue Ambulance	Moderate	High

Table 8. Hospitals

Asset/Resource	Risk Assessment Area(s)	Community Value
LIJ Southside Hospital	Moderate	High
LIJ Southside Outpatient Cancer/Oncology Center	Moderate	High



Health and Social Services: Administration and Education

Health and Social Services community assets include administrative and education amenities which serve a variety of public functions, from health treatment facilities to general purpose shelters in public schools, and post offices to town halls. During a storm event, these facilities may potentially serve as critical disaster response and recovery centers, the identification of which is essential to future disaster management and preparedness.

The Community has identified the following health and medical facilities as vital to the well-being of residents, particularly during flood and storm events (see Table 9).

Table 9. Health /Medical Facilities

Asset/Resource	Risk Assessment Area(s)	Community Value
South Shore Professional Plaza	Moderate	High
Touro College School of Health Sciences	Moderate	High
Shore Drugs	Moderate	Medium
Bay Shore Animal Hospital	Moderate	Medium
Good Samaritan Hospital Dialysis	Outside of Risk Areas	High

Two post offices serve the Community, one in Bay Shore just north of Sunrise Highway and one in the Village of Brightwaters in the northwest portion of the Community (see Table 10). Both post offices are located outside of the risk area.

Table 10. Post Offices

Asset/Resource	Risk Assessment Area(s)	Community Value
Bay Shore	Outside of Risk Areas	Medium
Brightwaters	Outside of Risk Areas	Medium

The Bay Shore-Brightwaters Public Library (see Table 11) is located inside a Moderate risk area.

Table 11. Public Libraries

Asset/Resource	Risk Assessment Area(s)	Community Value
Bay Shore- Brightwaters Public Library	Moderate	High

There are eight identified schools located in the NYRCR Community, six of which are located in non-risk areas (see Table 12). South Country School is located north of Montauk Highway in a Moderate



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risk area. St. Patrick School on Main Street is also located in a Moderate risk area. The two schools identified by NYS DOS as emergency shelter facilities are within non-risk areas. Bay Shore High School was specifically identified by the Committee as having a high community value.

Table 12. Schools

Asset/Resource	Risk Assessment Area(s)	Community Value
South Country School	Moderate	High
St. Patrick School	Moderate	High
Mary G. Clarkson School	Outside of Risk Areas	High
Bay Shore Middle School (Shelter)	Outside of Risk Areas	High
Gardiner Manor School	Outside of Risk Areas	High
Bay Shore High School (Shelter)	Outside of Risk Areas	High
Brook Avenue Elementary School	Outside of Risk Areas	High
Fifth Avenue School	Outside of Risk Areas	High

The Brightwaters Village Hall is located outside of the risk area, just south of Sunrise Highway (see Table 13); however, this facility has been identified as having value to the Community due to its role in command and control during emergency events.

Table 13. Town/Village Halls

Asset/Resource	Risk Assessment Area(s)	Community Value
Village Hall: Brightwaters	Outside of Risk Areas	Medium

Infrastructure: Transportation

Major roadways extending through the Community include the Southern State Parkway, Sunrise Highway (SR 27), and Montauk Highway/Main Street. Both the Southern State Parkway and Sunrise Highway are located outside of the risk area. While they are subject to flooding during extreme rainfall events, such as occurred in August 2014, such flooding is rare. Montauk Highway/Main Street (SR 27A) is located mostly within a Moderate risk area with smaller portions located within the Extreme risk area. The Long Island Rail Road (LIRR) right-of-way is at-grade throughout the Greater Bay Shore NYRCR Community.

The LIRR's Montauk Branch provides frequent service to points west and east. This particular NYRCR Community is home to one at-grade LIRR station (Bay Shore), which provides transit connections to six Suffolk County Transit (bus) routes: S40, S41, S42, S45, S2A, and S2B. These bus routes connect to the Greater Bay Shore Community



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and to points north, east, and west. The Bay Shore LIRR Station is outside of the risk area (see Table 14).

Ten at-grade crossings with LIRR crossing gates (North Windsor Avenue, Clinton Avenue, 5th Avenue, 4th Avenue, 3rd Avenue, 2nd Avenue, South Penataquit Avenue, Brentwood Avenue, Saxon Avenue, and Grant Avenue) are located along the LIRR Montauk Branch within the Community.

Table 14. LIRR Facilities

Asset/Resource	Risk Assessment Area(s)	Community Value
Bay Shore LIRR Station	Outside of Risk Areas	High

The Bay Shore Ferry Terminal is a vital transportation resource, holding a high community value, which is located within the Extreme risk area (see Table 15). The Ferry Terminal plays a large role in the regional transportation network carrying both people and goods/supplies from the Long Island mainland to various locations on Fire Island. As a result, the Terminal is critical for the region's economy, as well as the distribution/transportation of supplies during emergency events. The Ferry Terminal is also a vital link for the evacuation of Fire Island in advance of major coastal storms.

Table 15. Marine Transportation Facilities

Asset/Resource	Risk Assessment Area(s)	Community Value
Bay Shore Ferry Terminal	Extreme	High

Infrastructure: Utilities

There are several infrastructure/utility properties located in the Extreme and High risk areas of Greater Bay Shore. The Suffolk County Department of Public Works operates two sewage pump stations within the Community, both of which are located in the Extreme risk area. There are also two storm sewer pump stations located in the Extreme risk area. Both sanitary and storm sewer infrastructure and facilities within Greater Bay Shore were identified as having a high community value.

Within the Moderate risk area, there are several assets, including the Frank Brothers Fuel Property (a home heating oil storage facility with above ground tanks) and a New York SMSA Cell Tower. An additional six infrastructure/utility properties are located outside of the risk area (see Table 16). Gas, electric, and water distribution systems are present throughout these areas, but have not been



identified and mapped.

Table 16. Infrastructure Resources

Asset/Resource	Risk Assessment Area(s)	Community Value
Storm Sewer Pump-out Station (Ocean Avenue Dock)	Extreme	High
Storm Sewer Pump-out Station (Maple Avenue Dock)	Extreme	High
Suffolk County DPW Sewage Facility (Joyces Way)	Extreme	High
Suffolk County DPW Sewage Pumping Facility (Prospect Avenue)	Extreme	High
Frank Bros Fuel Property	Moderate	High
New York SMSA Cell Tower	Moderate	High
SCDPW Fueling Facility	Outside of Risk Areas	High
Cingular Wireless Cell Tower	Outside of Risk Areas	High
LIPA Plume Filtration Site	Outside of Risk Areas	High
SCWA Property 1 (North Clinton)	Outside of Risk Areas	Medium
SCWA Property 2 (Brightwaters)	Outside of Risk Areas	High

Housing

A significant number of residential structures are at risk of flooding and/or storm surge events within the Greater Bay Shore NYRCR Community. There are 810 residential structures located within the Extreme risk area while a smaller number, approximately 52, are found within the High risk area (see Table 17). The Moderate risk area contains an estimated 3,035 residential structures. Of the two senior housing complexes within the Community, the Atria Bay Shore Senior Living facility is located in the Moderate risk area while the Low Income Senior Housing facility is located outside of the risk area. Similar to first responder facilities, the Committee indicated that housing resources, including those for low-income and seniors, were among the resources which were considered of highest community value.

Table 17. Housing Resources

Asset/Resource	Risk Assessment Area(s)	Community Value
Bay Shore Housing – (598 parcels)	Extreme	High
West Bay Shore Housing – (85 parcels)	Extreme	High
Brightwaters Housing – (127 parcels)	Extreme	High
Bay Shore Housing – (29 parcels)	High	High



Table 17. Housing Resources (Cont'd)

Asset/Resource	Risk Assessment Area(s)	Community Value
Brightwaters Housing – (16 parcels)	High	High
West Bay Shore Housing – (7 parcels)	High	High
Bay Shore Housing – (1,881 parcels)	Moderate	High
Atria Bay Shore Senior Living	Moderate	High
West Bay Shore Housing – (829 parcels)	Moderate	High
Brightwaters Housing – (325 parcels)	Moderate	High
Low Income Senior Housing	Outside of Risk Areas	High

Economic Centers

The primary economic centers in the Greater Bay Shore NYRCR Community include the Montauk Highway/Main Street corridor and the Bay Shore Business Improvement District (BID). The BID spans an area from the waterfront northward to the train station and from Windsor Avenue eastward to Brentwood Road. Local marinas and marine (dredging) operations also play a crucial role in the area’s economy and contribute to a thriving waterfront economy (see Table 18). The Orinoco Business District in the Village of Brightwaters is also an important upland commercial area located outside of identified risk areas.

Table 18. Economic Resources

Asset/Resource	Risk Assessment Area(s)	Community Value
Maple Avenue Marina	Extreme	High
Coastal Yachting Center & Marina	Extreme	High
South Bay Marina	Extreme	Medium
Business Improvement District	Moderate	High
Montauk Highway/Main Street	Moderate	High
Orinoco Drive Business District	Outside of Risk Areas (Small portion in Moderate)	High
Bay Shore Yacht Club	Outside of Risk Areas	Low
South Shore Mall	Outside of Risk Areas	Medium
Gardiner Manor Mall	Outside of Risk Areas	Medium

Assessment of Risk to Assets and Systems

Risk to an asset, for the purpose of this NYRCR Plan, is the chance that the asset will be damaged or destroyed in flooding events. Assessing the risk to community assets and systems helped the



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Committee identify and understand projects and measures to protect assets at the greatest flood risk, while also ensuring appropriate long-term economic growth. The three factors that contribute to the measure of overall risk for each asset are:

- **Hazard:** The likelihood and magnitude of future storm events. Examples of the most common hazard risks include coastal flooding, flooding in a 100-year floodplain, sea level rise, or hurricanes. Typically, an asset located in an Extreme risk area experiences hazards with greater frequency and intensity than an asset in a High or Moderate risk area.
- **Exposure:** The moderating effect of topographic and shoreline features. If assets are more exposed (e.g., situated on low-lying floodplains, directly exposed to a probable storm surge, or otherwise unprotected), they are more likely to suffer storm effects than similar assets located at a higher elevation or on a rocky shoreline protected by dunes. Similarly, landscape features and vegetation are more important for an asset proximate to a flood source than an asset further inland.
- **Vulnerability:** The level of impairment or consequences that an asset may experience from a storm event. The ability of an asset to resist damage from a storm is a measure of vulnerability. If an asset recovers quickly with limited interruption in service it has low vulnerability. An asset with extended service loss or permanently reduced capacity would be considered to be significantly vulnerable.

The Committee used a standardized Risk Assessment Tool developed by the New York State Department of State (NYS DOS) to assess and quantify the risk to their assets and to test whether various projects and management measures will reduce the risk to those assets. For each asset, the three factors that contributed to risk were scored and multiplied to produce a final risk score. The information collected during the Asset Inventory was entered into the Risk Assessment Tool to calculate the Risk Score. The formula used to calculate risk was:

HAZARD X EXPOSURE X VULNERABILITY = RISK

The asset inventory provided a baseline to identify the most critical assets in the Community, which were then advanced through the



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Risk Assessment Tool for further analysis. The assets selected from the inventory for input into the Risk Assessment Tool included:

- Assets situated in Extreme and High risk areas
- Critical Assets (FEMA-critical) in Moderate risk areas⁴³
- Locally-significant community-identified (High Community Value) assets in Moderate risk areas
- Assets with High Community Value in non-risk areas
- Assets providing critical life safety services

In addition, related groups of assets, such as roadways, were compiled into a single asset to the maximum extent possible because these assets would likely experience the same effects from storm events and have similar risk scores. For example, residential homes with similar construction were grouped by risk area and assessed as a single asset group.

Greater Bay Shore Risk Assessment Results

The complete Asset Inventory Worksheet and corresponding Risk Assessment Tool data for the Greater Bay Shore Community are provided in Section V. The inventory catalogued approximately 65 assets that were carried through for analysis in the Risk Assessment Tool. These assets were identified over the course of several Planning Committee Meetings and Public Engagement Events, and supplemented with technical mapping work. Assets ranged from residential areas within Moderate, High, and Extreme risk areas to commercial clusters along Montauk Highway/Main Street and the waterfront. Other assets included transportation facilities, EMS resources, water and wastewater utility locations, and natural resource systems, including several local creeks and water bodies.

The character of the area south of Montauk Highway/Main Street is predominantly residential and marine-oriented uses, many of which are located on canals and creeks feeding into the Great South Bay. There is a significant quantity of housing, both in the Village of Brightwaters and throughout the unincorporated areas of Bay Shore and West Bay Shore, located in the Extreme risk area and classified as at Severe Risk. These areas are subject to persistent, recurring flooding during both major storms and typical seasonal weather (nor'easters) and high tides.

Throughout the course of the planning process, the susceptibility of this area was raised by Village and hamlet residents at the Public Engagement Events and by members of the Committee at their



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working sessions. Their concerns were highlighted by the record rainfall of August 2014 which flooded the stream corridors north of the coastal area before impacting the areas that had been damaged by Superstorm Sandy. More than a year after Superstorm Sandy, these neighborhoods are still recovering with homes in various states of repair and reconstruction (including elevation).

As a result, adequately addressing the needs of those residing south of Montauk Highway was of great concern to the NYRCR Planning Committee. This anecdotal evidence has been validated through the Risk Assessment analysis. Resources south of Montauk Highway and adjacent to the canals, lakes and creeks just upstream of the Great South Bay generally have higher risk scores, including many in the Severe and High Risk range. Overall, the assets and systems with the highest risk scores included the two Suffolk County DPW Sewage Pumping Facilities, the two Storm Sewer Pump Stations (Ocean Avenue and Maple Avenue Dock), and Gardiner County Park. Additionally, the Committee identified the residential housing assets as a high value asset group. These risk scores are shown on the Risk Score Maps below.

The Risk Table (Table 19. Assets at Risk) that begins on the next page provides an identification number for each asset shown on the Risk Scores Map. The table is color-coded by risk level: Severe Risk assets (shown in red in the table and map) are in a dangerous situation or location; High Risk assets (orange) are prone to significant negative outcomes from a storm; Moderate Risk (yellow) assets are prone to moderate to serious storm consequences; and Residual Risk assets (green) have relatively low vulnerability and exposure, and so are only prone to minor and infrequent threat.

The risk assessment helped inform, focus, and provide context for the needs and opportunities identified by the Planning Committee, discussed in the next section.



Table 19. Assets at Risk

COLOR KEY:

Severe Risk Range
High Risk Range
Moderate Risk Range
Residual Risk Range

ID#	Name
Economic	
43	Bay Shore Yacht Club
48	South Bay Marina
53	Maple Avenue Marina
56	Coastal Yachting Center & Marina
32	Business Improvement District
33	Montauk Highway/Main Street
85	Orinoco Drive Business District
73	South Shore Mall
74	Gardiner Manor Mall
Health and Social Services	
38	Bay Shore-Brightwaters Rescue Ambulance
39	LIJ Southside Hospital
41	LIJ Southside Outpatient Cancer/Oncology Center
72	Touro College School of Health Sciences
22	South Country School
25	Bay Shore-Brightwaters Public Library
67	Shore Drugs
69	South Shore Professional Plaza
70	Bay Shore Animal Hospital
82	St. Patrick School
2	Village Hall: Brightwaters
3	Post Office: Bay Shore
4	Mary G. Clarkson School
5	Bay Shore Middle School (Shelter)
6	Gardiner Manor School
8	Bay Shore HQ Fire Station (Underground Tanks)
9	Bay Shore High School (Shelter)
12	Brook Avenue Elementary School
13	Bay Shore Fire Station 2
16	Post Office: Brightwaters
17	Bay Shore Fire Station 1
19	Fifth Avenue School
71	Good Samaritan Hospital Dialysis



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Table 19. Assets at Risk (Cont'd)

COLOR KEY:	Severe Risk Range
	High Risk Range
	Moderate Risk Range
	Residual Risk Range

ID#	Name
Housing	
57	Bay Shore Housing - Extreme Risk Area
60	West Bay Shore Housing - Extreme Risk Area
63	Brightwaters Housing - Extreme Risk Area
58	Bay Shore Housing - High Risk Area
64	Brightwaters Housing – High Risk Area
61	West Bay Shore Housing - High Risk Area
59	Bay Shore Housing - Moderate Risk Area
62	West Bay Shore Housing - Moderate Risk Area
65	Brightwaters Housing - Moderate Risk Area
50	Atria Bay Shore Senior Living
29	Low Income Senior Housing
Infrastructure Systems	
49	Storm Sewer Pump Station (Ocean Avenue Dock)
51	Bay Shore Ferry Terminal
52	Storm Sewer Pump Station (Maple Avenue Dock)
54	Suffolk County DPW Sewage Pumping Facility (Joyces Way)
66	Suffolk County DPW Sewage Pumping Facility (Prospect Avenue)
21	Frank Bros Fuel Property
40	New York SMSA Cell Tower
1	Cell Tower
7	SCWA Property (North Clinton Avenue)
10	Suffolk County DPW Fueling Facility
14	Cingular Wireless Cell Tower
15	SCWA Property (Brightwaters Drive)
18	LIPA Plume Filtration Site
20	Bay Shore LIRR Station
Natural and Cultural Resources	
42	Gardiner County Park
44	Walker Park
78	Homan Avenue Dock
79	Maple Avenue Dock
80	Ocean Avenue Dock
81	Isbrandtsen Wetlands
68	Brightwaters Lakes
46	Gilbert Park
75	Watchogue Creek Park
23	Southward Ho Country Club
24	St. Peter's By The Sea



Table 19. Assets at Risk (Cont'd)

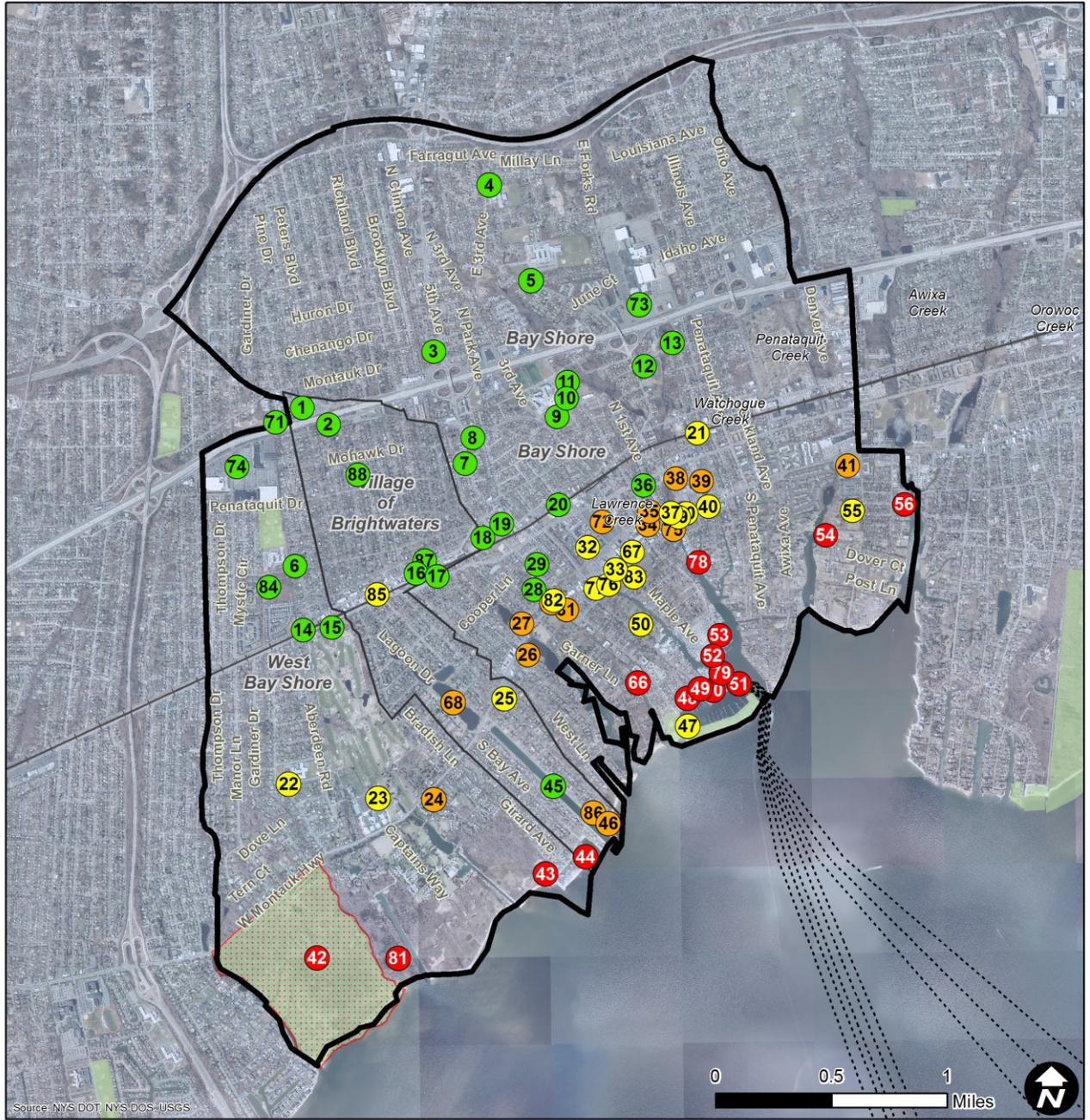
COLOR KEY:

Severe Risk Range
High Risk Range
Moderate Risk Range
Residual Risk Range

ID#	Name
Natural and Cultural Resources (continued)	
26	St. Luke's Church
27	Sagtikos Manor
30	St. Patrick Church (Hospitality Center)
31	Great South Bay YMCA
34	Bay Shore United Methodist Church
35	Second Avenue Firehouse
37	Old Mill Pond
47	Bay Shore Marina (Town of Islip)
76	George S. King Park
77	Community Reflection Garden
11	First Baptist Church
28	Bay Shore Jewish Center
36	First Congregational Church of Bay Shore
45	Brightwaters Canal



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Community Assets at Risk

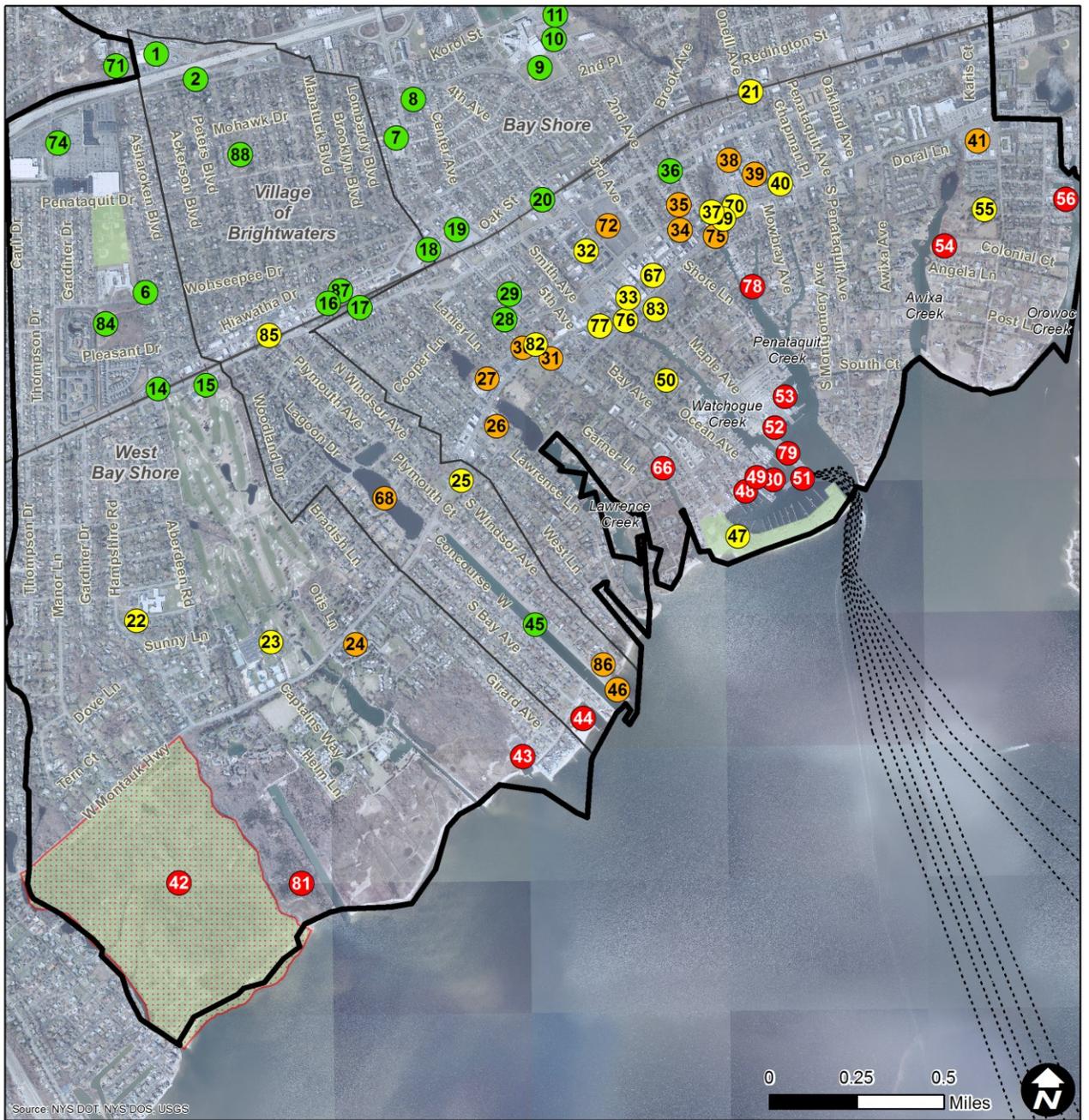
	Greater Bay Shore		Severe Risk
	NYRCR Planning Area		High Risk
	Village Boundary		Moderate Risk
	Ferry		Residual Risk
	Public Park		



Figure 3. Greater Bay Shore Risk Scores (Planning Area)



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Community Assets at Risk	
	Greater Bay Shore NYRCR Planning Area
	Village Boundary
	Ferry
	Public Park
	Severe Risk
	High Risk
	Moderate Risk
	Residual Risk



Figure 4. Greater Bay Shore Risk Scores (Detailed)



B. Assessment of Needs and Opportunities

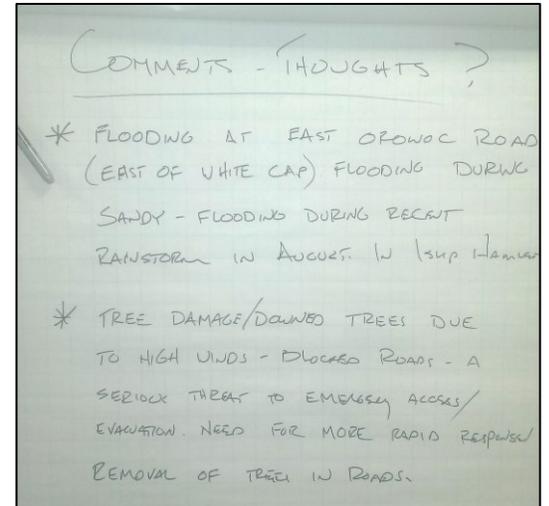
The Greater Bay Shore NYRCR Planning Committee initially identified needs and opportunities based on Greater Bay Shore’s reconstruction and economic development goals, existing plans and studies (including the eight Round I Community Reconstruction Plans in Suffolk County), and the Community’s overall vision for its resilient future.

The term “need” is used here to illustrate services and infrastructure that were damaged or rendered inoperable by Superstorm Sandy as well as methods and operations that failed to work adequately during the storm event. During a disaster, many things can go wrong, such as communications breakdowns, equipment failure, infrastructure damage, and more. As such, a need can include physical damage that is visible and obvious—such as the need to repair washed-out roads and storm-damaged houses. It can also include less visible impacts that can have an equally damaging effect on the Community—such as the loss of economic activity associated with businesses that were closed for weeks or months due to storm damage.

Thinking through what took place during the storm event, as well as what was damaged, provided the Committee with insights as to the inherent resiliency of those structures, procedures, and operations. This assessment process led to a pragmatic discussion of community needs and included recognition of changing climate patterns and the economic and practical necessity of factoring resiliency and adaptive capacity into recovery actions.

The term “opportunity” is based on the idea that additional resiliency benefits, whether economic, environmental, social or cultural, may be achieved through the integration of new methods, procedures, and materials into the normal course of rebuilding.

The post-disaster environment also presents opportunities to rebuild in ways that create a community that is stronger and more resilient to future storms. Resilient communities tend to have redundant infrastructure and communication systems, diverse and flexible adaptation strategies, and collaborative public and private partnerships. The Committee was mindful of this approach in keeping with the words of Governor Cuomo: “We’re not just going to build what was, we’re going to build to a level that was never before.”⁴⁴



Community members at Public Engagement Event 2 (September 2014) helped identify resiliency needs in Greater Bay Shore.

Source: Jacobs



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Throughout this NYRCR Plan, strategies and projects are categorized by their Recovery Support Functions (RSF). An RSF is an operational or coordinating structure first introduced by FEMA in 2011 in the “National Disaster Recovery Framework (2011)”.⁴⁵ The purpose of the RSF method is to support local governments by facilitating problem solving, improving access to resources, and fostering coordination among State and Federal agencies, nongovernmental partners and stakeholders. FEMA uses these RSFs to identify, coordinate, and ultimately deliver assistance to the Community from several different funding sources available in the recovery effort (e.g., Federal, State, private, philanthropic, and not-for-profit). The “Economic Development” RSF, for example, will help bring together the possible sources of assistance to achieve business resiliency through the projects identified by the Community.

The six RSFs are:

Recovery Support Functions (RSFs)

	Community Planning and Capacity Building	Implement storm recovery activities and plan to mitigate the effects of future storms.
	Economic Development	Return economic and business activities to a state of health and develop new economic opportunities that result in a stronger, more resilient community.
	Health and Social Services	Restore and potentially expand public health programs, health care facilities and essential social services, especially for vulnerable populations.
	Housing	Assess local housing conditions and associated risk levels during the re-building process.
	Infrastructure	Re-build capacities lost during storms and reduce future risks to critical assets.
	Natural and Cultural Resources	Rehabilitate, manage, and protect natural and cultural resources that define the community’s physical and human character.



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The following is a general discussion (by RSF) of the needs and opportunities that were identified by the Committee and Community at large.

Community Planning and Capacity Building

Greater Bay Shore would benefit from improvements to equipment used by life safety services/first responders. Currently, the Bay Shore Fire Department (BSFD) has two inflatable rafts without motors. These were acquired during Superstorm Sandy. During the storm firefighters had to pull the rafts by hand to rescue residents near the waterfront. This approach to high water rescue was further shown to be inadequate and potentially dangerous during the response to the severe thunderstorm of August 2014 when more than 13 inches of rain fell across the Town of Islip, including Greater Bay Shore. The BSFD was again called upon to evacuate residents and motorists utilizing the inflatable rafts. In this instance however, first responders needed to walk the rafts through water that was chest deep, thus were exposed to a number of hazards such as open manhole covers and drains which compounded an already dangerous environment with structure fires, live, burning and downed wires, and fallen trees.

Currently, the BSFD has a minimal level of back-up power supply at their three facilities. This is just sufficient to maintain operations at the central command center and to open and close the station bay doors. The provision of supplementary generators at these facilities would insure their ability to maintain ancillary operations such as housing and feeding their crews as well as sheltering displaced residents during storm and emergency events. Additionally, the BSFD uses a 400 MHz radio frequency, while the Bay Shore Brightwaters Rescue Ambulance uses a 100 MHz frequency and Suffolk County first responders typically use 800 MHz frequencies.⁴⁶ Improving emergency/public service communications would help facilitate first responder communication and coordination as well as emergency response times.

While the Greater Bay Shore community has an active civic life, the need to enhance communications across existing community organizations was identified by the Community as important. Following Superstorm Sandy and, most recently, during the record flooding of August 2014, the Community's residents and businesses experienced difficulty finding information about available shelters and reliable sources of basic necessities. The Community has a local civic group, the Bay Shore-Brightwaters Summit Council, composed



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of not-for-profits, school district representatives and community leaders. Steps to support either the Summit Council or a similar organization would provide the Community with seamless knowledge related to disaster preparedness and recovery resources.

On a more specific level, representatives from the Bay Shore Fire Department noted that they received many inquiries and donations from residents of the Community following Superstorm Sandy. They explained that while this was a commendable community response, it had the effect of overwhelming the fire department and began to interfere with their primary response mission. As such, this problem illustrates the need for improved communications within the Community regarding the coordination of overall response efforts beyond the immediate emergency rescue and fire response functions. The Summit Council or other community based organization could help to fulfill this need.

The Committee also noted the importance of the bayfront and the concentration of water-dependent uses (marinas and docks, ferry terminals) to the Community in terms of maintaining access (daily and in emergencies) to and from Fire Island. The completion of the Local Waterfront Revitalization Plan (Town of Islip) for the Greater Bay Shore Community would help to institute a comprehensive coastal management plan for the waterfront area.

Economic Development

The Community has worked collaboratively to reverse the economic decline of Main Street Bay Shore and reinvent the downtown. This collaboration has been active for the past two decades and, today, Greater Bay Shore has a thriving, walkable, downtown commercial core along Montauk Highway (Main Street). In addition, LJI Southside Hospital—an economic anchor in the Community—has grown to become a major regional medical facility. Associated with the growth of the hospital and its future expansion plans has been the development of a concentration of medical uses including a school of health sciences, additional diagnostic and treatment centers and increased numbers of private medical offices. In addition, the maritime industry continues to be an important part of the local economy. The Committee expressed the desire to extend this economic momentum especially given the recent loss of manufacturing jobs associated with the closures of locally-significant employers such as Entenmann’s and USA Industries, both



Figure 4. Waterfront Assets in Greater Bay Shore

Concentration of waterfront assets, marine transportation, and water-dependent uses in Greater Bay Shore.



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located within the Community but north of the NYRCR Greater Bay Shore Planning Area.

Bay Shore is the primary transportation gateway to Fire Island. By way of example, on a typical Saturday in September, over 70 ferry trips are made from the Bay Shore terminals to eight communities on Fire Island.⁴⁷ A large number of people travel between Bay Shore's LIRR Station and the ferry terminals. While these travelers generally take a taxi or walk south from the train station to the ferries via 4th Avenue/Maple Avenue, which is the most direct pedestrian route, they typically fail to spend a significant amount of time on Main Street. As such, the Committee has expressed the need to capture the tourism dollars of individuals travelling to and from Fire Island as a tool for economic growth. One effort that has already begun in this regard is an initiative by the Town of Islip to develop an enhanced pedestrian/bicycle path along 4th Avenue/Maple Avenue linking the train station, Main Street and the ferry terminals. The Committee also discussed the need to plan for more destination uses in the downtown that could encourage Fire Island visitor to spend more time and money in the Community.

Health and Social Services

Greater Bay Shore is a community with a proud history of supporting and assisting vulnerable and special needs populations. These populations range from seniors, the physically and mentally disabled, low-income, and English as a Second Language (ESL) communities. The need to plan for and support these communities before, during, and after emergencies and storm events is an important issue for the Greater Bay Shore Community.

LIJ Southside Hospital and the many ancillary health care uses that surround it are an integral part of the Community both for the services they offer and the employment that they provide. The hospital contains 341 beds and had over 17,000 admissions in the year ending in June 2014.⁴⁸ In addition, there were over 71,000 emergency room visits and about 152,000 outpatient treatment services provided by the hospital.⁴⁹ LIJ Southside Hospital is one of the anchors of a medical corridor that extends four miles west to Good Samaritan Hospital in West Islip. During Superstorm Sandy, several roads near the hospital were flooded in the vicinity of Penataquit Creek (intersection of Homan Avenue and Main Street). Flood waters during Superstorm Sandy also inundated the hospital parking lot - stopping just at the front door of the facility. The hospital also suffered millions of dollars of damage during the



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extreme flooding of August 13th and 14th 2014. The continuity of hospital operations is vital to vulnerable populations and the health of the Community at large. As a major employer in the Community, a fully-functioning hospital is also tied to the economic resiliency of Greater Bay Shore.

Housing

The housing stock in Greater Bay Shore, south of Montauk Highway especially near the bayfront (South Clinton Avenue, Maple Avenue, Ocean Avenue, Bay Avenue) is diverse with a blend of large-lot, single-family homes, apartments and townhouse-style construction, and single-story bayman cottages. Some of these cottages, many of which were built in the 1950s or earlier, were improved over time but not constructed to accommodate the practical needs of the older population that currently reside in some of these structures (Americans with Disability Act-compliance). Further, many of the homes pre-date current storm protection codes that require that buildings meet wind resistance standards and be built high enough above sea level to reduce the frequency of flood damage. Given the mixed-income nature of the bayfront area, the cost of such improvements may be out of the reach of many of the moderate and low income households in the area.

The introduction of mixed-use development in areas where commercial uses co-exist with residential uses, as appropriate (first-floor retail with apartments above) should be further explored. This type of development has been increasing in Downtown Bay Shore and has had a positive impact. Further development of this type of housing would help to attain the two-fold purpose of increasing the housing supply outside of what is typically considered to be a flood prone area and to promote a walkable and compact form of development.

Infrastructure

Several infrastructure issues were expressed by the Committee and local residents. The need to maintain clear, unimpeded access from Downtown Bay Shore to the ferries was crucial in terms of evacuation and the flow of commerce to and from Fire Island. Improved public access and pedestrian circulation between the docks and the commercial uses between Ocean Avenue and Bay Shore Marina Park was also mentioned as a need. Below Montauk Highway, there is a need to address recurring flooding in areas throughout Greater Bay Shore such as Shore Road East, Shore Road West and the Concourse East and West (Brightwaters) as well South



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Clinton Avenue, Ocean Avenue and Garner Lane (Bay Shore). Manatuck Lane, between Lawrence and Garner Lanes was undermined as a result of recent flooding, thus restricting access within this area.

The Community is realistic about the difficulties of preventing flooding similar to the magnitude resulting from Superstorm Sandy. At the same time, they want to find solutions to managing the flooding that occurs from common seasonal storms, nor-easters, and/or an extreme high tide. Additional critical infrastructure issues that were highlighted by the Committee include the need for reliable communications, and resiliency improvements to the utilities, fuel supply and pump stations so as to enable the provision of uninterrupted service.

Natural and Cultural Resources

The Committee has indicated that the Great South Bay is an integral part of the local economy and is also a regional natural resource as part of the South Shore Estuary Reserve. The Committee also noted the importance of Fire Island, the barrier island that separates the Great South Bay from the Atlantic Ocean and is the first line of defense for many types of coastal storms. Similarly important are the ecological health of the Great South Bay and Fire Island and an appreciation of the beaches, barrier islands, and wetlands along with the natural protection that these resources offer. The Community is supportive of all regional efforts to strengthen and rehabilitate the Great South Bay's ecology and Fire Island's natural protective landscape of dunes, beaches and marshes. These regional efforts include the findings and recommendations of the Suffolk County Comprehensive Water Resources Management Plan to improve surface water quality as a means of reversing the loss of tidal wetlands and sea grass, which are important elements of coastal storm protection.

The Community is cognizant of protecting their natural resources including restoration and enhancements to local creeks (i.e., daylighting Homan Creek). The reduction of pollutants that run off local streets and lawns and contaminate the local waters and the Great South Bay are a major local and regional concern. The Committee was also cognizant of the need to better manage stormwater entering into the local creeks in order to reduce the impacts of flooding associated with high rainfall events.



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Greater Bay Shore is within a Suffolk County Sewer District (Number Three, Southwest) and, as such, sanitary waste is collected and treated at the Bergen Point facility in West Babylon. The Community generally does not have on-site septic or cesspool systems. While this is a plus in many regards, it does place a great importance on the resiliency of the Bergen Point facility. The plant is in a coastal location on a parcel adjacent to the Great South Bay and is vulnerable to inundation and damage from storm surges. As such, efforts to harden the plant are very important to Greater Bay Shore similar to many other communities that are connected to the plant.

Greater Bay Shore has expressed the importance of its historic resources and the significance of these sites to the identity of the Community (United Methodist Church, 2nd Avenue Fire House, Sagtikos Manor, etc.). The Committee is supportive of preserving these resources and accentuating them as opportunities for increased tourism as a means of economic resiliency.

Table 20. Needs and Opportunities for Greater Bay Shore

Community Planning and Capacity Building
<p>Need: Improved emergency information procedures and mechanisms used by first responders.</p> <p>Opportunity: Improve emergency management and first response system.</p>
<p>Need: Adequately equipped first responders with appropriate search and rescue equipment.</p> <p>Opportunity: Capitalize on storm and rescue experiences of first responders including high-water rescues over the last two years.</p>
<p>Need: Support for not-for-profit and community organizations in their ability to effectively respond to disaster relief activities.</p> <p>Opportunity: Establish and/or strengthen communications and services across organizations.</p>
<p>Need: Coastal management planning.</p> <p>Opportunity: Consider the completion of a Local Waterfront Revitalization Plan.</p>
Economic Development
<p>Need: Continued growth in local tax base, new jobs, and greater resiliency of the economy.</p> <p>Opportunity: Maintain economic base of business in the Village of Brightwaters and extend economic momentum related to medical corridor, Main Street, and marina area in Bay Shore.</p>



Table 20. Needs and Opportunities for Greater Bay Shore (Cont'd)

Economic Development (Cont'd)
<p>Need: Improved integration of commercial, recreational, and tourism assets and functions.</p> <p>Opportunity: Utilize strategies that can build upon and improve synergies within the Business Improvement District and/or Main Street between local businesses and tourism (to and from Fire Island).</p>
<p>Need: Improved resiliency and continuity of waterfront businesses.</p> <p>Opportunity: Implement policies, plans, incentives to further support water-dependent marine economic activity and consider the appropriateness of additional water-enhanced commercial uses to improve economic diversity.</p>
Health and Social Services
<p>Need: Improved outreach and assistance to special needs populations before, during, and after emergency events.</p> <p>Opportunity: Develop a plan to identify special needs populations (e.g., elderly, children, individuals with disabilities, non-English speaking) and plan for their unique requirements while recognizing the diverse mix of age groups, ethnic backgrounds, and abilities.</p>
<p>Need: Ensured continuity of services at LIJ Southside Hospital and other supporting medical facilities. Assured access to Good Samaritan Hospital for West Bay Shore residents.</p> <p>Opportunity: Reduce on-site flooding and flooding along adjacent roadways and ensure continuity of power supply.</p>
Housing
<p>Need: Improved or expanded relocation opportunities, where appropriate, for those (including vulnerable populations) located in extreme and high risk areas.</p> <p>Opportunity: Facilitate the introduction of mixed-use development related to economic revitalization in non-risk areas.</p>
<p>Need: More safe, resilient housing in flood prone areas that meet the needs of the Community.</p> <p>Opportunity: Use best practices to address physical and practical aspects of raising older, large, or potentially historic houses (senior, ADA-compliant access).</p>



Table 20. Needs and Opportunities for Greater Bay Shore (Cont'd)

Infrastructure
<p>Need: Clear, unimpeded access from Downtown Bay Shore and adjoining roadways to ferries for the purpose of facilitating evacuation and uninterrupted commerce.</p> <p>Opportunity: Provide enhanced pedestrian connections and incorporate “Complete Streets” components to help alleviate flooding that restricts access near marina area.</p>
<p>Need: Minimize localized flooding on roadways.</p> <p>Opportunity: Improve storm drainage capacity and facilities.</p>
<p>Need: Protect utilities/fuel supply/wastewater infrastructure in a manner that allows for uninterrupted service and quick recovery.</p> <p>Opportunity: Investigate options to harden fuel supply and improve the resiliency of pump stations (through the provision of continuous power).</p>
<p>Need: Reliable communications systems.</p> <p>Opportunity: Strengthen and/or improve communication systems (low and high tech solutions).</p>
<p>Need: Reduce roadway flooding and improve emergency and hospital access as well as evacuation routes.</p> <p>Opportunity: Improve emergency access and evacuation routes.</p>
<p>Need: Improve public ability to circulate within the waterfront area.</p> <p>Opportunity: Provide better public and pedestrian access between docks and water-enhanced uses in Greater Bay Shore.</p>
Natural and Cultural Resources
<p>Need: Protect and enhance natural systems to improve flood protection, stormwater retention, and water quality.</p> <p>Opportunity: Restore the natural ecosystem and improve the storm water capacity of streams and waterbodies.</p>
<p>Need: Preserve historic resources in Greater Bay Shore.</p> <p>Opportunity: Consider resilient reuse and flood protection strategies.</p>



Section III: Reconstruction and Resiliency Strategies

Introduction

The process of identifying the Community's post-storm needs and opportunities informed the Committee's development of strategies. In turn, the strategies helped conceptualize and design projects to specifically address these needs and opportunities.

Strategies are approaches to types of projects, programs, policies, or other actions that specifically address an identifiable need. Typically, there can be multiple strategies to address a given need. For example, communities are most successful when they blend traditional repair and stabilization actions with a holistic, long-range, forward-looking view of recovery and economic development. This section presents the strategies developed by the Greater Bay Shore NYRCR Planning Committee for how best to use community assets, capitalize on opportunities, and resolve critical issues.

For each need or opportunity, potential strategies were generated for the various resiliency issues. The list of strategies spans an array of methodologies and timeframes, from preparedness to auxiliary power retrofits, from immediate procedural improvements to long-range capital investment programs. In addition, strategies include conservation of natural protective features, building code revisions and regulatory changes, structural defenses, resiliency retrofits, economic development, land use planning, and education and outreach to employ multiple, complementary actions rather than relying on a single means of protection.

Careful consideration was given to what is at risk, what resources are available and the capacity to implement various management measures. As general resiliency strategies evolved into specific projects and actions, several factors were considered to begin identifying the most feasible and effective strategies, and thus identify the best use of Sandy recovery funds. These considerations included how each strategy relates to Superstorm Sandy's impacts on Greater Bay Shore; the extent to which each strategy would reduce current and projected risk; and whether it contributed to the protection of vulnerable populations. Other considerations included



the feasibility of a successful implementation; compliance with existing regulations and codes; upfront and long-term maintenance costs; direct and indirect benefits; and public perception.

A. Recovery Support Functions

The strategies outlined below (and discussed in Section II) meet one or more Recovery Support Functions (or RSFs). FEMA uses these RSFs to identify, coordinate, and ultimately deliver assistance to the Community from several different funding sources potentially available in the recovery effort, e.g., Federal, State, private, philanthropic, and not-for-profit. These RSFs were used to organize and inform needs, opportunities, strategies, and ultimately projects to ensure that a wholistic, pragmatic approach was used to shape comprehensive resiliency strategies for the Community.

Community Planning and Capacity Building strategies present ways the Community will restore or enhance its ability to organize, plan, manage, and implement recovery. In Greater Bay Shore, improving the ability of emergency service providers to respond effectively during and after storm events is a strategy intended to improve public safety as well as the overall resiliency of the Community.

Economic Development strategies are intended to offer ways in which the Community will return economic and business activities to a state of health, and to develop new economic opportunities. A healthy local economy can help to make a Community more resilient and improve its ability to recover after a storm event. Economic strategies specific to Greater Bay Shore also focused on building on the existing momentum of both the downtown and waterfront economies as well as improving opportunities for growing the area's industrial base. These strategies included increasing synergies between businesses in the BID and tourist/residents on Fire Island.

Health and Social Services strategies are intended to address how the Community will restore and manage the essential social and health services, particularly those that serve vulnerable populations. During Sandy and other storms, access to LIJ Southside Hospital was compromised as a result of flooding on Main Street and other nearby roadways. The hospital's extensive service area includes the communities of Fire Island, North Bay Shore, Brentwood and Central Islip. LIJ Southside also provides services to many vulnerable populations who have no other means of accessing health care in

THROUGHOUT THIS REPORT THE ICONS ASSOCIATED WITH THESE RSFs HAVE BEEN DISPLAYED IN ASSOCIATION WITH STRATEGIES AND PROJECTS TO PROVIDE CONTEXT AND TO REINFORCE THE RELATIONSHIP TO THIS FEDERAL ORGANIZATIONAL STRUCTURE.



COMMUNITY PLANNING AND CAPACITY BUILDING



ECONOMIC DEVELOPMENT



HEALTH AND SOCIAL SERVICE



HOUSING



INFRASTRUCTURE



NATURAL AND CULTURAL RESOURCES



the region. Strategies related to improving access to health care facilities would help to ensure continuity of service.

Housing strategies typically address how to provide for post-disaster housing needs in the context of supply, accessibility and affordability. Housing strategies also include how a community will promote the availability of affordable housing to people impacted by the storm. In Greater Bay Shore, the housing strategy addresses how the Community will encourage safe and resilient housing for all residents.

Infrastructure strategies generally convey how a community will repair, restore, and manage essential services. This RSF addresses new investments that would most effectively improve services to the Community or restore and/or improve drainage systems to pre-storm levels. In Greater Bay Shore, improvements to the natural and engineered stormwater management system (as well as watershed drainage and artificial lakes) will be crucial to reducing flood risk to vital evacuation/access routes. The repair and addition of hard infrastructure along the Brightwaters Canal was also suggested by the Committee to alleviate recurring flooding.

Natural and Cultural Resources strategies address the management of natural and cultural resources from a risk reduction perspective. Improving the stormwater management system in the Community will benefit infrastructure (e.g., improved drainage) and community and capacity building benefits (e.g., improved access/clear evacuation routes) as well as natural and cultural resource benefits related to a reduction in pollutant loading to surface waters, which is a local and regional concern across Long Island.

B. Reconstruction and Resiliency Strategies

The resiliency strategies developed by the Committee, were derived from a review of the inventory of assets identified as being at risk and of Community importance relative to the Community's needs (see Section II of this document). Additionally, the Committee considered the issues, needs and opportunities of the Community in developing appropriate strategies. Each strategy was designed to take into account the following considerations:

- Whether it reduced the level of risk and met an identified Community need;



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- Whether it helped or improved the resiliency of vulnerable populations; and,
- Whether it could be implemented through discrete programs and/or projects.

The following pages present the strategies developed by the NYRCR Planning Committee as well as a discussion of the needs and opportunities within the Greater Bay Shore Planning Area that they address.

Strategy: Ensure public safety and the ability of first responders to promptly and effectively react to severe storm events and other emergencies.



Emergency responders in Greater Bay Shore were taxed by extensive evacuation and recovery demands during and after the storm. Their ability to react during Superstorm Sandy was compromised on several fronts including a lack of efficient command and control communications and a lack of sufficient power at base facilities. Improved communication was a major need during the storm, especially for the BSFD because its antiquated communications equipment operates on a different frequency from that of other first responders in the immediate area (Suffolk County Office of Emergency Management, Town of Islip, etc.).

Additionally, during field operations, the BSFD lacked the appropriate rescue equipment needed to meet the evacuation and recovery demands generated during and after the storm. Many of these water rescues occurred on South Clinton Avenue and surrounding streets which are home to vulnerable populations (elderly, Low Moderate Income).

This strategy addresses resiliency needs related to both Community Planning and Capacity building as well as Health and Social Services. Improved communication for first response providers in the event of a storm event would result in improved emergency response time that could result in reduced property damage or total loss and also lower the risk of injury.

Enhanced provision of public safety services including assistance to special needs populations before, during, and after emergency events would address risk by ensuring the efficient provision of critical life safety and emergency services throughout the



Greater Bay Shore NY Rising Community Reconstruction Plan

Community, particularly in flood prone areas south of Montauk Highway. This strategy is relevant to all residents of Greater Bay Shore but particularly benefits elderly populations who have special needs regarding mobility and access to emergency health care services. Proposed Projects developed to implement these strategies are described in Table 21.

Table 21. Strategy: Ensure public safety and the ability of first responders to promptly and effectively react to severe storm events and other emergencies.

Project Name	Short Description	Estimated Cost	Project Category	Regional (Y/N)
Fire and Rescue Communications	Upgrade communications equipment to eliminate technical deficiencies and incompatibility of equipment among first response agencies (such as Suffolk County OEM).	\$640,000	Proposed	Y
Fire and Rescue Equipment	Purchase of high-water Search and Rescue equipment.	\$168,000	Proposed	Y
Enhanced GIS Emergency Management System	Project to enhance a Town-wide GIS system to improve storm response and recovery.	\$50,000	Proposed	Y
Greater Bay Shore Resiliency Generator Project	Place permanent fixed generators at crucial community facilities including: BSGD Headquarters, Brightwaters Village Hall, YMCA, Bay Shore High School, Town of Islip's 2 nd Avenue Highway Yard, and Maple and Ocean Avenue Docks.	\$1,425,000	Proposed	Y

Strategy: Ensure adequate resources to enhance the use of Community-Based Organizations (CBOs) to prepare for and respond to local emergencies.



Greater Bay Shore is a socially-responsible community that is actively engaged in civic life. There are a multitude of civic organizations and non-profit groups in the Community ranging from the Summit Council to the Chamber of Commerce to the Great South Bay YMCA. The Community-Based Organizations (CBOs) of Greater Bay Shore provided critical services before, during and in the aftermath of Superstorm Sandy. Many organizations were staffed by residents, volunteers, and dedicated employees whose



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actions were instrumental in ensuring the well-being of those in need. Services provided included evacuation assistance, medical care, temporary shelter and refuge, mental health assistance, and the provision of food, water, clothing, and showers.

Historically, a key focus of many of the CBOs has been to provide assistance to vulnerable populations within the Community. To that end, this strategy will help the CBOs to address the pre- and post-storm needs of vulnerable populations within Greater Bay Shore.

While the CBO effort was vital to the Community's recovery, both the Committee and the public indicated that there was a need for coordination among the organizations as well as a comprehensive plan for the roles of the organizations, responsibilities, and available resources to assist the Community before, during, and after the storm. For example, many Community residents did not know that the YMCA on Main Street provided on-site services such as meals and showers. Meanwhile, the BSFD Headquarters was overwhelmed by donations of food, clothing, and supplies which could have compromised their primary life safety and rescue responsibilities.

This strategy addresses resiliency issues related to Community Planning and Capacity Building as well as Health and Social Services by enhancing emergency preparedness and response management. It is also intended to improve the efficiency of CBOs by considering coordination of similar services or opportunities for reducing potential duplication of services (i.e., same resources offered at the YMCA and Bay Shore High School). In addition, the strategy aims to increase public awareness (i.e., where to go, what to do, and who does what in which situation) and knowledge of risk management.



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Table 22. Strategy: Ensure adequate resources to enhance the ability of Community-Based Organizations (CBOs) to prepare for and respond to local emergencies.

Project Name	Short Description	Estimated Cost	Project Category	Regional (Y/N)
Community Based Organizations (CBO) & Vulnerable Population Emergency Action & Education Plan	Develop a plan to enable CBOs to coordinate their efforts to address emergency preparedness education, evacuation, and long-term resiliency needs of vulnerable populations during and after severe weather events and emergency situations.	\$475,000	Proposed	Y
Greater Bay Shore Resiliency Generator Project	Permanent placement of fixed generators at crucial community facilities including: BSFD Headquarters, Brightwaters Village Hall, YMCA, Bay Shore High School, Town of Islip's 2 nd Avenue Highway Yard, and Maple and Ocean Avenue Docks.	\$1,425,000	Proposed	Y

Strategy: Improve the economic resiliency of the Community.



A strong local businesses base can help to make a community more resilient in recovering from a storm event. This strategy addresses the need to maintain economic momentum as well as continue to implement economic development policies, programs, and plans to enhance the downtown commercial core and complement the maritime nature of Greater Bay Shore, while also recognizing its vulnerability during weather events such as Superstorm Sandy.

Improving economic resiliency requires evaluating some of the Community's most promising commercial areas and recommending actions to diversify the economy and attract consumers, which will help to promote the Community, boost job creation, improve tax rates and ensure the resiliency of the local tax base. Implementing this strategy requires capturing tourism dollars from the almost 1.5 million visitors that pass through Bay Shore en route to Fire Island.



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Finally, this strategy encompasses areas outside identified risk areas, beyond the floodplain, which could serve the Community during and after severe weather events that might compromise coastal businesses. This strategy addresses resiliency issues related to the Economic Development RSF.

Table 23. Strategy: Improve the economic resiliency of the Community.

Project Name	Short Description	Estimated Cost	Project Category	Regional (Y/N)
Bayview Avenue, Bay Shore Waterfront Corridor Improvement	“Complete Streets” improvements on Bayview Avenue between Ocean Avenue and South Clinton Avenue. “Green” infrastructure technology and permeable pavement could be incorporated to the extent possible. Project would improve parallel access to waterfront businesses and also provide another route to evacuate from the waterfront.	\$1,300,000	Featured	N

Strategy: Provide for the unique needs and requirements of vulnerable populations including the elderly, individuals with disabilities, and low income residents.



Greater Bay Shore is home to a diverse mix of ethnicities, age groups and vulnerable populations. As a result of circumstances (age, employment status) and/or conditions (physical mobility, language/cultural barriers), vulnerable populations have additional difficulties before, and during storm events as well as after in terms of the ability to bounce back from these emergency situations. Vulnerable populations are at risk of being isolated both geographically and systemically (e.g., not well integrated into the health care system). This isolation puts these populations at risk of not receiving appropriate services or medical care.

In Bay Shore, the Atria Senior Living on Ocean Avenue houses approximately 150 elderly residents. This facility and the roadway, both located south of Montauk Highway, were subject to flooding during Superstorm Sandy. By all intents, this facility should have



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been evacuated, however Atria staff were unable to find a suitably equipped facility to which to evacuate their residents. Nor did they possess sufficient transport equipment to safely move their elderly population during Superstorm Sandy.

The intent of this strategy is to respond to the need for increased emergency preparedness relative to vulnerable populations before a storm event, and to improve this population’s ability to access services during an event as well as to respond to a storm event in a tailored, well-organized manner specific to their needs.

Table 24. Strategy: Provide for the unique needs and requirements of vulnerable populations including elderly, individuals with disabilities, and low income residents.

Project Name	Short Description	Estimated Cost	Project Category	Regional (Y/N)
Community Based Organizations & Vulnerable Population Emergency Action Plan (EAP)	Develop a plan to enable CBOs to coordinate their efforts to address emergency preparedness education, evacuation, and long-term resiliency needs of vulnerable populations during and after severe weather events and emergency situations.	\$475,000	Proposed	Y
Penataquit Village Housing Resiliency Enhancements	Drainage and storm water quality improvements including the use of “Green” technology (vegetated swale) would help this residential development which caters to LMI, elderly, individuals with disabilities, and families. In addition, this project would help to improve the resiliency of existing commercial and residential uses located downstream of Penataquit Village along Penataquit Creek.	\$235,000	Proposed	N
Bayview Avenue, Bay Shore Waterfront Corridor Improvement	“Complete Streets” improvements on Bayview Avenue between Ocean Avenue and South Clinton Avenue. “Green” infrastructure technology and permeable pavement could be incorporated to the extent possible. Project would improve parallel access to waterfront businesses and also provide another route to evacuate from the waterfront.	\$1,300,000	Featured	N



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Strategy: Encourage safe and resilient housing for all residents.



The Committee identified a need for safe housing and this strategy generally addresses how to provide for post-disaster housing needs in the context of supply, accessibility and affordability. Housing strategies also include how a community will promote the availability of affordable housing to people impacted by the storm.

Penataquit Creek overtopped its banks during Superstorm Sandy, which exacerbated flood conditions along this particular stream corridor. Residential developments, such as Penataquit Village, which caters to LMI, elderly, individuals with disabilities, and families, experienced significant flooding thereby endangering vulnerable populations. Since the creek traverses Penataquit Village, improvements in the area of this development would not only improve the resiliency Penataquit Village itself, but also the resiliency of existing residential and commercial uses located downstream along Penataquit Creek.

Table 25. Strategy: Encourage safe and resilient housing for all residents.

Project Name	Short Description	Estimated Cost	Project Category	Regional (Y/N)
Penataquit Village Housing Resiliency Enhancements	Drainage and storm water quality improvements including the use of “Green” technology (vegetated swale) would help this residential development which caters to LMI, elderly, individuals with disabilities, and families. In addition, this project would help to improve the resiliency of existing commercial and residential uses located downstream of Penataquit Village along Penataquit Creek.	\$235,000	Proposed	N



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Strategy: Ensure continuity of service and access to critical health care facilities and to public safety services.



Currently, a number of locations within Greater Bay Shore are prone to reoccurring and frequent flooding. By all indications this has been exacerbated by Superstorm Sandy. These locations either have damaged or inadequate storm drainage facilities. Localized flooding also impacts transportation and access along crucial roadways within the Community. At present, significant areas along (en route to LIJ Southside Hospital) and south of Montauk Highway experience localized flooding (South Saxon Avenue, Homan Avenue, Homan Place, Mowbray Avenue and Mowbray Place) as a result of these inadequacies. Homes and vehicles suffer damage and access for residents and businesses and emergency services is compromised.

The Committee indicated that access to LIJ Southside Hospital was of the highest importance as it is a major medical center in the area and also a significant regional employer. During Superstorm Sandy, access to LIJ Southside and its neighboring medical and support offices was severely compromised during to flooding. Improvements to this area of Main Street as well as other local roadways would ensure access during times of emergency and allow the healthcare uses along this corridor to continue to expand.

Table 26. Strategy: Ensure continuity of service and access to critical health care facilities and to public safety services.

Project Name	Short Description	Estimated Cost	Project Category	Regional (Y/N)
Drainage, Roadway & Utility Infrastructure Initiative	This initiative would undertake the design, engineering, and hydrologic study of 5 locations including portions of: Main Street, Lawrence Lane, Concourse West, South Saxon Avenue, South Court between Awixa Avenue and Penataquit Avenue.	\$1,375,000	Featured	N



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Strategy: Integrate “Green” and “Gray” infrastructure (natural and engineered stormwater management system) to holistically manage stormwater and reduce flooding.



During Superstorm Sandy, significant flooding occurred not only at the shorefront areas, but also in the vicinity of Main Street, Homan Avenue, and other streets surrounding the LIJ Southside Hospital campus, thereby restricting vehicular, pedestrian, and emergency vehicle access to LIJ Southside Hospital. Superstorm Sandy caused significant damage to the storm sewer system and to residences located south of Montauk Highway. In addition, flooding from the Great South Bay, Penataquit Creek also overtopped its banks, thus exacerbating flood conditions surrounding the Hospital. The storm surge also came up through the storm drainage system and flooded streets and homes south of Montauk Highway.

Typically, water infrastructure may be considered to be “Green” or “Gray”. Gray infrastructure generally refers to traditional practices for stormwater management and wastewater treatment, such as sewers and pipes. “Green” infrastructure refers to sustainable pollution reducing practices that also provide other ecosystem benefits like reduced greenhouse gas emissions or increased flood control. Green infrastructure typically uses porous materials, permeable pavement, planted buffers, and rain gardens.

In order to mitigate repetitive flooding and optimize storm water management, this strategy focuses on either preserving natural permeable ground cover for stormwater and water quality management or restoring such cover where it has been lost. The strategy would increase safety along the shore front and streams by reducing flooding. This strategy addresses resiliency issues related to the Infrastructure RSF.

This strategy is intended to lower risk for residents of the Community by creating a long-term, cohesive plan to address recurring flooding in Greater Bay Shore. Projects within the strategy are designed to address immediate needs followed by a long-term approach to upgrades, repairs, and maintenance. This strategy is relevant to vulnerable populations of the Community, especially those living south of Montauk Highway (Atria Senior Living, LMI populations in the vicinity of South Clinton Avenue), since the



Greater Bay Shore NY Rising Community Reconstruction Plan

current flooding damages property, restricts access, and impairs the safety of the elderly and individuals with disabilities.

Table 27. Strategy: Integrate “Green” and “Gray” infrastructure (natural and engineered stormwater management system) to holistically manage stormwater and reduce flooding.

Project Name	Short Description	Estimated Cost	Project Category	Regional (Y/N)
Stream Corridor & Lakes Drainage Capacity Improvement Initiative	<p>This project involves the undertaking of a comprehensive drainage study and design for six creeks (Trues, Lawrence, Watchogue, Penataquit, Awixa, and Orowoc).</p> <p>The study would undertake an engineering analysis to identify the specific drainage areas associated with each creek, the potential volumes of water that could be expected during severe events (100-year, 500-year storms) and the capacity of the streams to convey that water. Based on this analysis, the study would identify specific actions that could be undertaken to improve the streams ability to convey and store storm water while also improving water quality and wildlife habitat.</p> <p>This initiative would also include the Brightwaters Artificial Lakes Storm Water Drainage Assessment (Study & Design) to evaluate the capacity of the artificial lakes in the Village.</p>	\$1,917,000	Proposed	Y
Penataquit Village Housing Resiliency Enhancements	<p>Drainage and storm water quality improvements including the use of “Green” technology (vegetated swale) would help this residential development which caters to LMI, elderly, individuals with disabilities, and families. In addition, this project would help to improve the resiliency of existing commercial and residential uses located downstream of Penataquit Village along Penataquit Creek.</p>	\$235,000	Proposed	N



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Table 27. Strategy: Integrate “Green” and “Gray” infrastructure (natural and engineered stormwater management system) to holistically manage stormwater and reduce flooding. (Cont’d)

Project Name	Short Description	Estimated Cost	Project Category	Regional (Y/N)
Drainage, Roadway & Utility Infrastructure Initiative	This initiative would undertake the design, engineering, and hydrologic study of 5 locations including portions of: Main Street, Lawrence Lane, Concourse West, South Saxon Avenue, South Court between Awixa Avenue and Penataquit Avenue.	\$1,375,000	Featured	N
Great Cove Watershed Improvements	<p>Design & implementation of watershed improvements at four locations in Greater Bay Shore. These projects were included as part of the Great Cove Watershed Study</p> <ul style="list-style-type: none"> • Montauk Highway at Lawrence Creek (\$175,000) • Mechanicsville Road Parking Area, Watchogue Creek (\$175,000) • Gibson Street Parking Area, Watchogue Creek (\$414,000) • Maple Avenue Dock, Watchogue Creek (\$1,323,000 cost provided by Town of Islip) <p>Projects involve the construction of bi-retention basins, improvements and installation of stormwater discharge treatment structures, increased use of permeable paving and vegetated natural areas. Maple Avenue Dock involves regrading parking lot, drainage improvements and potential raising of the top of the bulkhead.</p>	\$2,117,000	Featured	Y



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Table 27. Strategy: Integrate “Green” and “Gray” infrastructure (natural and engineered stormwater management system) to holistically manage stormwater and reduce flooding. (Cont’d)

Project Name	Short Description	Estimated Cost	Project Category	Regional (Y/N)
Stream Corridor & Lakes Drainage Capacity Improvement Implementation	<p>Implementation of recommendations identified under the Stream Corridor & Lakes Drainage Capacity Improvement Initiative at the following locations:</p> <ul style="list-style-type: none"> • Trues Creek (\$867,000) • Lawrence Creek (\$91,000) • Watchogue Creek (\$574,500) • Penataquit Creek (\$2,392,000) • Awixa Creek (\$508,000) • Orowoc Creek (\$1,340,000) <p>The Brightwaters Artificial Lakes Storm Drainage Capacity Assessment is a management study and the implementation of physical improvements to the lake system is not included in this project.</p>	5,772,500	Featured	Y

Strategy: Mitigate flooding from the Great South Bay.



This strategy predominantly addresses the Infrastructure RSF and the need for flood control caused by tidal surges associated with major weather events such as nor’easters and hurricanes. It is intended to reduce risk to properties along Concourse East and West which front the Brightwaters Canal and are subject to frequent flooding in part due to compromised bulkhead protection and the low elevations of roadways. Superstorm Sandy caused significant damage to the public bulkhead system at municipal docks in Bay Shore and the Village’s Brightwaters Canal and eroded the shore behind them. Homes, docks, restaurants, and streets sustained up to four feet of water as the sea flooded low lying streets and overtopped the bulkhead system.



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This strategy also addresses the Economic RSF because the revenue producing function of the Village-owned Canal (ability to collect mooring/transient dockage fees) is crucial to the economic resilience of the Village. One phased project, identified below, was developed to address this strategy.

Table 28. Strategy: Mitigate flooding from the Great South Bay.

Project Name	Short Description	Estimated Cost	Project Category	Regional (Y/N)
Brightwaters Canal Improvements: Phase I	The first of three phases (500 linear feet per phase) for the replacement of deteriorating or damaged bulkheading along portions of the Brightwaters Canal. This project could help to ease flooding on Montauk Highway and also benefit the Southwest Sewer District pump station near Walker Park. Phases II & III are included under Featured Projects.	\$677,000	Proposed	N
Brightwaters Canal Improvements: Phases II & III	Phases II & III (500 linear feet per phase) for the replacement of deteriorating or damaged bulkheading along the canal.	\$1,354,000	Featured	N



Section IV: Implementation – Project Profiles

Introduction

This section provides a complete Project Profile for each Proposed Project and Featured Project identified by the Greater Bay Shore NY Rising Community Reconstruction (NYRCR) Planning Committee and the Community.

The NYRCR Program has allotted to the Community up to \$3 million. 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, the Greater Bay Shore Planning Committee took into account the effectiveness of each project in reducing risk to populations and critical assets, the project’s feasibility, and the level of public support. The Committee also considered cost-benefit analyses and cost estimates for each project as well as the likelihood that a project would be eligible for CDBG-DR funding.

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 the NYRCR Plan does not necessarily indicate the Community’s prioritization of these projects and actions. **Proposed Projects** are projects proposed for funding through Greater Bay Shore’s allotment of CDBG-DR funding (up to \$3 million). **Featured Projects** are projects and actions that the Greater Bay Shore Planning Committee has identified as important for the Community’s future resiliency recommendations but not currently proposed for funding through the NYRCR Program. **Additional Resiliency Recommendations** (see Section V, Table 29) 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 exceed the Community’s CDBG-DR allotment to allow for flexibility if some Proposed Projects cannot be implemented due to environmental compliance issues, 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 the NYRCR Plan does not

RECOVERY SUPPORT FUNCTIONS



COMMUNITY PLANNING AND CAPACITY BUILDING



ECONOMIC DEVELOPMENT



HEALTH AND SOCIAL SERVICES



HOUSING



INFRASTRUCTURE



NATURAL AND CULTURAL RESOURCES



guarantee that a particular project or action will be eligible for CDBG-DR funding or that it will be implemented.

As noted earlier, the profiles include information on two crucial elements utilized by the Committee to evaluate the value of each project: a Cost-Benefit Analysis and a Risk Reduction Analysis. Before proceeding to the projects themselves, it is important to understand these two analytical elements of the Project Profiles.

Cost-Benefit Analysis

A cost-benefit analysis (CBA) is a tool used to calculate and compare the benefits and costs associated with a project. The CBA provides decision-makers with a framework for comparing different projects (i.e., anticipated cost of implementation against total expected benefits), and determining whether the benefits of a particular project outweigh the costs. More specifically, the value of the CBA is two-fold: (1) to inform the selection of projects for implementation; and (2) to support applications for funding.

To aid in the selection of projects, the Committees, State, and Consultant Team evaluated projects in accordance with the following criteria:⁵⁰

- **Feasibility:** Examines the feasibility of a project from a technical and regulatory perspective, such as does the project:
 - Use known and/or suitable technology?
 - Use practical construction methods?
- **Cost:** A conceptual cost estimate for each Proposed/Feature Project looks at a number of metrics including:
 - Unit and life-cycle costs; and
 - Useful life of the project.
- **Risk Reduction:** Estimating the amount of risk that is reduced in the Community relative to the initial level of risk quantified by the State’s Risk Assessment Tool (Section V, Table 34).
 - Assets secured;
 - Critical infrastructure secured; and
 - Lives secured.
- **Co-Benefits:** Co-benefits include those that extend beyond risk reduction criteria. These benefits may include:



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- Economic;
 - Environmental; and
 - Health and Social.
- **Degree of Public Support:** This metric is derived through community engagement, agency engagement, and the degree to which the project conforms to regional planning initiatives as well as support across multiple communities.
 - **Funding Availability:** Funding availability will be determined by a review of available funding sources and program requirements through CDBG-DR, FEMA resiliency actions, State and local funding as well as other sources.

All of the Proposed Projects and Featured Projects described in the Project Profiles section happen to meet the Long Island Regional Economic Development Council's (LIREDC) key strategy related to sustainability and resiliency (see text box at right). In addition, many of the Proposed Project's align with the Cleaner Greener Long Island Regional Sustainability Plan (CGLI) Plan which represents a community-based, collaborative effort for a more sustainable future. Proposed Project consistency with water quality goals identified in the Long Island South Shore Estuary Reserve Comprehensive Management Plan as well as other LIREDC strategies are noted, as applicable. Refer to Section I: Community Overview, E. Relationship to Regional Plans for a summary of the studies noted above.

The NYRCR Program was a community-driven process. The CBA was focused on identifying project costs and benefits that easily relate to the Community that the NYRCR Planning Committee represents. Community and Committee input-informed by a true understanding of local conditions, needs and community values-played a crucial role in the selection of projects. With this in mind, the CBA contains a mix of both quantitative and qualitative factors in its analysis.

Estimated Project Costs

Project Profiles include a description of anticipated costs, including soft costs, contingency costs, and the hard costs associated with implementation (e.g., labor and materials). Soft costs refer to costs associated with design, procurement, permitting or any other "up-front" costs associated with project implementation (up to 25% of construction costs depending on the complexity of the project). Contingency costs refer to additional costs that have been factored

REGIONAL ECONOMIC DEVELOPMENT COUNCIL (REDC) KEY STRATEGY

Protect Long Island from the perils of climate change at the same time we encounter new "cleaner, greener" industries by leading collaborative regional efforts to harden our infrastructure, businesses and homes against the next major storm and to encourage transportation, energy, and construction policies that reduce our vulnerability, as well as our carbon footprint.

CLEANER GREENER LONG ISLAND REGIONAL SUSTAINABILITY PLAN

Important goals contained in this plan which are consistent with sustainability and resiliency include:

- *Economic Development:* Advance Superstorm Sandy recovery and rebuilding to manage future economic risks.
- *Land Use and Livable Communities:* Increase the resiliency of coastal development.
- *Water Management: Control:* flooding and surface water pollution from stormwater runoff.



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into a project (up to 25% of construction costs) due to the conceptual nature of the projects and the potential for cost escalations due to unknowns.

The CBA cannot, however, anticipate costs or benefits with complete certainty; rather, the CBA provides the Community with a practical understanding of the potential estimated costs of project implementation and the potential benefits that would accrue to the community with the particular project in place.

The cost of implementing a project is just one aspect of the justification for funding these projects. Conversely, another important variable is the future costs of *not* implementing these projects; if not funded, there is the potential to negatively impact the long-term viability of both the Community and its neighbors. While these costs are more difficult to quantify, they are no less important to our analysis, and are therefore addressed qualitatively. These costs include:

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

Project Benefits

The types of benefits considered in the CBA include:

- **Risk Reduction.** The extent to which a project reduces the risk of damage to a community asset from a future storm event (discussed further below under “Risk Reduction Analysis”).⁵¹
- **Economic Resiliency.** The project’s potential to help minimize economic costs and reduce the time it takes for the local economy to rebound from a storm event. Economic 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.⁵²

LONG ISLAND SOUTH SHORE ESTUARY RESERVE COMPREHENSIVE MANAGEMENT PLAN (CMP)

Polluted stormwater runoff alone is the principal source of nonpoint pollution in 94% of the waterbody segments in the Estuary Reserve Area (which includes Greater Bay Shore). The CMP indicates that water quality is dependent on the:

- Design of projects that retrofit existing storm sewer systems to remove pollutants
- Adoption of best management practices
- Increase of outreach and education to modify resident behavior



- **Health, Social and Public Safety Services.** Qualitative information on the overall benefits of improved access to health and social service facilities and public safety services; type and size of socially vulnerable population secured;⁵³ 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 project.
- **Environmental Protection.** Benefits include: the protection of crucial environmental assets or high-priority habitat, and threatened and endangered species; migration or habitat connectivity; potential improvements to water quality; any clean-up resulting from the action; creation of open space or a new recreational asset.

Risk Reduction

A Risk Reduction Analysis estimates the extent to which Proposed and Featured Projects will reduce 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 reduced such risk is also considered as a benefit in the Cost Benefit Analysis; see “Project Benefits” above.) Risk “reduction” is different from the risk “assessment” in the previous section in a very important way—risk assessment looks at storm and flood risks to community assets *before* the project is implemented; risk reduction looks at the reduced risk *after* the project is in place.

For the risk reduction analysis, projects were evaluated under a 3-foot rise in sea level scenario for their potential to reduce an asset’s level of exposure and/or vulnerability to future storms. This helped communities and decision-makers understand the potential environmental, social and economic outcomes associated with implementing a project.

The following Project Profiles have been organized to include the “highlights” of the projects in the right column of the first page. This column provides the reader with an overview of the key characteristics of the project while the left hand column of the profiles provides a more detailed narrative of the Proposed or Featured Project.



PROPOSED PROJECT: **GREATER BAY SHORE RESILIENCY GENERATOR PROJECT**

Project Description

This Proposed Project would include the permanent placement of fixed generators at several crucial community facilities including:

- Bay Shore Fire Department Headquarters
- Brightwaters Village Hall
- YMCA
- Bay Shore High School
- Maple & Ocean Avenue Docks
- Town of Islip 2nd Avenue Highway Yard

Background

During and after periods of extreme weather the provision of a reliable and sufficient supply of electricity is critical to a community's ability to recover. During Superstorm Sandy as well as in its aftermath, Greater Bay Shore was severely impacted by the lack of electrical power. Aside from the loss of power to residents, businesses and other components of the community, locations that had the potential to serve as command and control centers as well as refuges for those in need were impacted by the loss of power.

The Bay Shore Fire Department (BSFD) Headquarters has limited on-site auxiliary generator capacity. In fact, during Superstorm Sandy, the firefighters learned that the generators did not power the electronic door locks, requiring them to use extraordinary means to access the building. The existing generator powers the garage doors and the communications systems as well as limited emergency lighting. The ability to fully utilize this structure to serve as a command and control center, to house first responders and provide for their 24 hour occupancy including heat, food and showers as well as to potentially provide support for others as a refuge (emergency utility workers used the facility during Superstorm Sandy in spite of its limited services) will make Greater Bay Shore a more resilient community.

Bay Shore High School currently has limited auxiliary generator capacity which allows it to maintain emergency lighting, and minimal climate control to maintain the pipes and HVAC infrastructure from freezing. The ability to continue to maintain

GREATER BAY SHORE RESILIENCY GENERATOR PROJECTS



Location

- Community-wide

Cost

- \$1,425,000

Needs

- Outreach and assistance to Community (including Vulnerable Populations) before, during, and after storm event
- Support for civic organizations to effectively respond to disaster relief
- Adequately equip first responders

Assets Made More Resilient

- Entire Community
- Community Facilities
- First Responder Facilities
- Schools
- Marinas and Ferry Terminals
- 2nd Avenue Highway Yard

Risk Reduction & Benefits

- Reduced flooding
- Creation of refuge areas
- Food service to vulnerable populations
- Improved first responder access in marina areas
- Uninterrupted fuel supply for first responders, and others
- Maintenance of access to ferry terminals during flood events
- Improved evacuation



Greater Bay Shore NY Rising Community Reconstruction Plan

lighting, showers, heat and prepare hot meals during severe weather events at this facility would result in a significant improvement to the community's resiliency.

The Bay Shore School System serves an amazingly diverse population. Nearly two-thirds of the students are classified by the Census Bureau as minority; 16% qualify as special needs students; 6% are enrolled in English as a Second language (ESL) programs; and nearly 40% live in households whose income is below the poverty line. The district participates in the Summer Food Service Program which provides breakfast and lunch to all children 18 years and younger without charge. This Proposed Project identifies the addition of two permanent, auxiliary generators at the Bay Shore High School. The inclusion of two generators was necessary due to the large physical plant of the High School, and the desire to ensure adequate power at a facility that has the ability to serve a large and wide-ranging segment of the Community during times of need. The ability for the High School to act as a community refuge, to continue to feed and serve children and others during and after severe weather events will significantly improve the community's resiliency.

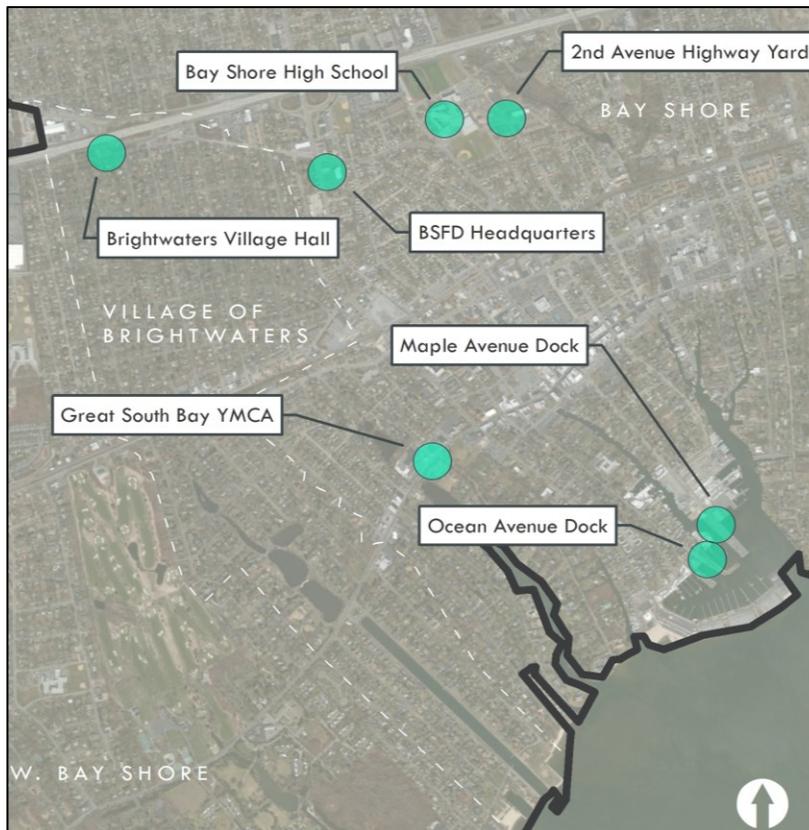


Figure 5. Proposed Permanent Generator Locations

Permanent generators are proposed to fortify the resiliency of several existing community facilities located throughout Greater Bay Shore.



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Additional generator capacity is also needed at the following locations:

- *Village of Brightwaters Village Hall* to allow for command and control operations during electrical outages associated with severe weather events. Currently, this facility has no permanent auxiliary generator.
- *Great South Bay (Bay Shore) YMCA* to allow for the continued operation of the facility and its ability to support the Greater Bay Shore community as a refuge including its substantial vulnerable populations. Although the YMCA was able to provide some level of service during Sandy, the facility currently has no auxiliary power capacity.
- *Town of Islip 2nd Avenue Highway Yard*: This Town of Islip facility is of regional importance as it provides fuel and other services to Town of Islip emergency service providers, and the BSFD as well as all of the life safety services on Fire Island. The facility is currently in need of a permanent fixed generator to maintain access to the fuel supply and supporting services.
- *Maple Avenue & Ocean Avenue Docks*: During Superstorm Sandy, electric service to the storm drainage pumps failed which contributed to flooding. The addition of generators to provide auxiliary power to storm drainage pump stations at these key waterfront locations would help to fortify the resiliency of these transportation terminals and evacuation routes. At present, these facilities have no permanent auxiliary generators in place.

Estimated Project Cost

The approximate conceptual costs for this project are estimated to be \$1,425,000, which includes \$1,020,000 for the purchase and installation of eight (8) commercial grade auxiliary generators (or comparable generators), \$250,000 in contingency costs and \$155,000 for design, permits and construction management (soft costs). The cost of the individual generators including contingency and soft costs is:

- Bay Shore Fire Department 250KW generator: \$234,000
- Bay Shore High School
 - 150 KW generator: \$210,000
 - 250KW generator: \$321,000
- YMCA 250KW generator: \$333,000
- Village of Brightwaters Town Hall 75KW generator: \$105,000



Sample 250 KW generator.
Source: KS Engineers, PC



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- 2nd Avenue Highway Yard 75KW generator: \$84,000
- Maple Avenue Dock 50KW generator: \$69,000
- Ocean Avenue Dock 50 KW generator: \$69,000

The estimated operations and maintenance costs associated with this package of improvements is approximately \$24,000 per year. Assuming an average useful life of 20 years for these improvements, a conceptual life cycle cost of \$1,905,000 has been estimated.

Project Benefits

Risk Reduction and Resiliency

The project would increase the resiliency of critical command and control and refuge facilities in Greater Bay Shore and allow them to operate at needed capacity if electricity fails during and after an emergency. The installation of permanent generators at the identified facilities would help to ensure continuous power during outages to support both storm preparation and recovery functions. This will lead to increased resiliency of the entire Community as recovery can advance at a faster pace with critical services uninterrupted.

As a result, the enhanced facilities could be used to provide access to basic necessities, including electricity, heat, air-conditioning, and communications capabilities, as well as other response resources. Depending on the season, the facilities could be used as warming or cooling centers and have the potential to prevent life-threatening situations, such as hypothermia and heat stroke, which can result from multi-day power outages in cold or hot weather. Access to hot showers, prepared food, and other support functions will serve the greater population who may not have access to their homes. Additionally, these facilities can be utilized to house emergency responders or utility crews who may have no other facilities available to them during these times. Access to well-equipped facilities/shelters may also reduce residents' stress and trauma during a major disaster situation. Furthermore, the provision of post-disaster recovery information at the location would provide residents with the knowledge to access funding and in-kind assistance for rebuilding.

Economic Benefits

The implementation of this project would generate approximately 18 Full-Time Equivalent (FTE) jobs.⁵⁴ Auxiliary generators will create economic benefits by initially reducing damage at the sites where



the generators are housed. Auxiliary power will allow for pumps to be maintained and for staff to remain on site to combat flooding and associated severe weather impacts. The auxiliary generators will allow first responders to maintain operations at full capacity during storm events. Maintaining access to fuel by first responders (at the Town of Islip Highway Department) will also benefit the residential and business communities. There will be avoided costs related to locating a portable generator, bringing it in, setting it up, and manning the generator.

Health and Social Benefits

Backup power is essential for the provision of key command and control, emergency response and the operation of potential refuge centers particularly during emergency events, when these services are most needed. The provision of generator capacity to the High School and the YMCA will also serve vulnerable populations who rely heavily of the services of these institutions.

Cost Benefit Analysis

Project cost: \$1,425,000

Life-cycle cost: \$1,905,000

Recurring costs: Though recurring costs are captured in the life-cycle cost, it should be noted that operations and maintenance costs will be the responsibility of the implementing entity or other project partner.

External costs: Generators will be located in areas most appropriate to serving electric needs, while not displacing other critical uses. Also, there could be issues related to noise/air quality, depending on adjoining uses; however, generators are presumably only used during short-term emergency situations and installation will be done in locations that minimize external effects.

Groups impacted: The project would benefit the entire Community. In addition to assisting those in need of rescue services, this project could also allow different buildings to be used as refuge for first responders, utility repair crews, and community members and others in need. Vulnerable populations and those requiring emergency services will see the greatest benefits. The High School and YMCA could likely temporarily house several hundred people on a short term basis.



Savings: Cost savings would come in the form of the maintenance of buildings, equipment, and services that otherwise would not operate in the absence of power. The continued maintenance of these items could result in savings related to reduced storm damage, quicker response, better coordinated command and control, and reduced physical injury to community members.

Opportunity cost: In a worst-case scenario, lack of electricity could shut down rescue operations as emergency workers may not be able to access equipment, and maintain communications. There may also be an opportunity cost associated with loss of the footprint where the generator is located.

Risk Reduction Analysis

This project was not advanced through the Risk Assessment Process, as it is difficult to quantitatively assess the level of Risk Reduction for this type of facility upgrade. However, in general, the entire Community will be more resilient because several local public facilities will be equipped with backup power and able to serve the Community during power outages/storm events. As a result, residents may be more comfortable evacuating their homes during emergency events, thereby decreasing the risk of injury to citizens and first responders alike.

General Timeframe for Implementation

It is estimated that, from the time implementation begins, this project has potential for immediate implementation (0 to 12 months).

Regulatory Requirements Related to Project

There are no anticipated regulatory requirements for implementation of this Proposed Project.

Jurisdiction

Bay Shore School District, Bay Shore Fire Department, Town of Islip, Village of Brightwaters, and the Great South Bay YMCA.



PROPOSED PROJECT: **COMMUNITY BASED ORGANIZATION (CBO) & VULNERABLE POPULATION EMERGENCY ACTION & EDUCATION PLAN**

Project Description

The Proposed Project is to develop an Emergency Action and Education Plan (EAEP) to address emergency, evacuation, and long-term resiliency needs of vulnerable populations and for those Community Based Organizations (CBOs) that provide services during and after severe weather events and emergency situations (e.g., Bay Shore Fire Department, rescue services, school district, YMCA, etc.). The plan would address an important need in the Community for an overall plan to coordinate the pre-storm and post-storm response and recovery for a large and varied vulnerable population. There is no such plan at present nor was such a plan in place when Superstorm Sandy impacted the Community in 2012. Those most vulnerable to the disruptions caused by severe storms include the elderly, infirm and individuals with disabilities, homeless, and families and individuals of low and moderate incomes, among others.

The CBO component of this project would examine how organizations can most effectively work together to help the Community in an emergency situation. Responsibilities of the various organizations would be identified to capitalize on their strengths, capacity, and resources. This would reduce opportunities for duplication of services and identify potential gaps that might exist. The plan would also identify needed resources such as equipment and supplies and would also formalize protocols, outline logistics and understand operational resources. Highlights of the proposed plan include:

- **Home Care Continuity Program:** During Superstorm Sandy, home health care professionals were operating in dangerous conditions similar to those of first responders. Fuel shortages hindered their ability to provide care for elderly patients or individuals with disabilities who rely on these caregivers for medical support and to also accomplish routine daily activities. Any emergency that interrupts this supportive care leaves this vulnerable population at risk. This program would ensure continuity of care by

COMMUNITY BASED ORGANIZATION & VULNERABLE POPULATION EMERGENCY ACTION & EDUCATION PLAN



Location

- Community-wide

Cost

- \$475,000

Needs

- Support for community organizations to effectively respond to disaster relief
- Improved assistance and outreach to special needs population before, during, and after emergency events

Assets Made More Resilient

- Community facilities and organizations
- All residences (including those occupied by Vulnerable Populations) and businesses of Greater Bay Shore

Risk Reduction & Benefits

- Improved emergency preparedness and response capabilities
- Reduction in duplication of services
- Improved and coordinated local emergency protocols
- Lowered risk of long-term mental and physical ailments as a result of acute weather events



Greater Bay Shore NY Rising Community Reconstruction Plan

- providing home health care professionals (e.g., visiting nurses services, aides, therapists) with access to fuel and emergency information from municipal officials.
- **Community Education & Awareness Campaign:** A coordinated public outreach program would inform the Community about appropriate meeting points, where to go to seek services or shelter before, during, and after a storm event. This campaign could use mailers, flyers, robocalls, listserves, school assemblies, and capitalize on existing programs like National Fire Safety Month.
 - **Central Refuge/Shelter Plan:** The need for another centrally-located refuge in the Community would be evaluated and requirements for such a facility would be identified.
 - **Greater Bay Shore CBO Forum:** Development of a formalized collaborative structure that continues to meet after the NYRCR Committee has completed its task would ensure the ongoing discussion around the issue of Community preparedness and resiliency.

Background

Greater Bay Shore has a long history of civic action and community pride – we take care of our own. As a result, there is an active concentration of Community Based Organizations (see Section V, Table 35). Greater Bay Shore contains a cross section of vulnerable populations and almost 15% of the Community is 65 years of age or older. This elderly population includes residents of low-moderate income housing, as well as individuals with disabilities. A total of 340 dwelling units exist in the following subsidized developments: Penataquit Village, South Wind Village, Bay Town Village, Hemlock Green and Tudor Village.⁵⁵

There are also many unsubsidized apartments and single family dwelling units that also house residents that are vulnerable based on physical and economic conditions. One such location is near the waterfront in Bay Shore in the vicinity of South Clinton Avenue, Auburn Avenue and Burnett Avenue. This is a neighborhood of moderate and small houses and apartments that were historically occupied by families that made their living from the bay. As a low-elevation neighborhood, many of the residents may be particularly vulnerable to the effects of storms including damage from flooding (from both stormwater and tidal surges), wind, fallen trees and



Greater Bay Shore possesses a large number of active civic associations.

Source: Jacobs



The YMCA Boulton Center for the Performing Arts is a regional destination on W. Main Street (Montauk Highway).

Source: Jacobs



Greater Bay Shore NY Rising Community Reconstruction Plan

power and communication interruptions. Also, as a Low-Moderate Income neighborhood, limited personal financial resources can prolong the recovery time for residents to get back to pre-storm conditions.⁵⁶ In addition, the Bay Shore Census Designated Place (CDP) has a poverty rate of 7.1% as reported by the American Community Survey (2008-2012 5-year estimates). Additionally, according to American Community Survey data, a significant portion of the population in Greater Bay Shore has no health insurance coverage (Bay Shore: 15.3%; Brightwaters: 6.2%; West Bay Shore: 3.1%).

Another part of the population that is vulnerable are the patients of LIJ Southside Hospital, a tertiary level health facility with 341 beds and related services including an emergency care department. The patients of the hospital — both in-patient and emergency — are highly vulnerable to the impacts of severe storms such as flooding and impaired road access. Similarly, the Atria Assisted Living facility along Watchogue Creek is also subject to the effects of severe storm events with a vulnerable elderly population. In addition, the Community contained 1,486 households in 2012 that received benefits under the U.S. Department of Agriculture (USDA) Supplemental Nutrition Assistance Program (SNAP), over 8% of the total households.⁵⁷

The community-based organizations of Greater Bay Shore provided vital services before, during and after Superstorm Sandy. Many of the organizations are staffed by resident volunteers that gave their time, talent, and local knowledge to the response and recovery effort. Their actions were instrumental in ensuring the safety and well-being of those in need. The services included rescue and evacuation assistance, emergency medical care, temporary shelter, provision of supplies including food, water, clothing, blankets; and social, spiritual and mental health assistance.

The Committee lauded the work of the CBOs but noted that there were problems that occurred during Superstorm Sandy (pre-storm and post-storm) that should be corrected prior to future storms. These included communication problems among the CBOs as well as with the larger Community. It also included problems of coordination when one group did not know what the other groups were doing and where they could help each other. For example, there was no central coordination of supplies so one group might need clothing while another group had more than they could handle. In addition, it was not known which community



Mural at the Great South Bay YMCA.
Source: Jacobs



One of many Houses of Worship in Greater Bay Shore.
Source: Jacobs



organizations were providing on-site services for residents, such as meals, showers and lodging. None of this was coordinated thus resources were not used to their best advantage.

Estimated Project Cost

The approximate conceptual costs for this project are estimated to be \$475,000. This total includes \$306,250 for the development and implementation of the EAEP, \$50,000 for the continued management and ongoing implementation of this plan, and \$118,750 in contingencies. The operating and maintenance costs associated with this plan are the equivalent of the \$50,000 allotment set aside for the Greater Bay Shore CBO Forum to oversee management and implementation.

Project Benefits

Risk Reduction and Resiliency

An Emergency Action and Education Plan would provide the area's numerous CBOs with an opportunity to initiate planning and coordination among the organizations who are most active within the Community.

As an example, one potential component of this project, the Greater Bay Shore CBO Forum could be encouraging Town and Village participation in the National Flood Insurance Program (NFIP) Community Rating System (CRS). Participation in the Community Rating System involves completing a variety of floodplain management activities that exceed the NFIP's minimum requirements. In turn, property owners may receive discounts on flood insurance premiums that reflect their reduced flood risk.

The Proposed Project would also reduce the risk of unmet health care needs for the vulnerable populations within the Community. For example, in terms of outreach, prior to an event the CBOs could coordinate on reminding residents about refilling prescription medications and charging batteries in medical devices. In the immediate aftermath of a severe storm event, the health care issues in need of explanation may relate to acute trauma or hypothermia.

This Proposed Project would help to ensure that residents are prepared for, and equipped to, respond more effectively to disaster-related health issues.



Economic Benefits

The development of an EAEP to coordinate the efforts of the CBOs to effectuate emergency response and a community preparedness education program would reduce the time it takes to recover from a storm and reduce the economic impact to the Community. For example, elderly residents displaced due to damaged homes or lack of heat and power may not be able to support the retail stores and services that sustain local economies. Home Care professionals unable to get to their clients due to lack of fuel may not get paid, let alone provide vital care to some of the Community's most vulnerable residents.

The project would create jobs associated with the preparation of the plan. This is estimated at approximately 6 FTE temporary jobs.⁵⁸ There are no operations and maintenance costs associated with the preparation of the plan.

Health and Social Service Benefits

The implementation of the recommendations contained in the EAEP would specifically benefit vulnerable populations relative to their preparation for, response to, and recovery from severe weather events.

This project would also improve coordination amongst civic entities within the Community. As a result, the Community as well as these institutions (BSFD, YMCA, School District, etc.) would be better prepared in the lead up and aftermath of a storm event or emergency situation. Accrued benefits resulting from this project include more efficient use of organizational resources, reduced duplication between organizations. The improved coordination and organization by these groups will supplement public efforts, allowing municipal efforts to be more efficient and reach more people. Additionally, Greater Bay Shore residents, including vulnerable populations, would be more aware of what to do in a weather-related event and its immediate aftermath.

Cost Benefit Analysis

Project cost: \$475,000

Life-cycle cost: \$525,000

Recurring costs: Though recurring costs are captured in the life-cycle cost, it should be noted that operations and maintenance costs will



Greater Bay Shore NY Rising Community Reconstruction Plan

be the responsibility of the implementing entity or other project partner.

Groups impacted: CBOs, residents and businesses served by CBOs, and vulnerable populations would benefit directly from this project. Vulnerable populations include the elderly, infirm and individuals with disabilities, homeless, and families and individuals of low and moderate incomes. Almost 15% of the Community is 65 years of age or older. Low-moderate income housing includes a total of 340 dwelling units in subsidized developments (Penataquit Village, South Wind Village, Bay Town Village, Hemlock Green and Tudor Village). Other vulnerable groups include those living below the poverty line, (the Bay Shore Census Designated Place (CDP) has a poverty rate of 7.1%), those without health insurance (Bay Shore: 15.3%, Brightwaters: 6.2%, West Bay Shore: 3.1%) and the 1,486 households in 2012 that received benefits under the U.S.D.A. Supplemental Nutrition Assistance Program (over 8% of the total households).

This project would also benefit healthcare professionals and home health care workers, and volunteers, allowing them to continue working in safety.

Savings: There will likely be less spending needed on emergency operations when there is an established plan, education, and outreach before a disaster hits. Improved coordination between these multiple organizations could also reduce redundancies and costs associated with the provision of redundant services.

Opportunity cost: Without this project, the approximately 4,500 Community residents without health insurance and 4,400 elderly residents may not have access to the services they need in another emergency event. Additionally, residents who are displaced due to damaged homes or lack of heat and power may be unable to support the retail stores and services that sustain local economies. Home Care professionals who cannot get to their jobs may lose wages and may not be able to provide vital care to the Community's vulnerable residents.

Risk Reduction Analysis

This project was not advanced through the Risk Assessment Process, as it is difficult to quantitatively assess the level of Risk Reduction for these types of community-based actions. Yet the project would increase resiliency throughout the Community as all



Greater Bay Shore NY Rising Community Reconstruction Plan

residents, business owners, and first responders in the area will be more informed and better prepared to deal with major storm events.

General Timeframe for Implementation

From the time that implementation begins, it is estimated that the project could be completed in the short-term (12-18 months).

Regulatory Requirements Related to Project

The preparation of an Emergency Action and Education Plan for Community Based Organizations does not require any specific regulatory approvals. It would require the cooperation of the involved entities to work together in a common goal. It may be appropriate for each of the participating entities to obtain the support of their governing bodies to join the effort so that there is recognized “buy in” to the process. It may also be appropriate for the governing bodies to endorse the plan once completed to provide formal approval of the plan.

Jurisdiction

There is no single entity with jurisdiction. As a cooperative effort among many entities, the involved organizations would voluntarily participate in the effort.



PROPOSED PROJECT: **PHASE I: BRIGHTWATERS CANAL RESILIENCY IMPROVEMENTS**

Project Description

This Proposed Project (Phase I) would involve the replacement of deteriorated and/or damaged bulkheading along the northern portions of the Canal. This resiliency project would provide for increased height where appropriate, to match the height of bulkheading closer to the Bay. Phase I of this improvement has been proposed for a 500-foot length of bulkheading. This project could help to ease flooding on Montauk Highway and also benefit the Southwest Sewer District pump station near Walker Park.

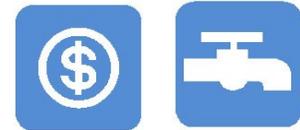
This project is the first of three phases (500-linear feet per phase) related to the replacement of bulkheading along the Canal. Phases II and III are included as a Featured Project.

Background

The Brightwaters Canal stretches approximately 3,700 feet from the Great South Bay to its terminus adjoining Montauk Highway. The 160-foot wide canal has moorings for more than 200 boats along its length and provides access to the Bay for large and small boats alike. Unlike many of the smaller canals on the South Shore of Suffolk County, this canal contains a sufficient draft for boats to come and go regardless of the tide. The moorings along the canal are owned by the Village of Brightwaters and the ability to continue to collect mooring fees is crucial to the Village's economic resiliency.

Superstorm Sandy battered the canal and the two adjoining roadways - Concourse East and West. Sections of bulkheading have been severely weakened and undermined as seawater from the canal has infiltrated the damaged bulkheads and created cave-ins in the adjoining land areas. The tidal surge from Superstorm Sandy damaged bulkhead systems allowing unimpeded flooding of adjacent neighborhoods and erosion of land behind the structure. The existing public bulkheads are cracked, not sealed properly to the outfall pipe, and have separation between the bulkhead and the adjacent land. In spite of many years of appropriate maintenance and upgrades, the damage from Superstorm Sandy continues to reveal itself with each passing storm. The ability to replace the most damaged sections of bulkheading and increase the height of the bulkheading by 18 inches, as permitted by the New York State

PHASE I: BRIGHTWATERS CANAL RESILIENCY IMPROVEMENTS



Location

- Brightwaters Canal adjacent to Concourse East & West (Village of Brightwaters)

Cost

- \$677,000 (Phase I)

Needs

- Minimize local flooding on roadways
- Improved ability to circulate in waterfront area
- Improved resiliency of adjacent housing and waterfront economy

Assets Made More Resilient

- Residential housing along Concourse East & West
- Montauk Highway
- Sanitary Pump Station
- Moorings in Brightwaters Canal

Risk Reduction & Benefits

- Decreased vulnerability to flooding
- Improved ingress and egress from homes during flood events
- Improved access to adjoining roadways and Montauk Highway
- Continued income to Village from mooring rentals



Greater Bay Shore NY Rising Community Reconstruction Plan

Department of Environmental Conservation (NYS DEC), will help to attenuate wave action in the Canal, and help reduce flooding to property along Concourse East and West as well as the adjoining section of Montauk Highway. This Proposed Project will also continue to allow the Village of Brightwaters to collect mooring fees for the berthing of boats along the Canal's bulkheads.

This project will require an engineering design component which will include an inventory of the condition of the Village-owned bulkheads along the Canal, identification of locations most in need of rehabilitation, and appropriate designs to repair or replace those bulkheads. Decisions on which bulkheads will receive repairs or replacement will be based on the locations most in need of improvement and the availability of funding. This project proposes the replacement and/or upgrading of up to 500 feet of bulkhead. The improvement is proposed to occur in three (3) 500-linear foot phases.

Estimated Project Cost

The approximate conceptual cost for this project (Phase I) is estimated to be \$677,000. This total includes \$67,700 for design, permitting and construction management, and \$169,300 in contingencies. The estimated operations and maintenance costs associated with this project is \$5,000 per year. Assuming an average useful life of 30 years for these improvements, this project has a conceptual life cycle cost of \$827,000.

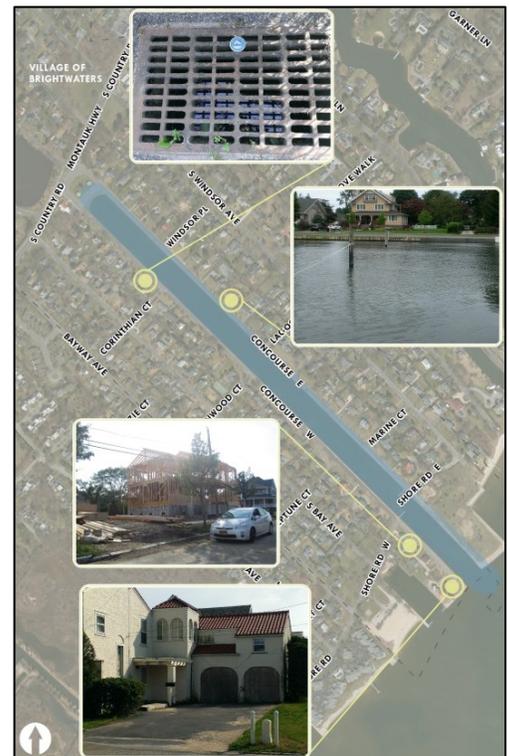
Project Benefits

Risk Reduction and Resiliency

Improving the public bulkhead system along the Brightwaters Canal will increase the resiliency of the adjoining residential neighborhoods and roads south of Montauk Highway. This project reduces the risk for assets in these areas by improving shore defenses, thereby reducing exposure to flooding and flood-related impacts. The bulkheads themselves will be made more resilient; therefore, they will be at less risk for damage from future storms. Montauk Highway, which is immediately north of the Canal, is a major regional roadway that serves as the primary east-west connector along Suffolk's South Shore. This road provides access to local residential streets, businesses as well as two nearby medical facilities: LIJ Southside Hospital and Good Samaritan Hospital. The implementation of this Proposed Project will limit flooding from the overtopping of the Canal on the roadway and increase its resiliency.



Undermined bulkhead, Brightwaters Canal
Source: Jacobs



Areas along the Brightwaters Canal suffer from recurring flooding and poor drainage, especially since Superstorm Sandy.



Greater Bay Shore NY Rising Community Reconstruction Plan

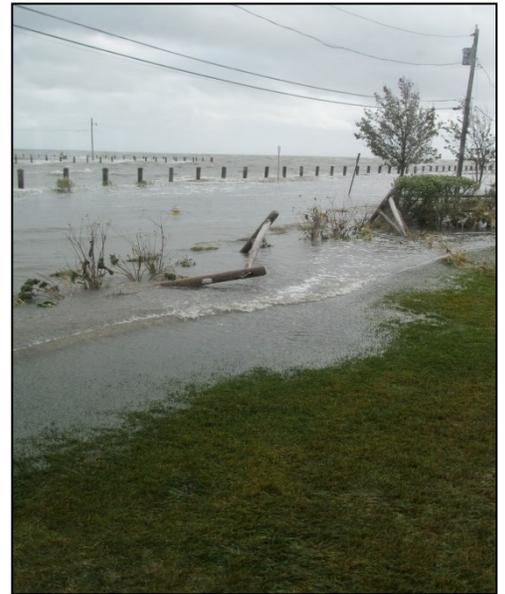
About 60 existing homes line Concourse East and West streets which directly front the Canal. These 60 homes would be made more resilient through a decreased risk of flooding and/or damage due to wave action. Emergency access to these residences during flood events would also be improved. Finally, a Suffolk County Southwest Sewer District pump station is located on Shore Road adjoining the Canal. Improvements to the bulkheads in the adjoining area would make this facility more resilient.

In all likelihood, this Proposed Project would not completely stop flooding in the event of another major natural disaster or storm event similar to Superstorm Sandy. However, this project would help to decrease the vulnerability and exposure of the residential homes proximate to the Brightwaters Canal due to improvements in the physical resiliency of the waterway.

Economic Benefits

The implementation of this project could potentially create temporary jobs for a minimum of one year. An estimated 8.5 Full Time Equivalent (FTE) jobs would be created during that period.⁵⁹

Permanent Village jobs associated with the maintenance of the Canal and its bulkhead that existed prior to and after Superstorm Sandy will be retained with these improvements. The Brightwaters Canal Resiliency Improvements will address the Long Island REDC goal: Investments in Rebuilding LI “Smartly” from The Strategic Economic Development Plan for Nassau and Suffolk Counties (2013 Update) which includes this strategy: “Rebuild and expand infrastructure to improve job access, revitalize downtowns and transit hubs, speed trade, and attract and retain dynamic regional businesses and highly skilled workers.” The Canal Resiliency Improvements project will enhance the local economy by preserving real estate values. Rehabilitating the bulkhead systems will diminish negative impacts on property value that might result from frequent flooding. The Waterfront Resiliency Improvements will reduce future storm-related emergency and recovery costs by reducing the frequency and location of flooding. These improvements will reduce the costs of personal property damage for homeowners from flooding events. These improvements could also reduce damage to private vehicles in driveways along the Canal as a result of flooding. Restoration of the bulkhead system will allow the Village of Brightwaters to continue to lease the entire allotment of moorings to boat owners, providing a key component of the Village’s operating revenue.



Water level of Brightwaters Canal and resultant flooding on Concourse West the day after Superstorm Sandy.

Source: Greater Bay Shore NYRCR Planning Committee



Health and Social Benefits

This Waterfront Resiliency Improvement Project will decrease the severity of roadway flooding therefore maintaining transportation access to health and medical facilities for affected residents. The elimination of ponding, which can breed mosquitoes, is a positive health benefit from reducing flooding. Decreasing and/or eliminating flooding will improve the overall quality of life in the Community which will be a positive social benefit

Cost Benefit Analysis

Project cost: \$677,000

Life-cycle cost: \$827,000

Recurring costs: Though recurring costs are captured in the life-cycle cost, it should be noted that operations and maintenance costs will be the responsibility of the implementing entity or other project partner.

External costs: Construction and repair of bulkheads could inconvenience businesses and local residents. There will be potential wage and revenue losses during construction to the Village due to the temporary displacement of moorings along the canal wall.

Groups impacted: Residential neighborhoods and roads south of Montauk Highway will be less exposed to floodwater. There will be decreased risk to 60 homes along Concourse East and West, the Southwest Sewer District pump station, and the adjoining section of Montauk Highway, which provides access to local residential streets, businesses, LIJ Southside Hospital, and Good Samaritan Hospital. This project would mainly impact the Village of Brightwaters, and neighborhoods and roads that are adjacent to the canal. Risk would be reduced for assets in extreme and high hazard areas.

Savings: To the extent that erosion and damage to bulkheads worsens, it is beneficial to address problems as early as possible when they will likely cost less to address. Additionally, with reduced flooding, there will be reduced emergency and recovery costs.

Opportunity cost: Without this project, erosion and damage to bulkheads will continue. There will be missed opportunity to preserve real estate values and to reduce damage to vehicles.



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Flooding of Montauk Highway and adjacent streets would hinder the provision of services and emergency access. Also, Brightwaters could lose moorings that it leases, which is a key component of its operating revenue.

Risk Reduction Analysis

Well-designed, raised bulkheading would help to improve the physical and economic resiliency of the Community. This project will increase the resiliency of neighborhoods and roadways that are adjacent to the Canal, especially Concourse East and West. The project reduces risk for assets in the Severe and High classifications, especially those located south of Main Street/Montauk Highway by reducing exposure to flooding and flood-related impacts.

General Timeframe for Implementation

It is estimated that, from the time implementation begins, this Proposed Project has potential for mid-term implementation (12 to 18 months). An engineering evaluation will identify locations in need of improvement and to develop plans for improvement (3 months). Engineering plans will be submitted to regulatory agencies for review and permit approval (6 months). Upon receiving regulatory and permit approvals, bid documents will be prepared and contractor(s) to conduct the work will be selected (3 months). The project will be constructed per the contractor schedule submitting during the bidding process; construction is anticipated to take between 3 to 6 months, depending on the project design, time of year, weather, or other variable factors.

Regulatory Requirements Related to Project

Potential challenges are moderate in scope. This project would likely require close coordination between the Village of Brightwaters, the New York State Department of Environmental Conservation (NYS DEC), New York State Department of State (NYS DOS) and possibly the U.S. Army Corps of Engineers (USACE).

Tidal Wetlands, Protection of Waters and Water Quality Certification approval would be needed from the NYS DEC for bulkhead reconstruction and/or modification.

A NYS DOS Coastal Zone Management (CZM) consistency review could be required in areas of the Village that lie within the State's Coastal Zone boundary. Additionally, review and coordination as



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well as the necessary extensive environmental permitting would be required with NYS DEC.

Jurisdiction

Village of Brightwaters.



PROPOSED PROJECT: **STREAM CORRIDOR & LAKES DRAINAGE CAPACITY IMPROVEMENT INITIATIVE**

Project Description

This Proposed Project would complement the Town of Islip's *Great Cove Watershed Management Plan (GCWMP)*. Whereas the GCWMP primarily focused on best management practices and conceptual projects to improve water quality, this initiative is intended to address stormwater capacity and management.

This project is a comprehensive drainage analysis, development of design, and long-term management recommendations for six north-south natural stream/creek corridors that traverse Greater Bay Shore and the series of artificial lakes that stretch from Montauk Highway to Lawrence Drive in the Village of Brightwaters. These waterfeatures include:

- Trues Creek
- Lawrence Creek
- Watchogue Creek
- Penataquit Creek
- Awixa Creek
- Orowoc Creek
- Brightwaters Artificial Lakes
 - Cascades Lake
 - Mirror Lake
 - Foehr Lake
 - Nosreka Lake

This Proposed Project would include an engineering analysis to identify the specific drainage areas associated with each creek or lake, the potential volumes of water that could be expected during severe events (100-year and 500-year storm) and the capacity of the creeks to convey that water. Based on this analysis, the project would identify specific actions that could be undertaken to improve these waterfeatures' ability to convey and store storm water while also improving water quality and wildlife habitat.

These actions could include: restoration of the stream/creek bed through the removal of silt and debris; expansion of the floodway through property purchase or the addition of

STREAM CORRIDOR & LAKES DRAINAGE CAPACITY IMPROVEMENT INITIATIVE



Location

- Trues Creek
- Lawrence Creek
- Watchogue Creek
- Penataquit Creek
- Awixa Creek
- Orowoc Creek
- Brightwaters Artificial Lakes

Cost

- \$1,917,000

Needs

- Protect natural systems to improve flood protection, stormwater retention, and water quality
- Improved resiliency of adjacent housing

Assets Made More Resilient

- Residences
- Businesses
- Community Facilities
- LIJ Southside Hospital
- Montauk Highway
- Residential housing in the vicinity of Brightwaters Lakes (over 50 residences)

Risk Reduction & Benefits

- Decreased vulnerability to flooding
- Reduced storm-related expenditures for local businesses, residences, and institutions
- Reduced personal property damage
- Improved emergency access



enlarged storm water retention areas; daylighting of the waterfeature where it has been covered and channelized; replacement and enlargement of damaged culverts; the addition of resilient native plantings within the riparian zone, other improvements that would restore the creek's natural functions and long-term sustainability as well as the evaluation of the condition of the structures associated with the lakes (culverts, pipes, walls, dams, sluice gates) and the assessment of the need for repair and replacement.



Figure 6. Water Resources in Greater Bay Shore
Stream corridors, wetlands, and the Brightwaters Canal are located within the Greater Bay Shore Planning Area.

Background

In addition to the Greater Bay Shore Planning Area's more than 20,000 linear feet of bay front, a second water resource plays a major role in defining this Community. Six streams, traveling from as



far north as the Sunrise Highway, snake their way through the Community in various states of natural and man-made conditions and empty into the following creeks. Trues Creek, Lawrence Creek, Watchogue Creek, Penataquit Creek, Awixa Creek, and Orowoc Creek. These creeks act as a storm drainage way, a refuge for wildlife and as some of the few remaining unbuilt areas of the Community.

Historically, these creeks drained upland areas into the Great South Bay. Over time, the floodplains of these creeks, became developed with impermeable surfaces that dramatically increased runoff, reduced infiltration, and compromised the ability of the creeks to effectively serve their drainage function.

During Superstorm Sandy, these creeks reversed their normal north-south flow as a result of the Bay's severe inundation. They have become heavily silted, clogged with debris and overgrown. Culverts that connect portions of the creeks beneath streets and other developed areas have been damaged. These creeks no longer effectively serve their function of conveyance and storage of stormwater. Since Superstorm Sandy, these creeks have overrun their banks, flooded streets, homes and businesses and continue to degrade in terms of their storm water drainage function.

During Superstorm Sandy, the artificial lakes in the Village of Brightwaters flooded adjoining roadways and properties as well as Montauk Highway, the major east-west connector road on the South Shore of Long Island. Adjoining storm sewers that drain into the lakes also experienced back-ups. Roadway access to homes and to other traffic was compromised as a result of this flooding. The basements of nearby residences were flooded.

Estimated Project Cost

The approximate conceptual costs for this project are estimated to be \$1,917,000. This total includes \$1,721,000 for the development of the Stream Corridors & Lakes Drainage Capacity Improvement Initiative (design) and \$196,000 in contingencies. Since this is a design project there are no operating and maintenance costs or life cycle costs.

Estimated design costs for specific stream corridors are as follows:

- Trues Creek: \$173,500
- Lawrence Creek: \$18,000



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- Watchogue Creek: \$114,900
- Penataquit Creek: \$478,500
- Awixa Creek: \$508,100
- Orowoc Creek: \$268,000
- Brightwaters Artificial Lakes: \$160,000

Project Benefits

Risk Reduction and Resiliency

Stream Corridors

This Proposed Project is an engineering study that would recommend specific storm water management improvements and strategies related to the six stream corridors within the Greater Bay Shore Planning Area. Although the study does not include capital funding for the construction of these improvements, this project would provide multiple Risk Reduction benefits including better stormwater management and enhanced health of the natural environment should these recommendations be implemented in the future. Residences, businesses and community facilities such as LIJ Southside Hospital, located adjacent to these creeks are situated in high-risk areas and experienced flooding as a result of Superstorm Sandy. Enhanced natural stormwater conveyance and storage capacity of these creeks could reduce the risk to adjacent assets by reducing the exposure of those assets to flooding and flood related damage. One of the main benefits of the project would be the increased ability of the creeks to store storm surge water. The streams would function more naturally with the ability to channel stormwater runoff from upstream areas during rain events and accept the Bay's waters during tidal surge events. In addition, improving the health and flow of local stream corridors has the potential to improve the health of local wetlands. This project would also provide ancillary benefits to emergency providers and residents through the alleviation of flooding along crucial stretches of Montauk Highway. While the project would not eliminate all flood risks, it would reduce risk, especially during moderate level storm events.

Artificial Lakes

This project would result in a comprehensive engineering study that recommends improvements and best management practices for controlling storm water in this section of the Village of Brightwaters; with a focus on reducing risk and increasing resiliency. Best management practices could reduce local flooding on adjoining roadways such as Lakeview Avenues West and East as well as intersecting roadways. Access along these roads and across the two



connecting bridges on Johnson Drive and Lakeview Avenue North could be maintained during times of flooding. This would allow the residents in the approximately 53 homes that adjoin the lakes as well as critical emergency services to maintain access during severe weather events. The ability to regulate the water levels in the four lakes in a controlled and sustained manner could alleviate flooding across Montauk Highway which carries an Annual Average Daily Traffic (AADT) volume of more than 14,000 vehicles (increasing to over 16,500 vehicles per day in the summer).⁶⁰ Montauk Highway also provides access to two major regional hospitals as well as to downtown Bay Shore. The implementation of physical improvements and best management practices would allow for storage and transport of storm water in a manner that improves water quality in the Great South Bay through the settlement of particulate matter and filtration of stormwater along the adjoining riparian zone.

Economic Benefits

Stream Corridors

This Proposed Project is an engineering study and as such does not immediately entail any capital expenditures. The storm drainage recommendations made by this study would reduce storm-related emergency and recovery expenditures for local businesses and residences (i.e., personal property damages) in the vicinity of the streams and creeks. These improvements would benefit LIJ Southside Hospital given its location adjacent to the Penataquit Creek. The Hospital has experienced significant flooding during and after Superstorm Sandy. A recent flood event (since Superstorm Sandy) required more than \$3 million in repairs as a result of flooding from the creek.

Benefits would also include a reduction in days lost at work due to storm damage. Additionally, implementation of these recommendations could address potential negative impacts on property values by making adjacent neighborhoods more resilient to future storms which would have a positive impact on home values.

Artificial Lakes

This project proposes an engineering study and as such does not contemplate any capital expenditure. Nor would it create any FTEs. Implementation of the recommendations resulting from this study would result in an overall improvement in the ability of the Village to manage and control storm water in the vicinity of the



Figure 7. Village of Brightwaters Artificial Lakes

The area fronting the artificial lake system in Brightwaters is largely residential and is close to Montauk Highway, a crucial east-west access corridor.



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Brightwaters Canal. This benefit would result in reduced flooding to private property and local roadways. As a result, this improvement could eventually result in higher property values and increased tax ratables.

Implementation of recommendations from the study would also result in decreased flooding along Montauk Highway, a major regional roadway. This improvement would potentially diminish travel delays, maintain access to commercial businesses, and deliveries, and also allow first responders to maintain emergency access during flood events.

This project would be consistent with two Long Island Regional Economic Development Council (LIREDC) goals. *Investments in Rebuilding LI “Smartly”* includes the strategy to “Rebuild and expand infrastructure to improve job access, revitalize downtowns and transit hubs, speed trade, and attract and retain dynamic regional businesses and highly skilled workers.” Additionally, the project is also consistent with the LIREDC’s key strategy, *Investments in Our Natural Assets*, which is related to promoting improved infrastructure such as wastewater treatment, storm water runoff mitigation with positive impacts on aquaculture, quality of life and tourism.⁶¹

Environmental Benefits

The eventual restoration of these stream corridors and the introduction of Best Management Practices (BMPs) for the artificial lakes, the enhancement of their ability to transport and detain storm water and the restoration of healthy and sustainable plant communities are critical to Greater Bay Shore’s resilient future. Project benefits would include local flood control while potentially improving water quality as well as providing habitat for wildlife and improved recreational space for the public. The potential water quality improvements would be consistent with the recommendations of the Long Island South Shore Estuary Reserve Comprehensive Management Plan.⁶²

Health and Social Benefits

This project would potentially help to alleviate flooding along portions of Montauk Highway especially in the immediate vicinity of the LIJ Southside Hospital. This would help to provide unimpeded access to the Hospital as well as accessibility to this and other areas within the community by the fire department, police, emergency



medical services and utility repair crews who have been previously hampered by flooding. Creek drainage improvements, especially along the Awixa Creek could also help alleviate flooding on the LIJ Southside Hospital property itself allowing the Hospital to provide uninterrupted service to the community.

Cost Benefit Analysis

Project cost: \$1,917,000

Life-cycle cost: \$1,917,000

Recurring costs: Though recurring costs are captured in the life-cycle costs, it should be noted that operations and maintenance costs will be the responsibility of the implementing entity or other project partner.

External costs: While there are no external costs related to a study or design activities, the eventual implementation of the recommendations of this study could result in the short term inconvenience of nearby residents and businesses. These externalities could include activities related to construction in and around the waterways themselves and additional traffic related to construction on local roadways.

Groups impacted: Should the recommendations of this initiative be implemented, residences, businesses, and community facilities (such as LIJ Southside Hospital) that are close to the stream would benefit. These improvements would benefit LIJ Southside Hospital (which has experienced significant flooding during and after Superstorm Sandy), given its location adjacent to the Penataquit Creek. In 2012, 122 businesses were identified within 200 feet of these streams. These businesses would experience reduced flooding from this project.

Particular resources adjacent to streams are as follows:

- *Trues Creek*
 - Gardiner County Park, South Country School
- *Lawrence Creek*
 - St. Luke's Church, Sagtikos Manor
- *Watchogue Creek*
 - South Bay Marina, Storm Sewer Pump Station (Ocean Avenue Dock), Bay Shore Ferry Terminal, Storm Sewer Pump Station (Maple Avenue Dock), Maple Avenue Marina, Maple Avenue Dock, Ocean Avenue



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Dock, Gibson-Mack Holt House, Dr. George S. King Park, Community Reflection Garden, Shore Drugs, Bay Shore Marina (Town of Islip), Atria Bay Shore Senior Living, Montauk Highway/Main Street

- *Penataquit Creek*
 - Southside Mall, Brook Avenue Elementary School, Bay Shore Fire Station 2, Bay Shore-Brightwaters Rescue Ambulance, LIJ Southside Hospital, New York SMSA Cell Tower, South Shore Professional Plaza, Bay Shore Animal Hospital, Watchogue Creek Park, Homan Avenue Dock, Old Mill Pond, South Bay Marina, Storm Sewer Pump Station (Ocean Avenue Dock), Bay Shore Ferry Terminal, Storm Sewer Pump Station (Maple Avenue Dock), Maple Avenue Marina, Maple Avenue Dock, Ocean Avenue Dock
- *Awixa Creek*
 - LIJ Southside Outpatient Cancer/Oncology Center, Suffolk County DPW Sewage Pumping Facility, Montfort Seminary
- *Orowoc Creek*
 - LIJ Southside Outpatient Cancer/Oncology Center, Suffolk County DPW Sewage Pumping Facility, Montfort Seminary

In relation to the artificial lakes in Brightwaters, implementation of this project would potentially reduce flooding on Lakeview Avenues West and East, and intersecting roadways. There would be significant risk reduction to residential areas, parks, and open space. Flooding would be reduced across Montauk Highway, which provides access to two major regional hospitals, as well as to downtown Bay Shore. In particular, implementation of this project would benefit residents in the approximately 53 homes adjoining the lakes, and is expected to reduce the vulnerability of residential areas within the extreme- and high-risk areas of the Village of Brightwaters. There are no businesses in Brightwaters' high-risk flood zone, but there are six businesses in the extreme-risk zone.

Savings: To the extent that damage is getting worse, acting sooner rather than later would minimize costs. There would also be savings



due to avoided repeated property damage that would otherwise occur.

Opportunity cost: These streams and lakes no longer function effectively, and continually flood streets, homes and businesses. Without this project, the streams will continue to degrade in terms of their storm water drainage function. If the streams were able to function properly, this could reduce work days lost and address potential negative impacts on property values. In a worst-case scenario, access to major hospitals would continue to be compromised.

An additional opportunity cost would be accrued should residents or businesses choose to relocate from areas in proximity to creek and stream corridors.

Risk Reduction Analysis

This Proposed Project would improve the health of the local network of streams by restoring the natural movement of water. A functioning stream network is crucial to maintaining the health of the Great Cove Watershed. The potential stream improvement projects would also reduce flood risk to:

- Residences;
- Commercial properties;
- Community facilities; and
- Public areas adjacent to streams.

Additionally, enhanced flooding protection from this project is expected to reduce the vulnerability of residential areas within extreme and high risk areas of the Village of Brightwaters. Additionally, this project is anticipated to improve the health and reduce vulnerability of the Brightwaters Lakes themselves

General Timeframe for Implementation

It is estimated that, from the time implementation begins, this project has potential for mid-term implementation (12 to 18 months). This assumes approximately 3 months for the bidding and selection of an engineering consultant and approximately 12 to 15 months for the execution of the study and the development of the final recommendations.



Regulatory Requirements Related to Project

Since this Proposed Project is an engineering study there are no permits associated with the implementation of this project. Recommendations (potential projects) made by this study will require extensive permitting in order to fully implement them. Review, coordination and permitting would be required with the New York State Department of Environmental Conservation (NYS DEC) in areas proximate to wetlands and the waterfront. Activities such as debris removal, culvert improvements, floodplain restoration and drainage upgrades will require NYS DEC approval under Freshwater Wetlands, Tidal Wetlands, Water Quality Certification or State Pollutant Discharge Elimination System programs. Each identified stream corridor contains regulated Freshwater and Tidal Wetlands.

Additionally, some of the stream corridors (Orowoc and Penataquit) still contain significant valuable riparian wetland areas which must be protected. As such, the NYS DEC Natural Heritage Program and other extant sources should be consulted for records of listed species of plants and animals inhabiting these systems. The Brightwaters Lakes system is a NYS DEC regulated Freshwater Wetland. Proposals to increase system capacity to drain stormwater, or modifications to the bed and banks will require Freshwater Wetlands, Protection of Waters and Water Quality Certification approval. Modification of the lake outlet structure in Brightwaters may require Dam Safety approval.

Community outreach and involvement of adjoining residential and business owners should also be undertaken as the project progresses during the planning and design stages.

Jurisdiction

Town of Islip, Suffolk County jurisdiction along Trues Creek (Gardiner County Park), Village of Brightwaters and potential NYS DOT jurisdiction if work is conducted within the Montauk Highway right-of-way and potential involvement of Home Owner Associations (e.g., the Admiralty in West Bay Shore) and New York State Department of Environmental Conservation.



PROPOSED PROJECT: **FIRE AND RESCUE COMMUNICATIONS**

Project Description

This project is to upgrade communication equipment to eliminate technical deficiencies and incompatibility of equipment between Greater Bay Shore's first response agencies and the Suffolk County OEM. This project may involve components such as the purchase and installation of a new permanent communications/dispatch system at the Bay Shore Fire Department Headquarters (HQ) as well as the installation of a communications tower at Sub-Station 1 (Union Blvd.) for line of sight to HQ, Sub-Station 2 (Tillie St. & Bedford Ave.) and LIJ Southside Hospital.

This Proposed Project also includes the purchase of up to five P25, Multiband Portable Radios with an optional base station. The P25 radio system is compliant with Telecommunications Industry Association (TIA) standards and is designed to meet the needs of public and life safety professionals. With this technology users on different systems can talk via direct radio contact as P25 radios are programmable to up to several hundred radio frequencies (some models accommodate upwards of 1,000 frequencies). As such, these radios would allow for effective, efficient, and reliable interagency communications which would facilitate seamless joint communication between various agencies (i.e., Suffolk County OEM, BSFD, Suffolk County Police Department, etc.) in both routine and emergency circumstances.

Background

The Bay Shore Fire Department (BSFD) is a volunteer fire-fighting corps currently serving the communities of Bay Shore, the Village of Brightwaters and West Bay Shore. All three communities comprise the Greater Bay Shore NY Rising Community Reconstruction (NYRCR) Planning Area. The BSFD played a critical role in the preparation for and the recovery from Superstorm Sandy. As first responders, members of the BSFD coordinated extensively with the Suffolk County Police Department, the Suffolk County Office of Emergency Management, the Town of Islip Office of Emergency Management, the Bay Shore-Brightwaters Rescue Ambulance, and other agencies that team together to respond to emergency and severe weather events within the Community.

FIRE AND RESCUE COMMUNICATIONS



Location

- Community-wide

Cost

- \$640,000

Needs

- Improved emergency information
- Reliable communication

Assets Made More Resilient

- All of Greater Bay Shore
- Bay Shore Fire Department
- Life Safety Service Providers
- Businesses and Residences in High Risk Areas
- Ferry Terminals

Risk Reduction & Benefits

- Improved reliability and emergency communication among first responders including the BSFD, Islip Office of Public Safety, Suffolk County Office of Emergency Management
- Improved response times and efficiency in responding to emergencies
- Improved coordination with ambulance providers and local hospitals
- Decreased vulnerability to prolonged recovery from emergencies/weather events
- Ability to better serve assisted living facilities and public housing developments



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Operating from three facilities within the Greater Bay Shore Community, the BSFD's need for a robust and resilient communications system is paramount to its planning, response and coordination functions. During Superstorm Sandy, the BSFD encountered significant issues in coordinating with other area agencies due to the incompatibility of their communications systems. The BSFD operates a system that is incompatible with other first responder's communication frequencies. There is a lack of radio communication with the Town of Islip and West Islip as well as the local ambulance service. As a result, first responders must coordinate rescue efforts through multiple handsets concurrently, cell phones, or other extreme means to insure appropriate and timely emergency response. This situation was particularly acute during Superstorm Sandy as the BSFD executed a large number of rescues and evacuations from flooded residential neighborhoods.

The BSFD's response capability is also becoming increasingly compromised as a result of a functionally obsolete and inadequate central alarm and dispatch system at their Headquarters on Fifth Avenue. This system was designed and installed in the 1970s and has reached the end of its useful life span. On average, the BSFD responds to approximately 1,000 calls per year. The BSFD is the second busiest fire department in Suffolk County. On the evening of Superstorm Sandy's land fall, the BSFD responded to more than 65 emergency calls. The communications system was stretched to its limits. This call volume represented a significant increase over their normal volume.⁶³ Once on-site, on the evening of October 29, 2012, first responders were further compromised in their ability to communicate with other fire departments and first responders due to the incompatibility of their communications systems.

To this day, the BSFD continues to respond to Sandy-related issues (mostly electrical in nature). Associated with these proposed communications improvements is the installation of a line-of-sight emergency communications tower at the BSFD's Sub-station 1. This would permit for reliable communications between the Fire Headquarters, Sub-station 2 and LIJ Southside Hospital.

Estimated Project Cost

The approximate conceptual costs for this project are estimated to be \$640,000, which includes \$350,000 for the purchase and installation of a new communications and dispatch system, \$35,000 for the purchase of five (5) Multiband Portable Radios with a base



Bay Shore Fire Department Headquarters,
Fifth Avenue in Bay Shore
Source: Jacobs



Bay Shore Fire Department Insignia
Source: Jacobs



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station, and \$60,000 for the purchase and installation of a lattice communications tower at Sub-station 1. This total cost also includes a contingency of \$110,000 and design/procurement/permitting costs of \$83,000.

The existing dispatch and communications system at the BSFD Headquarters is currently manned 24/7 by a professional dispatcher. This will continue in the future and as a result no new operating costs will be incurred as a result of this Proposed Project. The estimated yearly maintenance cost associated with this Proposed Project is \$5,000 per year. Assuming an average useful life of 30 years, the maintenance cost for the life of the project has been estimated at \$150,000. The implementation of this project will result in an estimated life cycle cost of approximately \$790,000.

Project Benefits

Risk Reduction and Resiliency

Communication was a major challenge for the BSFD during Superstorm Sandy, particularly for fire personnel working in extremely challenging conditions. By making critical upgrades to the central alarm and dispatch system, this project is anticipated to improve cross-agency communication and coordination in the event of a disaster or emergency by creating a platform that enables efficient, reliable, and consistent communication.

Improved communication for fire, police, and other emergency service personnel in the event of a disaster allows for improved response time that could result in a reduced risk of injury and property loss or damage.

The implementation of this Proposed Project would make the entire Greater Bay Shore Planning Area more resilient as the procurement and installation of this communications equipment would improve preparedness and recovery for storm and emergency events. The potential beneficiaries include all Greater Bay Shore residents (34,088) and local business owners (approximately 1,700 individual businesses) that would enjoy more efficient response times and improved emergency service capacity.⁶⁴

The vast majority of Superstorm Sandy-related rescues occurred south of Montauk Highway towards the bayfront (e.g., South Clinton Avenue, Bayview Avenue, Ocean Avenue, and Maple Avenue). This project would help to reduce risk for the residents in



An enhanced communications system would allow for improved communications between first response providers.

Source: Bay Shore-Brightwaters Rescue Ambulance



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these neighborhoods as well as the marine and commercial uses proximate to the waterfront.

Risk reduction benefits will also be captured in the long term. First responders will be able to quickly assess the community's needs/available resources during storm events, potentially minimizing a future storm's impact to the local government budget and services.

This enhanced system would also benefit the hundreds of thousands of tourists and visitors who pass through Bay Shore each year to access Fire Island through the Community's extensive ferry network as well as during severe events that might require the evacuation of Fire Island. All of Greater Bay Shore as well as Fire Island would benefit from the enhanced resiliency provided by this project as a result of the increased reliability and interconnectedness of communications equipment.

Economic Benefits

This project would not generate FTE jobs since it involves the procurement and purchase of emergency communications and dispatch equipment. The implementation of this project would maintain the 3 FTE jobs that currently are in place at the BSFD's full-time Dispatch Center.⁶⁵ This project would reduce future storm-related emergency and recovery costs for residents and businesses of Greater Bay Shore because the Bay Shore Fire Department would be available to more quickly and efficiently respond to and recover from emergency events.

With the implementation of this project, the BSFD would be able to more efficiently respond to and assign its staff. Communications with other first responders on both a local and regional scale would be optimized. The ability to assess an emergency, determine the magnitude of the event, and direct the appropriate equipment and personnel to respond would be greatly improved. Moreover, safety for the individual first responders who might be deployed in the field as well as those being saved would be enhanced by this improved communications equipment.

Environmental Benefits

Improvements to communications equipment would allow the BSFD to respond more quickly to emergency events that result in potential environmental degradation such as flooding or hazardous waste leaks/spills. Swifter response by appropriately trained



Sample P25 Radio Equipment



personnel and equipment will help to minimize the potential for environmental degradation.

Health and Social Benefits

The improvements to the BSFD's central dispatch and communications systems would benefit all of Greater Bay Shore's residents, businesses and visitors. This includes vulnerable populations such as the elderly and individuals with disabilities. These improvements would improve response times and service to both the Atria Assisted Living community at 53 Ocean Avenue and the Open Gate Association Home for the Aged at 36 South Clinton Avenue in Bay Shore. Both of these facilities are located south of Montauk Highway in the area of Superstorm Sandy inundation. This project relates to overall resiliency and security that would accrue to Greater Bay Shore since life safety services would be better able to respond more efficiently to emergency situations and perhaps lessen human loss and injury. This proposed project would also serve a regional need by benefiting visitors and tourists who access Fire Island through Bay Shore.

Cost Benefit Analysis

Project cost: \$640,000

Life-cycle cost: \$790,000

Recurring costs: Though recurring costs are captured in the life-cycle costs, it should be noted that operations and maintenance costs will be the responsibility of the implementing entity or other project partner.

External costs: Potential external costs of this project include the visual impacts of the lattice tower, depending on its height and where it is situated. Also, it will take time to set up the new system and communications infrastructure. Depending on the location of this lattice tower and infrastructure, additional negative costs could be imposed in the surrounding area due to disruptions related to installation of new infrastructure (e.g., construction impacts related to potential increased traffic due to construction deliveries, limited shutdowns to adjacent roadways).

Groups impacted: This project would directly benefit the entire Community by providing faster and more efficient emergency response. As the majority of rescues occurred south of Montauk Highway, the population in this area would particularly benefit, as would vulnerable populations in greater need of emergency



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services. Residents and businesses in the extreme- and high-risk areas (including 862 residences and 46 businesses⁶⁶) would also benefit from this project. First responders will also be safer when they are able to communicate more clearly and efficiently.

Savings: To the extent that first responders are able to more efficiently perform rescue operations, this could result in reduced municipal spending.

Opportunity cost: If this project is not implemented, first responders will have a more difficult time performing rescues and providing other services. In a worst-case scenario, the 34,088 Community residents and 801 businesses in the hazard areas (moderate, high, and extreme) would face increased rescue time due to inefficient communication, or no rescue at all, if communication options continued to deteriorate or communication became impossible. An analysis of the businesses in the extreme- and high-risk hazard areas shows that these businesses have a weekly combined sales volume of \$3,004,808.⁶⁷ For each week these businesses remain closed, millions of dollars in sales could be lost. Also, without this project, there will be hindrance in provision of safety services.

Risk Reduction Analysis

This project was not advanced through the Risk Assessment Process as it is difficult to quantitatively assess the level of Risk Reduction for this type of project. The project would increase resiliency throughout the Community through better coordination among departments and decreased emergency response times. The most significant risk reduction that can be realized through this project will be to the area's first responders as well as Greater Bay Shore's 34,088 residents who will have faster and more reliable emergency response services in future emergency situations. All emergency responders and other cooperating regional first responders would be better prepared to serve those in need with this upgraded infrastructure.

General Timeframe for Implementation

It is estimated that, from the time implementation begins, this Proposed Project has potential for midterm implementation (12 to 18 months). Engineering plans will need to be prepared (4-5 months) and submitted for review and approval. Application to the Islip Planning Board for a Special Permit and Site Plan Approval and application to the Building Department for Building Permits (6 months) would also be necessary. Upon receiving necessary



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approvals, bid documents will be prepared and contractor(s) to conduct the work will be selected (3 months). The project will then be constructed per the contractor schedule submitted during the bidding process. Construction is anticipated to take 4-5 months, depending on the system component, time of year, weather, or other variable factors.

Regulatory Requirements Related to Project

The implementation of the communications improvements would require approvals from the Town of Islip Building Department. The addition of the communications tower could also require Special Permit and Site Plan Approval from the Town of Islip Planning Board (*Islip Town Code Section 68-4201*). In addition, approvals may also be necessary from the Federal Communications Commission (FCC) and the Federal Aviation Administration (FAA) for the communications tower.

Jurisdiction

Bay Shore Fire Department and the Town of Islip's Building Department and Planning Board.



PROPOSED PROJECT: FIRE AND RESCUE EQUIPMENT

Project Description

This project would improve the BSFD's inventory of Search and Rescue equipment through the purchase of a repurposed emergency high water rescue vehicle as well as flood rescue watercraft, floating pumps and/or skid pumps, and immersion survival (cold-water exposure) suits or comparable equipment.

Background

Currently, Bay Shore Fire Department (BSFD) personnel lack the appropriate gear to conduct search and rescue operations in a flood condition. The BSFD has no vehicles capable of undertaking rescues in high water during times of flooding or appropriately sized and motorized flat-bottomed rescue boats. During Superstorm Sandy the BSFD was forced to improvise and undertake extreme action to evacuate residents during the flooding. These actions involved multiple first responders wading through waist deep water to access private homes and evacuate residents onto small inflatable boats. Due to their instability and lack of out-board motors, these boats required four firefighters to walk alongside and drag the inflatable to high land. This was inefficient in the use of first responder's time and energy, dangerous due to the instability of the inflatable and potentially harmful to the accompanying first responders who needed to wade through storm water potentially contaminated with hazardous materials and blocked with debris. Many of these rescues involved the removal of senior citizens or the infirmed who have limited ability to assist themselves during this makeshift procedure. Additionally, first responders do not possess cold-water immersion suits and currently operate in structural firefighting gear which is not intended for or safe to use in a flood condition. The lack of appropriate gear limits the amount of time they can participate in similar flood events and requires the constant and inefficient cycling in and out of rescue crews to avoid hypothermia.

During Superstorm Sandy crews were also limited in their ability to fight fires and pump out critical facilities due to the lack of floating pumps as well as the corrosive effects of salt water on traditional firefighting apparatus. During times of severe flood, hydrants are submerged and their locations are not apparent. The ability to setup ground mounted pumps was constrained due to absence of available dry ground. The ability to deploy floating pumps that

FIRE AND RESCUE EQUIPMENT



Location

- Community-wide

Cost

- \$168,000

Needs

- Adequately equip first responders

Assets Made More Resilient

- All of Greater Bay Shore
- Bay Shore Fire Department
- Residential housing and businesses in the Residual, Moderate, High and Extreme Risk Areas

Risk Reduction & Benefits

- Improved access, response times and efficiency in responding to emergencies
- Decreased vulnerability to prolonged recovery from emergencies/weather events
- Improved emergency evacuation and response capacity
- Improved ability to rescue seniors and those with limited mobility
- Minimized exposure to hazardous materials common in flood water



Greater Bay Shore NY Rising Community Reconstruction Plan

utilize the floodwater itself, to suppress fires or to quickly pump out critical facilities is crucial to the Community's resiliency. The procurement of this life safety equipment would elevate the emergency preparedness of the Greater Bay Shore first responders during storms and other critical situations.

Estimated Project Cost

The approximate conceptual costs for this project are estimated to be \$168,000 which includes \$50,000 for the purchase of a repurposed High Water Rescue Vehicle, \$38,000 for the purchase of two 16-foot Aluminum Flat Bottom/Shallow Water Rescue Crafts, \$12,000 for the purchase of two outboard jet-pump 15 horsepower motors, \$2,000 for the purchase of two trailers for transporting the 16-foot rescue craft, \$10,000 for the purchase of ten (10) cold water immersion suits, and \$10,000 for four (4) floating pumps and/or skid pumps. This total cost also includes an allowance of \$30,500 for contingencies and \$15,000 related to procurement and other soft costs.⁶⁸

The estimated operation and maintenance cost associated with this package of equipment is approximately \$6,200 per year. Assuming an average useful life of 20 years for this search and rescue equipment package, a conceptual operations and maintenance cost of \$124,000 has been estimated. Assuming an average useful life of 10 years for the cold water immersion suits, a conceptual operations and maintenance cost of \$20,000 has been estimated. The entire package of equipment has an estimated life cycle cost of \$312,000.

Project Benefits

Risk Reduction and Resiliency

The implementation of this Proposed Project would make the Greater Bay Shore Planning Area more resilient because the procurement of this specialized emergency response and disaster recovery equipment would help to address existing equipment deficiencies and facilitate greater preparedness and capacity of services and improved responses to storm and emergency events.

This emergency equipment will reduce risk during land and water rescue operations. In addition, properly equipping first responders will reduce the risk of injury and death to residents as well as the responders themselves.



BSFD rescue operations on S. Clinton Avenue during Superstorm Sandy.
Source: Bay Shore Fire Department



BSFD rescue of resident via non-motorized inflatable raft.
Source: Bay Shore Fire Department



Greater Bay Shore NY Rising Community Reconstruction Plan

The entire Community would benefit from the enhanced resiliency provided by the increased availability of this vital life safety/search and rescue equipment. More specifically, this project would benefit elderly residents at the Atria Senior Living facility on Ocean Avenue, residents in numerous apartment buildings on the southerly portion of South Clinton Avenue (such as Brookwood Apartments, Laurel Apartments, and The Birches). The ferry terminals (Fire Island Ferries, Point O' Woods Ferry Terminal) as well as municipal docks and marinas would also be well served by the Proposed Project. This potential project would also have a regional benefit in that it would also serve the hundreds of thousands of Fire Island visitors who pass through Bay Shore on a regular basis as well as support any potential evacuation operation related to Fire Island in the event of severe weather or other hazard.

Potential areas that would benefit include locations inundated by Superstorm Sandy along South Saxon Avenue, Awixa Avenue, Penataquit Avenue, Shore Lane, Aldrich Court, Maple Avenue, Ocean Avenue, South Clinton Avenue, Garner Lane, Concourse East and West as well as portions of Main Street/Montauk Highway.

Economic Benefits

This project would not generate FTE jobs since it involves the procurement and purchase of emergency rescue equipment that was lacking during the rescue efforts associated with Superstorm Sandy. However, this project would reduce future storm-related emergency and recovery costs for Greater Bay Shore, the Bay Shore Fire Department, and residents as modernized equipment would help first responders to more quickly and efficiently respond to and recover from emergency events. The BSFD would be able to more efficiently assign its personnel based on the use of this equipment. Rather than four first responders accompanying one small inflatable rescue craft as happened during Superstorm Sandy, two first responders could utilize a powered, aluminum bottomed craft to make multiple rescues and evacuations within residential neighborhoods in one trip. This benefit would be accrued during each rescue/evacuation procedure across the entire Planning Area.

Environmental Benefits

This project would result in environmental benefits as it would enhance the ability of first responders to respond more quickly to hazardous materials and liquid fuel spills, thereby reducing contamination to waterways that can adversely affect marine habitat and aquatic life.



Floating pump (11 horsepower) and Search and Rescue drysuit.

Source: Bay Feld Fire; Rock-N-Rescue



Refurbished 5-ton, high-water rescue vehicle.

Source: KS Engineers, PC; Memphis Equipment



Health and Social Benefits

The procurement of this mission critical equipment would benefit all residents, including vulnerable populations such as the elderly and individuals with disabilities. This project relates to the overall resiliency and security that would accrue to the area since life safety services would be better able to respond to emergency situations and perhaps lessen human loss and injury.

Additionally, this project would provide direct health benefits to first responders who had previously needed to wade through flood waters that were often contaminated with potentially hazardous materials such as heating oil, gasoline or other products. The use of this equipment would allow first responders to minimize contact with flood waters. The same would be true for those who are being rescued during emergency events. Based on the descriptions from the BSFD, many of these people are seniors or those with limited mobility who may have compromised health to begin with.

Cost Benefit Analysis

Project cost: \$168,000

Life-cycle cost: \$312,000

Recurring costs: Though recurring costs are captured in the life-cycle cost, it should be noted that operation and maintenance costs will be the responsibility of the implementing entity or other project partner.

External costs: Storage space taken up by equipment may require the displacement of other equipment or the need to secure new storage areas. Interviews with members of the BSFD indicate that they believe that sufficient space exists; however no formal review of this has been undertaken.

Groups impacted: This project would cut the number of first responders needed to oversee and guide a rescue vehicle in half, creating capacity to provide additional emergency services. This project would aid the entire Community, although those in need of emergency services would benefit the most. As many of the rescues were of elderly and/or infirm residents, this project would aid this vulnerable population (4,446 Community residents 65 years and older). First responders would also benefit from safer working conditions. Groups who would particularly benefit include residents (up to 150) at the Atria Senior Living facility on Ocean Avenue, and



Greater Bay Shore NY Rising Community Reconstruction Plan

residents of numerous apartment buildings on the southerly portion of South Clinton Avenue (such as Brookwood Apartments, Laurel Apartments, and The Birches).

Savings: To the extent that first responders are able to more efficiently perform rescue operations, this could result in reduced municipal spending. Additionally, the provision of a High Water rescue vehicle could reduce wear and maintenance on existing fire fighting vehicles that are currently utilized for rescues.

Opportunity cost: If this project is not implemented, provision of rescue services could continue to be hindered: people will have to wait longer for rescue services, and both first responders and those rescued will remain vulnerable to flooding and contaminated water.

Risk Reduction Analysis

This project was not advanced through the Risk Assessment Process, as it is difficult to quantitatively assess the level of Risk Reduction for equipment purchases. However, the implementation of this Proposed Project will improve the resiliency of the entire Planning Area by procuring much needed equipment to address preparedness for life safety and emergency events. This project would have positive public safety and resiliency benefits for Greater Bay Shore during future emergency events by increasing the availability of life safety services for the entire Community and for rescuing vulnerable populations such as the elderly, individuals with disabilities, and children prior to, during and after storm events and other emergencies. The residents, businesses and visitors of Greater Bay Shore will be at reduced risk from injury or death due to the availability of this vital emergency rescue and response equipment. The project would also help to mitigate property loss or damage for many assets throughout the Community.

General Timeframe for Implementation

It is estimated that, from the time implementation begins, this Proposed Project has potential for immediate implementation (0 to 12 months).

Regulatory Requirements Related to Project

The BSFD has available space for the storage of this equipment. Regulatory review of this project is not anticipated. No real property or other significant constraints have been identified to date for this project that enjoys significant public support.



Jurisdiction

Bay Shore Fire Department and Board of Fire Commissioners.



PROPOSED PROJECT: **ENHANCED GIS EMERGENCY MANAGEMENT SYSTEM**

Project Description

As part of a regional, shared cost partnership with the Town of Islip and its other Community Reconstruction areas (West Islip, Fire Island, and Oakdale/West Sayville), this project would enhance a Town-Wide Geographic Information System (GIS) that would improve storm preparedness planning, real-time response, and recovery from severe storm events. In addition, this type of system would also assist with damage assessment and other post-storm recovery activities. This project would involve the design and implementation of an enhanced GIS system. This effort would build off of the Town of Islip's existing GIS data capabilities and involve the development of a user interface and protocols focused specifically on preparedness, response, and post-disaster evaluation and record keeping. This project is consistent with a similar project identified in the West Islip, Fire Island, and Oakdale-West Sayville NYRCR Plans.

Background

The Town of Islip experienced a devastating shock to their Emergency Management Information System during Superstorm Sandy. The Town's Public Safety call center was inundated with phone calls from residents who were reporting damage to their homes and property, electrical outages, and medical emergencies. The Town was tasked with recording these call events and reports, assessing the severity of the incident, and then dispatching the appropriate resources to the location.

To compound the problem, the electrical power to the Town's Information Technology (IT) Division was lost and the emergency generators could not provide sufficient power to keep the computer system operable. Floodwaters entered the IT Division and prevented the use of the network. As a result, the existing GIS infrastructure could not be used to track the locations of the incidents nor could the public safety and DPW crews be tracked. A makeshift system was cobbled together at Islip's Town Hall West location where the information was collected and mapped via cellphones and runners into the field. This was a herculean effort that assisted with the deployment of resources to the correct locations.

ENHANCED GIS EMERGENCY MANAGEMENT SYSTEM



Location

- Community-wide

Cost

- \$50,000 (as a partial contribution to a larger regional project)

Needs

- Improved emergency information procedures and response

Assets Made More Resilient

- Public facilities and infrastructure within Greater Bay Shore
- Residential housing in the Residual, Moderate, High and Extreme Risk Areas
- Downtown Bay Shore
- Marina Waterfront District
- Village of Brightwaters & Orinoco Drive Commercial District

Risk Reduction & Benefits

- Increased efficiency of resource mobilization and documentation
- Improved coordination and response pre-and post-storm



Greater Bay Shore NY Rising Community Reconstruction Plan

However, this emphasized the need to seek out solutions to provide a more robust, real-time GIS system to manage this information, track damage, coordinate response and document costs associated with storm events. While the Town has had a GIS system for many years, the system has not been updated and is not adequate to accommodate the needs of the Town to manage severe storm events and other disasters.

The enhanced GIS system will enable more efficient communication and record keeping among Town agencies and emergency responders. The system will track incoming reports of flooding, damages, utility outages and blocked roads and enable more rapid and efficient deployment of resources. The system will also allow for better record keeping of storm response and damage, providing better accountability and reimbursement of eligible costs to FEMA, the State, and any other agencies. The project is technically feasible and involves the use of demonstrated technology. In addition, this type of project has been identified in three other NY Rising Community Reconstruction Plans (NYRCR) situated within the Town of Islip: the Oakdale-West Saville, Fire Island, and West Islip NYRCR Plans (April 2014). By way of example, a similar system was implemented by the State of Vermont and many other communities with proven success.

The system would be based upon a full web-GIS interface. Proposed applications could include:

- **e911 Information:** enable e911 operators and responders to communicate with one another;
- **Road Obstruction Application:** track fallen trees, downed power lines, and other road obstructions;
- **Damage Assessment:** provide initial damage assessment to FEMA as well as organize and track recovery data essential for FEMA reimbursement;
- **Public Information:** provide key information to the public in advance, during, and after emergency events; and
- **Maintenance:** track crucial maintenance activities related to infrastructure that could help alleviate or limit future flooding.

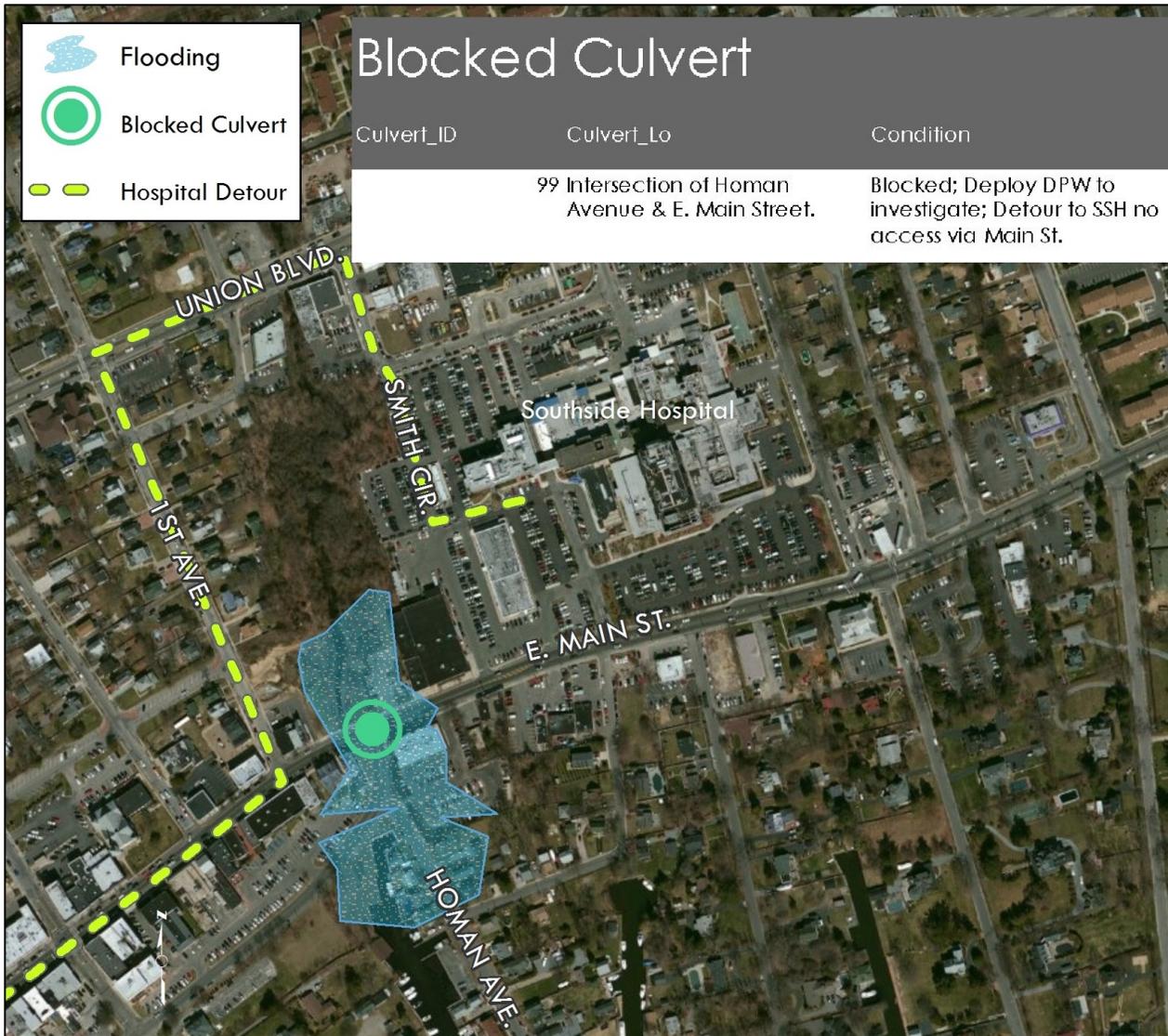


Figure 8. Sample GIS for Disaster Response

GIS can be used for coordinated disaster response in real-time related to a blocked culvert and resultant flooding. GIS also provides the opportunity for asset management and keeping track of related maintenance expenditures.

Estimated Project Cost

The estimated approximate cost of this Proposed Project is a contribution of \$50,000 which includes capital and soft costs required for project implementation. The anticipated overall cost of this project, including additional contributions from the Town of Islip, as well as other local NYRCR Communities (Oakdale-West Sayville, Fire Island, and West Islip) is estimated at \$300,000. This project would be implemented as an Islip Town-wide regional asset.



The Committee is proposing an allocation of \$50,000 towards the overall project costs. It is anticipated that the Town of Islip, will provide the balance of the funds.

Typical database maintenance and field updating of GIS data is an existing cost that the Town of Islip presently incurs and must be continued to ensure that software capabilities are maximized during an acute event. GIS software licenses are also costs that the Town of Islip already incurs. Additional funding sources would need to be identified for utilization of this capability by field employees.

Project Benefits

Risk Reduction and Resiliency

The procurement and roll-out of the GIS Emergency Management System could potentially enhance the efficiency and coordination of response and recovery activities by the Town of Islip and other governmental entities, thereby reducing public health, safety, and financial risks. Risk reduction benefits from this Proposed Project in the short term include the reporting of fallen trees in real-time that pose threats to life and property. The system would be able to track incoming reports of flooding, damages, utility outages, and medical emergencies. As a result, the system would enable the rapid and efficient deployment of resources. Risk reduction benefits would also be captured in the long-term. The ability to track costs and resources would allow the Town of Islip to document and report actual costs to FEMA and the State for quick reimbursement, thereby minimizing a future storm's impact to the local government resources, budget, and services.

Additional long-term risk reduction associated with the implementation of this system would be improved and timely maintenance of infrastructure such as storm drains which would reduce future flooding and associated costs.

Economic Benefits

The implementation of this project will not create any FTE jobs as the Town of Islip currently utilizes an existing GIS system and has sufficient staff to operate an enhanced system. This project will allow for a more comprehensive and robust system at comparable costs to those already incurred by the Town. Additional costs to the Town of Islip may include retraining employees to fully utilize this system.



The use of the enhanced GIS system during preparation, response, and recovery phases of future disasters will reduce government expenditures by: (1) creating complete and comprehensive documentation of disaster-related costs for rapid reimbursement, (2) providing real-time transmission of accurate, time-sensitive emergency information to increase timeliness of response efforts, and (3) creating data for after-action reporting and lessons learned that can be used to improve preparedness and resource allocation for future storm events. Over the long-term recovery period, the expedient reimbursement of disaster response costs can free up local funding to both return government operations to “business as usual” and make local funds available for upfront costs related to recovery projects (e.g. preliminary design work, funding programs by reimbursement only, etc.).

Health and Social Benefits

During disaster situations, labor and equipment resources are often scarce and timing of their use can be critical. The immediate transmission of information to the appropriate entities about flooded roadways, fallen trees and power lines, drainage pump failures, and other common occurrences can mean the difference between a safe and orderly evacuation and a chaotic one. Furthermore, an enhanced GIS program would allow the system to assign a specific location to each structure in the Community, enabling emergency responders to locate an address more quickly. This is vital for accessing and providing services to vulnerable populations in the Community. The program would also facilitate inter-agency coordination with the Suffolk County Emergency Preparedness Registry, which includes a database of people with special and/or functional medical needs. Additionally, the project is expected to help create better coordination among first responders.

Cost Benefit Analysis

Project cost: \$50,000

Life-cycle cost: \$50,000

Recurring costs: Though recurring costs are captured in the life-cycle cost, it should be noted that operation and maintenance costs will be the responsibility of the implementing entity or other project partner.

External costs: External costs would come from time spent educating staffers on how to use the latest technology.



Greater Bay Shore NY Rising Community Reconstruction Plan

Groups impacted: Benefits of this project are mainly due to more rapid and efficient deployment of resources. This project would benefit the entire Community, as well as residents of the other participating communities. Vulnerable populations in need of rescue services would also benefit. While the project would not provide direct rescue advantages, Community needs could be tracked and managed more efficiently. The project would also provide post-storm benefits such as damage and recovery needs assessments.

Savings: To the extent GIS is needed and could be used for other purposes, an enhanced GIS system would already be in place and could be used for other municipal projects. Additionally, the proposed improvements would potential result in a cost savings related to record keeping and accounting for expenditures related to reimbursable activities during emergency or storm events.

Opportunity cost: If this project is not implemented, the Greater Bay Shore Community, along with the Town of Islip, will not realize potential efficiencies of response, recovery, and documentation of costs. Further, the opportunity to improve response times, more effectively utilize first responder personnel, and equipment as well as facilitate a more rapid recovery from disaster would not occur.

Risk Reduction Analysis

A Risk Reduction Analysis was not undertaken for this project. However, this Proposed Project offers the ability to manage information related to asset risks, vulnerability, damage and repair. By having a centralized data management system in place, Greater Bay Shore could more efficiently identify those assets that are at most risk in the event of future storms for repair and replacement. The most significant risk reduction would be to Greater Bay Shore's 34,088 residents who will have faster and more reliable emergency response services in future emergency situations.

General Timeframe for Implementation

Training and roll out of this project, from the time implementation begins, could be completed in the short-term (0 to 12 months).

Regulatory Requirements Related to Project

No permits or regulatory requirements are anticipated for this Project. Coordination with other entities related to data management would be required (e.g., PSEG, BSFD, BSBRA,



Greater Bay Shore NY Rising Community Reconstruction Plan

emergency service providers, Village of Brightwaters, Suffolk County OEM).

Jurisdiction

Town of Islip.



PROPOSED PROJECT: **PENATAQUIT VILLAGE HOUSING RESILIENCY ENHANCEMENTS**

Project Description

This Proposed Project is to install a series of “Green” drainage improvements on a Town of Islip-owned parcel with existing multi-family residential housing. The project includes the replacement of existing area drains with leaching pools, and the replacement of the existing lawn adjacent to Penataquit Creek with a vegetated swale to direct storm drainage into the creek. A stormwater treatment structure with high flow bypass will be installed at the existing catch basin in the northwest portion of the property (which is currently receiving off-site stormwater runoff). This project is identified in the Great Cove Watershed Management Plan (GCWMP).

This project would help to filter out pollutants of concern, and reduce localized flooding, thereby maintaining access to neighborhood roadways as well as Union Boulevard. In addition, the project would improve the resiliency of the Penataquit Village Housing Development itself. As a result, the project would benefit Vulnerable Populations including the elderly, individuals with disabilities, and low-moderate income (LMI) individuals.

Background

The GCWMP was completed by the Town of Islip in 2012 with funding from the New York State Department of State (NYS DOS). The study focused on the drainage contributing area to Great Cove, a coastal inlet that connects to the Great South Bay and extends from, approximately, Robert Moses Causeway in West Bay Shore to Heckscher State Park in East Islip. There are ten main creeks that contribute to Great Cove, seven of which are within or adjacent to the Greater Bay Shore Community. The plan was developed to provide watershed-wide and site specific recommendations for watershed and water quality improvements, and provide implementation strategies for each of the watershed recommendations.

Although the primary purpose of the plan was to provide recommendations to improve water quality in Great Cove and in the larger South Shore Estuary, such improvements can also improve

PENATAQUIT VILLAGE HOUSING RESILIENCY ENHANCEMENTS



Location

- Federally Subsidized Housing Development located at Lakeview Avenue and Mill Pond Road, Bay Shore.

Cost

- \$235,000

Needs

- Minimize local flooding on roadways
- Improved ability to circulate in area
- Improved resiliency of adjacent housing

Assets Made More Resilient

- Penataquit Village Town Housing Development
- Vulnerable Populations including elderly and LMI
- Union Boulevard
- Penataquit Creek

Risk Reduction & Benefits

- Decreased vulnerability to flooding
- Improved ingress and egress from homes during flood events
- Improved access to adjoining roadways like Union Boulevard



coastal storm resiliency. This Proposed Project was identified as part of the Great Cove Watershed Management Plan. The Penataquit Village Housing Development is administered by the Town of Islip Housing Authority and maintains 134 subsidized housing units. The Penataquit Creek flows through the development and crosses below Mill Pond Lane in a series of culverts. During Superstorm Sandy the Creek overflowed as a result of water backing up from the Bay. The Bay Shore Fire Department indicated that access to the site along adjoining roadways was blocked and people wishing to leave the complex were limited as to potential evacuation routes. Improvements to the creek and its ancillary structures along this property would reduce flooding and provide improved access and egress to the site during severe weather events.

Estimated Project Cost

Total project cost for this improvement is \$235,000 including \$40,000 in contingency cost and \$20,000 in design, permitting and construction management costs. The estimated operations and maintenance costs associated with this project are approximately \$1,000 per year. Assuming an average 30 year useful life for this improvement, a conceptual life cycle cost of \$265,000 has been estimated.

Project Benefits

Risk Reduction and Resiliency

The Great Cove Watershed is a key natural resource. Improved health and management of the watershed is vital for reducing local flood impacts - particularly during events such as Superstorm Sandy. This Proposed Projects could potentially reduce local flooding and improve local water quality, which benefits all residents within the Community as well as the greater watershed and region. This project would reduce risk to the residents of the subsidized Penataquit Village Town Housing Development by reducing flooding on the complex property as well as along adjoining roadways.

Economic Benefits

The improvement of coastal resiliency through healthier and more vibrant natural systems would benefit the local economy. This would occur through a reduction of storm damage as well as through an increase in commercial and recreational fish and shell fish harvest opportunities (as a result of improved water quality).



Figure 9. Penataquit Village Housing Resiliency Enhancements

Source: Jacobs; conceptual design derived from the Great Cove Watershed Management Plan.



Greater Bay Shore NY Rising Community Reconstruction Plan

The project is consistent with the recommendations of the Long Island Regional Economic Development Council (REDC) Economic Development Plan which recommended the following strategy: “Protect Long Island from the perils of climate change at the same time we encourage new “cleaner, greener” industries by leading collaborative regional efforts to harden our infrastructure, businesses and homes against the next major storm and to encourage transportation, energy and construction policies that reduce our vulnerability, as well as our carbon footprint.”⁶⁹

The project would create jobs associated with the preparation of the plan. This is estimated at approximately 6 FTE temporary jobs.⁷⁰ There are no operations and maintenance costs associated with the preparation of the plan.

Environmental Benefits

Implementation of any of the projects proposed in the Great Cove Watershed Plan could significantly improve water quality in the creeks, inlets and bays in the central portion of the South Shore Estuary. This is particularly important given that the estuary has been classified as an impaired water body based on Federal Clean Water Act standards. Improved water quality will benefit marine life including fish, shellfish and aquatic vegetation. It would help to restore the environmental systems in the bay to their natural functioning.

Cost Benefit Analysis

Project cost: \$235,000

Life-cycle cost: \$265,000

Recurring costs: Though recurring costs are captured in the life-cycle cost, it should be noted that operation and maintenance costs will be the responsibility of the implementing entity or other project partner.

External costs: Roads may be closed and local businesses and residents could be inconvenienced during construction.

Groups impacted: This project would reduce vulnerability in a moderate-risk residential area. Critical assets such as the Penataquit Village Town Housing Development and Union Boulevard (a major east-west roadway would be secured. Residents living at the Housing Development include seniors and Low and Moderate Income (LMI) community members. Other assets close to this



Penataquit Creek courses through the Penataquit Village residential development.

Source: Great Cover Watershed Management Plan



Greater Bay Shore NY Rising Community Reconstruction Plan

location include: the Long Island Rail Road right-of-way; the Bay Shore-Brightwaters Ambulance Corp; the LIJ South Side Hospital; and a mix of commercial and industrial uses.

Savings: Savings will potentially be accrued as a result in reduced damage from future flooding, improved efficiency for first responders resulting from better access, and reduced disruptions to businesses in the area from reduced flooding.

Opportunity cost: The assets listed above may become flooded during future storm events; 10,000 cars per day may lose access to Union Boulevard should this project not be implemented.

Risk Reduction Analysis

Enhanced flooding protection from this project is expected to reduce the vulnerability of residential areas, especially the Penataquit Village Town Housing Development within a moderate risk area. Additionally, this project is anticipated to potentially reduce vulnerability to other critical assets, such as the Union Boulevard, The Bay Shore-Brightwaters Ambulance Corp and the LIJ South Side Hospital downstream along the Penataquit Creek.

General Timeframe for Implementation

From the time that implementation begins, it is estimated that the project could be completed in less than 12 months. Design and procurement would take approximately 4 months, environmental permitting approximately 4 months, and approximately 4 months for implementation.

Regulatory Requirements Related to Project

One or more of the following approvals will likely be required for each project:

- New York State DEC Freshwater Wetlands permit
- New York State DEC Tidal Wetlands permit
- New York State DOS Coastal Consistency approval
- Town of Islip Wetlands and Watercourses permit
- Town of Islip Highway Work permit
- Compliance with the State Environmental Quality Review Act (SEQRA)



Greater Bay Shore NY Rising Community Reconstruction Plan

Jurisdiction

The jurisdiction of this Proposed Projects would be under the jurisdiction of the Town of Islip as well as the Housing Authority of the Town of Islip.



FEATURED PROJECT: PHASES II & III: BRIGHTWATERS CANAL RESILIENCY IMPROVEMENTS

Project Description

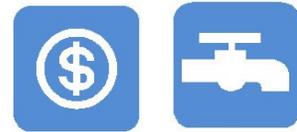
This Featured Project (**Phases II & III**) would involve the replacement of deteriorated and/or damaged bulkheading along portions of the Canal. This resiliency project would provide for increased height where appropriate, to match the height of bulkheading closer to the Bay. This total improvement to 1,000 linear feet of bulkhead has been proposed to occur in two (2) 500 linear-foot phases. This project could help to ease flooding on Montauk Highway, property damage along Concourse East and West, and also benefit the Southwest Sewer District pump station near Walker Park.

Background

The Brightwaters Canal stretches approximately 3,700 feet from the Great South Bay to its terminus adjoining Montauk Highway. The 160-foot wide canal has moorings for more than 200 boats along its length and provides access to the Bay for large and small boats alike. Unlike many of the smaller canals on the South Shore of Suffolk County, this canal contains a sufficient draft for boats to come and go regardless of the tide. The moorings along the canal are also owned by the Village of Brightwaters and the ability to continue to collect mooring fees is crucial to the Village's economic resiliency.

Superstorm Sandy battered the canal and the two adjoining roadways - Concourse East and West. Sections of bulkheading have been severely weakened and undermined as seawater from the canal has infiltrated the damaged bulkheads and created cave-ins in the adjoining land areas. The tidal surge from Superstorm Sandy damaged bulkhead systems allowing unimpeded flooding of adjacent neighborhoods and erosion of land behind the structure. The existing public bulkheads are cracked, not sealed properly to the outfall pipe, and have separation between the bulkhead and the adjacent land. In spite of many years of appropriate maintenance and upgrades, the damage from Superstorm Sandy continues to reveal itself with each passing storm. The ability to replace the most damaged sections of bulkheading and increase the height of the bulkheading by 18 inches, as permitted by the New York State Department of Environmental Conservation (NYS DEC), will help to attenuate wave action in the Canal and reduce flooding to property

PHASES II & III: BRIGHTWATERS CANAL RESILIENCY IMPROVEMENTS



Location

- Brightwaters Canal adjacent to Concourse East & West (Village of Brightwaters)

Cost

- Total Cost: \$1,354,000
 - Phase II: \$677,000
 - Phase III: \$677,000

Needs

- Minimize local flooding on roadways
- Improved ability to circulate in waterfront area
- Improved resiliency of adjacent housing and waterfront economy

Assets Made More Resilient

- Residential housing along Concourse East & West
- Montauk Highway
- Sanitary Pump Station
- Moorings in Brightwaters Canal

Risk Reduction & Benefits

- Decreased vulnerability to flooding
- Improved ingress and egress from homes during flood events
- Improved access to adjoining roadways and Montauk Highway
- Continued income to Village from mooring rentals



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along Concourse East and West as well as the adjoining section of Montauk Highway. This Proposed Project will also continue to allow the Village of Brightwaters to collect mooring fees for the berthing of boats along the Canals bulkheads.

This project will require an engineering design component which will include an inventory of the condition of Village-owned bulkheads along the canal, identification of locations most in need of rehabilitation, and appropriate designs to repair or replace those bulkheads. Decisions on which bulkheads will receive repairs or replacement will be based on the locations most in need of improvement and the availability of funding. This project proposes the replacement and/or upgrading of up to 1,500 feet of bulkhead. The improvement is proposed to occur in three (3) 500-linear foot phases. The order of implementation of the phases would be based on engineering input from the Village's Highway Department which is currently responsible for maintaining the existing bulkhead.

Estimated Project Cost

The approximate conceptual cost for the total project is estimated to be \$1,354,000. This total includes \$134,000 for design, permitting and construction management, and \$338,500 in contingencies. Including design, permitting, and construction management as well as contingencies, each of the three phases related to the implementation of this project is estimated to cost \$677,000. The estimated operations and maintenance costs associated with this project is \$5,000 per year. Assuming an average useful life of 30 years for these improvements, this project has a conceptual life cycle cost of \$1,504,000.

Project Benefits

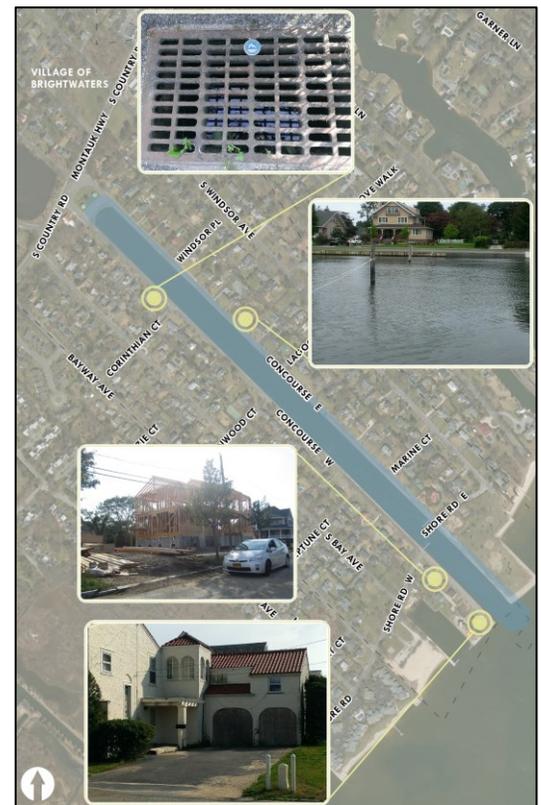
Risk Reduction and Resiliency

Improving the public bulkhead system along the Brightwaters Canal will increase the resiliency of the adjoining residential neighborhoods and roads south of Montauk Highway. This project reduces the risk for assets in these areas by improving shore defenses, thereby reducing exposure to flooding and flood-related impacts. The bulkheads themselves will be made more resilient; therefore, they will be at less risk for damage from future storms. Montauk Highway, which is immediately north of the Canal, is a major regional roadway that serves as the primary east-west connector along Suffolk's South Shore. This road provides access to local residential streets, businesses as well as two nearby medical



Undermined bulkhead, Brightwaters Canal

Source: Jacobs



Areas along the Brightwaters Canal suffer from recurring flooding and poor drainage, especially since Superstorm Sandy.



Greater Bay Shore NY Rising Community Reconstruction Plan

facilities: LIJ Southside Hospital and Good Samaritan Hospital. The implementation of this Proposed Project will limit flooding from the overtopping of the Canal on the roadway and increase its resiliency. About 60 existing homes line Concourse East and West streets which directly front the Canal. These 60 homes would be made more resilient through a decreased risk of flooding and/or damage due to wave action. Emergency access to these residences during flood events would also be improved. Finally, a Suffolk County Southwest Sewer District pump station is located on Shore Road adjoining the Canal. Improvements to the bulkheads in the adjoining area would make this facility more resilient.

In all likelihood, this Proposed Project would not completely stop flooding in the event of another major natural disaster or storm event similar to Superstorm Sandy. However, this project would help to decrease the vulnerability and exposure of the residential homes proximate to the Brightwaters Canal due to improvements in the physical resiliency of the waterway.

Economic Benefits

The implementation of this project could potentially create temporary jobs for a minimum of one year. An estimated 17 Full Time Equivalent (FTE) jobs would be created during that period.⁷¹

Permanent Village jobs associated with the maintenance of the Canal and its bulkhead that existed prior to and after Superstorm Sandy will be retained with these improvements. The Brightwaters Canal Resiliency Improvements will address the Long Island REDC goal: Investments in Rebuilding LI “Smartly” from The Strategic Economic Development Plan for Nassau and Suffolk Counties (2013 Update) which includes this strategy: “Rebuild and expand infrastructure to improve job access, revitalize downtowns and transit hubs, speed trade, and attract and retain dynamic regional businesses and highly skilled workers.” The Canal Resiliency Improvements project will enhance the local economy by preserving real estate values. Rehabilitating the bulkhead systems will diminish negative impacts on property value that might result from frequent flooding. The Waterfront Resiliency Improvements will reduce future storm-related emergency and recovery costs by reducing the frequency and location of flooding. These improvements will reduce the costs of personal property damage for homeowners from flooding events. These improvements could also reduce damage to private vehicles in driveways along the Canal as a result of flooding. Restoration of the bulkhead system will allow the Village of



Flooding along Concourse West.
Source: Greater Bay Shore NYRCR
Planning Committee



Greater Bay Shore NY Rising Community Reconstruction Plan

Brightwaters to continue to lease the entire allotment of moorings to boat owners, providing a key component of the Village's operating revenue.

Health and Social Benefits

This Waterfront Resiliency Improvement Project will decrease the severity of roadway flooding therefore maintaining transportation access to health and medical facilities for affected residents. The elimination of ponding, which can breed mosquitoes, is a positive health benefit from reducing flooding. Decreasing and/or eliminating flooding will improve the overall quality of life in the Community which will be a positive social benefit

Cost Benefit Analysis

Project cost: \$1,354,000

Life-cycle cost: \$1,504,000

Recurring costs: Though recurring costs are captured in the life-cycle cost, it should be noted that operation and maintenance costs will be the responsibility of the implementing entity or other project partner.

External costs: Construction and repair of bulkheads could inconvenience businesses and local residents. There will be potential wage and revenue losses during construction to the Village due to the temporary displacement of moorings along the canal wall.

Groups impacted: Residential neighborhoods and roads south of Montauk Highway will be less exposed to floodwater. There will be decreased risk to 60 homes along Concourse East and West, the Southwest Sewer District pump station, and the adjoining section of Montauk Highway, which provides access to local residential streets, businesses, LIJ Southside Hospital, and Good Samaritan Hospital. This project would mainly impact the Village of Brightwaters, and neighborhoods and roads that are adjacent to the canal. Risk would be reduced for assets in extreme and high hazard areas.

Savings: To the extent that erosion and damage to bulkheads worsens, it is beneficial to address problems as early as possible when they will likely cost less to address. Additionally, with reduced flooding, there will be reduced emergency and recovery costs.



Residential property damage along Concourse West.

Source: Greater Bay Shore NYRCR Planning Committee



Opportunity cost: Without this project, erosion and damage to bulkheads could continue. There will be missed opportunity to preserve real estate values and to reduce damage to vehicles. Flooding of Montauk Highway and adjacent streets would hinder the provision of services and emergency access. Also, Brightwaters could lose moorings that it leases, which is a key component of its operating revenue.

Risk Reduction Analysis

Well-designed, raised bulkheading would help to improve the physical and economic resiliency of the Community. This project will increase the resiliency of neighborhoods and roadways that are adjacent to the Canal, especially Concourse East and West. The project reduces risk for assets in the Severe and High classifications, especially those located south of Main Street/Montauk Highway by reducing exposure to flooding and flood-related impacts.

General Timeframe for Implementation

It is estimated that, from the time implementation begins, this Proposed Project has potential for mid-term implementation (12 to 18 months). An engineering evaluation will identify locations in need of improvement and to develop plans for improvement (3 months). Engineering plans will be submitted to regulatory agencies for review and permit approval (6 months). Upon receiving regulatory and permit approvals, bid documents will be prepared and contractor(s) to conduct the work will be selected (3 months). The project will be constructed per the contractor schedule submitting during the bidding process; construction is anticipated to take between 3 to 6 months, depending on the project design, time of year, weather, or other variable factors.

Regulatory Requirements Related to Project

Potential challenges are moderate in scope. This project would likely require close coordination between the Village of Brightwaters, the New York State Department of Environmental Conservation (NYS DEC), New York State Department of State (NYS DOS) and possibly the U.S. Army Corps of Engineers (USACE).

Tidal Wetlands, Protection of Waters and Water Quality Certification approval would be needed from the NYS DEC for bulkhead reconstruction and/or modification.



Greater Bay Shore NY Rising Community Reconstruction Plan

A NYS DOS Coastal Zone Management (CZM) consistency review could be required in areas of the Village that lie within the State's Coastal Zone boundary. Additionally, review and coordination as well as the necessary extensive environmental permitting would be required with NYS DEC.

Jurisdiction

Village of Brightwaters.



FEATURED PROJECT: **DRAINAGE, ROADWAY & UTILITY INFRASTRUCTURE DESIGN INITIATIVE**

Project Description

This initiative would undertake the design, hydrologic study and engineering of the five locations identified below. This Featured Project would further investigate the specific cause of the flooding and the development of concept designs and actions for implementation. Recommendations could include the upgrading and installation of new drainage catch basins, drainage pipe, check valves at outlets and road raisings. Where applicable, “Green” infrastructure will be incorporated into final design recommendations. These investigations would focus on the following areas:

- Main Street from South Saxon Avenue to Homan Avenue
- Lawrence Lane south of Montauk Highway
- Concourse East and West in the Village of Brightwaters
- South Court between Awixa Avenue and South Penataquit Avenue
- Inlet View

Background

Currently, a number of locations within Greater Bay Shore are prone to frequent flooding. By all indications this has been exacerbated by Superstorm Sandy. These locations either have damaged or inadequate storm drainage facilities. The volume of water and debris associated with the storm overwhelmed and impacted the drainage system to the point that it no longer serves to efficiently drain roadways and adjacent properties during regular rainfall events or prevent the canals and bay from back-flowing through the system. Catch basins were silted in and damaged; pipes fractured, causing water to undermine bulkheads instead of draining into outfalls.

Localized flooding also impacts transportation and access along crucial roadways within the Community. The opportunity to raise roads in select locations can alleviate flooding or at least extend the period that the roadway would be passable during a storm event.

Currently, significant areas along and south of Montauk Highway experience localized flooding as a result of these inadequacies.

DRAINAGE, ROADWAY & UTILITY INFRASTRUCTURE DESIGN INITIATIVE



Location

- Main Street from South Saxon Avenue to Homan Avenue
- Lawrence Lane south of Montauk Highway
- Concourse East & West (Brightwaters)
- South Court between Awixa Avenue & South Penataquit Avenue
- Inlet View

Cost

- \$1,375,000

Needs

- Minimize localized flooding on roadways
- Unimpeded access along evacuation routes and to

Assets Made More Resilient

- Residential Properties south of Montauk Highway
- Businesses south of Montauk Highway
- LIJ Southside Hospital
- Sanitary Sewer Pump Station

Risk Reduction & Benefits

- Reduced roadway flooding
- Improved access to Hospital
- Improved access by first responders
- Improved emergency evacuation opportunities



Greater Bay Shore NY Rising Community Reconstruction Plan

Homes and vehicles suffer damage and access for residents, businesses and emergency services is compromised.

The project has a high-level of feasibility, as this type of project is standard and implemented on a regular basis in communities across Long Island and other areas. Potential challenges are limited in scope. Improvements relate to repairing damage resulting from Superstorm Sandy and resiliency improvements to limit future storm damage. While the project would not eliminate all flood risks, it would reduce risk, especially for moderate level storm events. Extreme storm events would still present flood risks as was evidenced with Superstorm Sandy.

Estimated Project Cost

The approximate conceptual costs for this project (final design) are estimated to be \$1,375,000 which includes:

- Main Street from South Saxon Avenue to Homan Avenue: \$580,000
- Lawrence Lane south of Montauk Highway: \$110,000
- Concourse East and West in the Village of Brightwaters: \$110,000
- South Court between Awixa Avenue and South Penataquit: \$180,000
- Inlet View: \$100,000

Included in the total is \$275,000 in contingencies. As this Featured Project involves the development of design documents, no operations and maintenance costs or lifecycle costs are assumed.

Project Benefits

Risk Reduction and Resiliency

Although the Featured Project is a design initiative, the eventual implementation of the project, will reduce the incidence of flooding for critical access routes in the Community. These areas are flooded on a frequent basis due to storm events, related high tide flooding, and inadequate storm drainage systems (often rendered ineffective due to high groundwater conditions). The proposed locations are subject to tidal inundation due to the high exposure to storms caused by the low elevation topography of the area and inadequacy of the existing drainage systems.



Greater Bay Shore NY Rising Community Reconstruction Plan

Potential projects, such as the raising of roads, upgrading of the subsurface drainage infrastructure, installation of check valves at outlets, and installation of stormwater best management practices would reduce risk to residents by minimizing repetitive flooding issues. Specific benefits that would result from the eventual implementation of these designs, are described below.

Enhancements along Main Street between Homan Avenue and South Saxon Avenue would provide benefit to the businesses along this corridor. This area of the Community continues to redevelop as a medical corridor. LIJ Southside Hospital as well as a number of medical and support offices are located in the vicinity. During Superstorm Sandy, access to these facilities was severely compromised due to flooding. Improvements to this roadway would assure access during times of emergency and allow the healthcare uses along this corridor to continue to expand. This corridor also contains multi-family housing which will be afforded better access during flooding events.

Lawrence Lane, south of Montauk Highway, is lined with single-family, residential homes. The approximately 40 homes fronting Lawrence Lane suffered flooding and compromised access as a result of Superstorm Sandy. This project would benefit each residence in this location through reduced flooding and better access along the road. Access would be upgraded and would benefit the residents through quicker service by first responders as well as improved opportunities for self-evacuation during severe weather.

Concourse East and West front the two sides of Brightwaters Canal. During Superstorm Sandy both roadways were inundated and the existing drainage system failed to function properly which limited access to adjoining neighborhoods. The 60 homes along these parallel roadways suffered flooding. Upgrades to these roadways would reduce the risk of flooding and allow better access during severe weather. Enhanced access would benefit residents through more efficient emergency response by first responders as well as improved opportunities for self-evacuation during severe weather.



Greater Bay Shore NY Rising Community Reconstruction Plan



Sample rendering of drainage and “Green” infrastructure improvements on Lawrence Lane.
Source: KS Engineers, PC

Additionally, a Southwest Sewer District Sanitary Pump Station is located at the foot of Concourse East and Shore Road East. The pump station was also inundated during Superstorm Sandy. Residents in the Village of Brightwaters suffered backups of their sanitary system both in their homes as well as on adjoining streets as a result of the flooding. Improvements to Concourse East would allow for better access to this facility during times of severe weather allowing benefits to the residents throughout the Planning Area in terms of access to the facility to undertake emergency maintenance or back flow prevention. The hardening of this facility with a flood barrier would also prevent overflow from the sanitary system and associated damage.

South Court between Awixa Avenue and South Penataquit Avenue is a residential street with nine homes along the north side of the roadway. The south side of the roadway is bordered by a canal that connects the Penataquit and Awixa Creeks. This roadway and the adjoining homes were completely inundated during Superstorm Sandy. The roadway is frequently flooded and property damage is common. Improvements to this roadway’s drainage system and/or raising the roadway would provide benefit to the nine residences along its length in regard to the maintenance of access during periods of severe weather. This would also improve first responder access by first responders to the area.



Inlet View is a short roadway located along the west side of Orowoc Creek. Eight homes and a small marina are located adjacent to this road. The road and the adjoining homes suffered severe flooding as a result of Superstorm Sandy. Enhancements to the roadway drainage and/or raising the roadway would allow for better access during severe weather events. Given this roadway's location, these improvements would not prevent a future calamity similar to Superstorm Sandy but they would provide opportunities to maintain access during the frequent nor'easters and high tides that have worsened since sandy. This project would also benefit the residents in terms of improving access for first responders during these same weather events.

Economic Benefits

The implementation of this project could potentially create temporary jobs for a minimum of one year. Based on industry standards an estimated 34 Full Time Equivalent (FTE) jobs would be created during that period.⁷² Permanent stormwater protection maintenance jobs that existed prior to and after Superstorm Sandy would be retained. In addition, permanent jobs associated with the local marine economy would also be maintained as drainage improvements would reduce the likelihood of businesses relocating or temporarily closing due to recurring flooding. This project would also help reduce risk to these local waterfront assets such as the ferry terminals, marinas, restaurants and other waterfront-enhanced businesses, housing south of Montauk Highway and a sanitary sewer pump station in the Village of Brightwaters. As such, the project would help to make the local economy more resilient on the whole. The resiliency improvements associated with this project would reduce storm-related emergency and recovery costs for local businesses. Other benefits include a reduction in days lost at work due to storm damage and costs associated with repair or replacement of flooded vehicles.

This project would address the Long Island Regional Economic Development Council (LIREDC) goal, *Investments in Rebuilding LI "Smartly"*, which includes this strategy: "Rebuild and expand infrastructure to improve job access, revitalize downtowns and transit hubs, speed trade, and attract and retain dynamic regional businesses and highly skilled workers." Additionally, this project would alleviate flood damage repairs that residents in high and extreme risk areas would otherwise have to repeatedly undertake without the project in place. This project would also help to make



real estate south of Montauk Highway more desirable and less flood-prone, thereby stabilizing tax ratables within the Community.

Environmental Benefits

Enhancements and capacity upgrades to the storm water drainage system could be critically important to the ecological health of the Great South Bay. The incorporation of oil/water separators, and other measures that reduce the conveyance of sediments and floatables, would result in improved water quality. County-wide water quality concerns include non-point source pollution and storm water runoff which have the potential to seep into ground water and impact surface water bodies such as the Great South Bay. This Featured Project would be consistent with the County's stormwater management practices as outlined in *Managing Stormwater - Natural Vegetation and Green Methodologies*. This project would also comply with Suffolk County's *Comprehensive Water Resources Management Plan* which prioritizes the evaluation of additional sewers and other structural measures in an effort to help protect groundwater resources and address potential future development

Health and Social Benefits

Accessibility to these areas during times of flooding would be enhanced along roadways for residents as well as emergency personnel. As a result, the project would reduce the vulnerability of all residents in the immediate area of these upgrades from being stranded or being able to reach a critical facility. A potentially significant benefit would be in the area along Main Street in the vicinity of LIJ Southside Hospital. Flooding from Superstorm Sandy as well as several subsequent weather events has resulted in compromised access to the hospital along Main Street. These improvements would help to alleviate that situation affording hospital users better access. The occurrence of standing water and the high water level in catch basins would reduce potential mosquito breeding areas. The flooding created from the current situation creates unsanitary conditions for both the natural and built environment that would be improved with the storm sewer project elements.



Cost Benefit Analysis

Project cost: \$1,375,000

Life-cycle cost: \$1,375,000

Recurring costs: Though recurring costs are captured in the life-cycle costs, it should be noted that operations and maintenance costs will be the responsibility of the implementing entity or other project partner.

External costs: External costs of implementing the project include the time taken to perform road raising; road service interruption; and effects on traffic, travel time, and access.

Groups impacted: While there are no direct benefits from a study, the benefits of implementation could be numerous. Flooding would be reduced on major thoroughfares; leading to less impeded traffic and reduced risk. A number of resources would experience reduced flooding. Key assets that could be secured through project implementation include 117 single-family residences as well as multi-family housing and businesses south of Montauk Highway, the LIJ Southside Hospital, a sanitary sewer pump station, ferry terminals, marinas, restaurants, and waterfront-enhanced businesses. Particular assets affected are as follows:

- **Main Street, between Homan Avenue and South Saxon Avenue:** businesses along corridor (including medical corridor); LIJ Southside Hospital; multi-family housing
- **Lawrence Lane south of Montauk Highway:** 40 homes and six businesses
- **Concourse East and West:** 60 homes, five businesses, sanitary pump station
- **South Court between Awixa Avenue and South Penataquit Avenue:** nine homes
- **Inlet View:** eight homes and a small marina

Savings: While there are no direct savings from a study, implementation of the study's suggestions could reduce property damage and recovery costs if flooding is reduced.

Opportunity cost: If this project is not implemented, in a worst-case scenario, 20,000 to 23,000 vehicles per day could lose access to the main thoroughfare during the storm.⁷³ If this project is not undertaken, opportunity costs include extensive, repetitive damage due to flooding, economic loss due to inability to work, and



hindrance in provision of services due to lack of access. The opportunity costs of not executing this project are high. As infrastructure becomes less resilient and capable after large storms, flooding as well as recovery measures will continue to increase. Property values in flood-prone areas could decline.

Risk Reduction Analysis

The raising of road elevations and improvements to drainage infrastructure would reduce flooding for the areas identified as most vulnerable to storm events. The Committee has preliminarily identified several locations in the Community that have roads that should be evaluated for road raising. These areas include the Montauk Highway/Main Street commercial district and frequently impacted roadways, such as Lawrence Lane, South Court, and Inlet View. The vulnerability of residential housing assets will be reduced, as there is an increased capacity for residents to leave and return to their homes safely and quickly in an emergency situation due to decreased flooding on roadways. Additionally, assets such as LIJ Southside Hospital will be made more resilient as a result of improved access during severe storm events.

General Timeframe for Implementation

It is estimated that from the time implementation begins, this Featured Project has two primary implementation phases. The first phase, the study, could occur in the short term (0 to 12 months). Upon the completion of the study, the actual improvements could be implemented in a mid-term time frame of approximately 24 months. This would include: 6 months for the design of the improvements, 3 months for procurement and bidding, 3 months for permitting and approximately 12 months for construction.

Regulatory Requirements Related to Project

Regulatory review of this project would likely include State and/or County agencies depending on ownership of the roadways where stormwater infrastructure is located or needed. A Coastal Zone Management (CZM) consistency review (by the New York State Department of State) would be required in areas of the community that lie within the State's Coastal Zone boundary. Additionally, review and coordination as well as the necessary environmental permitting would be required with New York State Department of Environmental Conservation (NYS DEC) in areas proximate to fresh and tidal wetlands and the waterfront.



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Most activities to be identified and recommended in this project (road raising, drainage improvements, etc.) will require NYS DEC approval under Tidal Wetlands, Freshwater Wetlands, Water Quality Certification or State Pollutant Discharge Elimination System programs.

Additional coordination and review with appropriate utilities such as PSEG/National Grid and others would also be necessary. No real property or other significant constraints have been identified to date for this project that enjoys public support.

Jurisdiction

Town of Islip and Village of Brightwaters; Suffolk County Department of Public Works; New York State Department of Transportation; New York State Department of Environmental Conservation.



FEATURED PROJECT: **STREAM CORRIDOR & LAKES DRAINAGE CAPACITY IMPROVEMENT IMPLEMENTATION**

Project Description

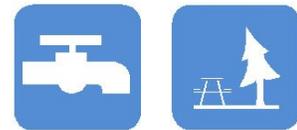
This Featured Project would implement recommendations from the *Stream Corridor & Lakes Drainage Capacity Improvement Initiative* (a Proposed Project identified earlier in this report). This earlier Proposed Project will identify and design improvements that could be implemented in a phased manner to each of the six streams. This Featured Project involves the implementation of improvements to the six streams located within Greater Bay Shore for the purpose of enhancing their stormwater storage and conveyance capacities. Improvements could include: the cleaning and grubbing of the streams and its adjacent riparian area; tree trimming and removal; selected dredging of the stream bed in areas where silting has severely restricted stream flow; the cleaning and or replacement of culverts where appropriate; the placement of rip rap; the expansion or creation of areas for storm water detention; replanting in appropriate locations with native and resilient species and or other appropriate design improvements. The six streams include:

- Trues Creek
- Lawrence Creek
- Watchogue Creek
- Penataquit Creek
- Awixa Creek
- Orowoc Creek

Background

The six streams, traveling from the north, wind their way through the Community in various states of natural and man-made conditions. Orowoc Creek, Awixa Creek, Penataquit Creek, Watchogue Creek and Lawrence Creek as well as Trues Creek act as a storm drainage way, a refuge for wildlife and as some of the few remaining unbuilt areas of the community. Over hundreds of years of habitation these streams have been greatly affected by human development. Floodplains related to the streams have been developed with impervious surfaces, culverts have been installed beneath roadways and other built structures, and the streams themselves have been silted and blocked with man-made and

STREAM CORRIDOR & LAKES DRAINAGE CAPACITY IMPROVEMENT IMPLEMENTATION



Location

- Trues Creek
- Lawrence Creek
- Watchogue Creek
- Penataquit Creek
- Awixa Creek
- Orowoc Creek

Cost

- \$5,772,500

Needs

- To improve flood protection, stormwater retention, and water quality
- To repair and protect natural systems
- Improved resiliency of adjacent housing

Assets Made More Resilient

- Residences
- Businesses
- Community Facilities
- LIJ Southside Hospital
- Montauk Highway
- Residential housing in the vicinity of Brightwaters Lakes (over 50 residences)

Risk Reduction & Benefits

- Decreased vulnerability to flooding
- Reduced storm-related expenditures for local businesses, residences, and institutions
- Reduced personal property damage
- Improved emergency access



Greater Bay Shore NY Rising Community Reconstruction Plan

natural debris from Superstorm Sandy and other severe weather events.

During Superstorm Sandy these creeks reversed their normal north-south flow as a result of the Bay's severe inundation. These streams no longer effectively serve their function of conveyance and storage of stormwater. Since Superstorm Sandy, these creeks have overrun their banks, flooded streets, homes and businesses and continue to degrade in terms of their storm water drainage function.

Estimated Project Cost

The approximate total conceptual costs for this project are estimated to be \$5,772,500. Implementation costs for the specific creeks including contingency are as follows.

- Trues Creek: \$867,000
- Lawrence Creek: \$91,000
- Watchogue Creek: \$574,500
- Penataquit Creek: \$2,392,000
- Awixa Creek: \$508,000
- Orowoc Creek: \$1,340,000

The estimated operations and maintenance costs for these stream restoration improvements are approximately \$75,000 per year. Assuming an average 30 year useful life for these improvements, a conceptual life cycle cost of \$8,023,000 has been estimated.

Project Benefits

Risk Reduction and Resiliency

This Proposed Project involves the implementation of stream restoration improvements to the creeks located within the Greater Bay Shore Planning Area. These improvements would provide multiple Risk Reduction benefits including improved stormwater management and improved health of the natural environment when these recommendations are implemented. Residences, businesses and community facilities such as LIJ Southside Hospital, located adjacent to these creeks are situated in high-risk areas and experienced flooding as a result of Superstorm Sandy. Improvements that enhance the natural stormwater conveyance and storage capacity of these creeks could reduce the risk to adjacent assets by reducing the exposure of those assets to flooding and flood related damage. One of the main benefits of the project would be the increased ability of the creeks to store storm surge

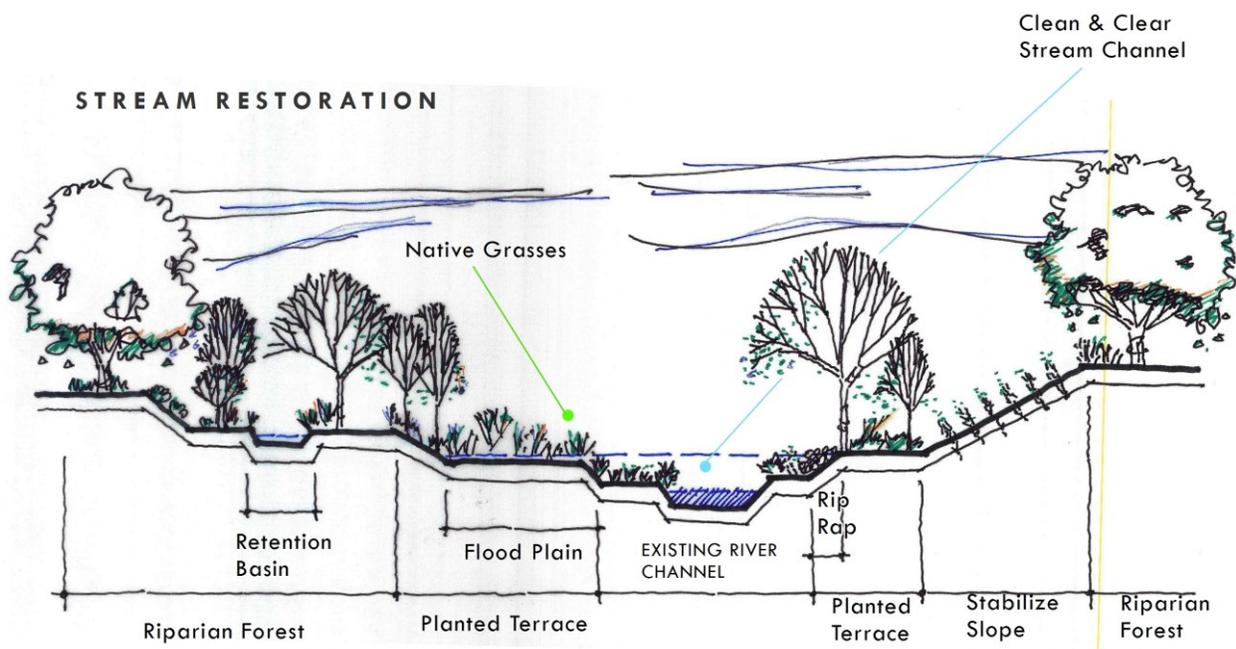


Sample of stream restoration and stream bank stabilization.

Source: Jacobs



water. The streams would function more naturally with the ability to channel stormwater runoff from upstream areas during rain events and accept the Bay's waters during tidal surge events. Improving the health and flow of local stream corridors also has the potential to improve the health of local wetlands. This project would also provide ancillary benefits to emergency providers and residents through the alleviation of flooding along crucial stretches of Montauk Highway. While the project would not eliminate all flood risks, it would reduce risk, especially during moderate level storm events.



Conceptual rendering of stream corridor restoration incorporating “Green” treatments.

Source: Jacobs

Economic Benefits

The implementation of this project could potentially create temporary jobs for up to three years. Based on industry standards and assuming improvements are implemented for all six stream corridors, an estimated 72 Full Time Equivalent (FTE) jobs would be created during that period.⁷⁴

The stream restoration improvements associated with this Featured Project would reduce storm-related emergency and recovery expenditures for local businesses and residences (i.e., personal property damages) in the vicinity of the creeks. These improvements would benefit LIJ Southside Hospital given its



location adjacent to the Penataquit Creek. The Hospital has experienced significant flooding during and after Superstorm Sandy. A recent flood event (since Superstorm Sandy) required more than \$3 million in repairs as a result of flooding from the stream.

Benefits would also include a reduction in days lost at work due to storm damage. Additionally, implementation of these recommendations could address potential negative impacts on property values by making adjacent neighborhoods more resilient to future storms which would have a positive impact on home values.

This project would be consistent with the two Long Island Regional Economic Development Council (LIREDC) goals. *Investments in Rebuilding LI “Smartly”* includes the strategy to “Rebuild and expand infrastructure to improve job access, revitalize downtowns and transit hubs, speed trade, and attract and retain dynamic regional businesses and highly skilled workers.” Additionally, the project is also consistent with the LIREDC’s key strategy, *Investments in Our Natural Assets*, related to promoting improved infrastructure such as wastewater treatment, storm water runoff mitigation with positive impacts on aquaculture, quality of life and tourism.⁷⁵

Environmental Benefits

The eventual restoration of these stream corridors, the enhancement of their ability to transport and detain storm water and the restoration of healthy and sustainable plant communities are critical to Greater Bay Shore’s resilient future. Project benefits would include local flood control while potentially improving water quality as well as providing habitat for wildlife and improved recreational space for the public. The potential water quality improvements would be consistent with the recommendations of the Long Island South Shore Estuary Reserve Comprehensive Management Plan.⁷⁶

Health and Social Benefits

This project could potentially help to alleviate flooding along portions of Montauk Highway especially in the immediate vicinity of the LIJ Southside Hospital. This would help to provide unimpeded access to the Hospital as well as accessibility to this and other areas within the community by the fire department, police, emergency medical services and utility repair crews who have been previously hampered by flooding. Creek drainage improvements, especially



Greater Bay Shore NY Rising Community Reconstruction Plan

along the Awixa Creek could also help alleviate flooding on the LIJ Southside Hospital property itself allowing the Hospital to provide uninterrupted service to the community.

Cost Benefit Analysis

Project cost: \$5,772,500

Life-cycle cost: \$8,023,000

Recurring costs: Though recurring costs are captured in the life-cycle costs, it should be noted that operations and maintenance costs will be the responsibility of the implementing entity or other project partner.

External costs: The implementation of stream restoration improvements could result in the short term inconvenience of nearby residents and businesses. These externalities could include activities related to construction in and around the waterways themselves and additional traffic related to construction on local roadways.

Groups impacted: The implementation of stream restoration improvements would result in a positive impact for residences, businesses, community facilities (such as LIJ Southside Hospital) and roadways such as Montauk Highway and Union Boulevard that are close to the streams. These improvements would benefit LIJ Southside Hospital (which has experienced significant flooding during and after Superstorm Sandy), given its location adjacent to the Penataquit Creek. In 2012, 122 businesses were identified within 200 feet of these streams. These businesses would experience reduced flooding from this project. Particular resources adjacent to streams are as follows:

- *Trues Creek*
 - Gardiner County Park, South Country School
- *Lawrence Creek*
 - St. Luke's Church, Sagtikos Manor
- *Watchogue Creek*
 - South Bay Marina, Storm Sewer Pump Station (Ocean Avenue Dock), Bay Shore Ferry Terminal, Storm Sewer Pump Station (Maple Avenue Dock), Maple Avenue Marina, Maple Avenue Dock, Ocean Avenue Dock, Gibson-Mack Holt House, Dr. George S. King Park, Community Reflection Garden, Shore Drugs, Bay Shore Marina (Town of



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Islip), Atria Bay Shore Senior Living, Montauk Highway/Main Street

- *Penataquit Creek*
 - Southside Mall, Brook Avenue Elementary School, Bay Shore Fire Station 2, Bay Shore-Brightwaters Rescue Ambulance, LIJ Southside Hospital, New York SMSA Cell Tower, South Shore Professional Plaza, Bay Shore Animal Hospital, Watchogue Creek Park, Homan Avenue Dock, Old Mill Pond, South Bay Marina, Storm Sewer Pump Station (Ocean Avenue Dock), Bay Shore Ferry Terminal, Storm Sewer Pump Station (Maple Avenue Dock), Maple Avenue Marina, Maple Avenue Dock, Ocean Avenue Dock
- *Awixa Creek*
 - LIJ Southside Outpatient Cancer/Oncology Center, Suffolk County DPW Sewage Pumping Facility, Montfort Seminary
- *Orowoc Creek*
 - LIJ Southside Outpatient Cancer/Oncology Center, Suffolk County DPW Sewage Pumping Facility, Montfort Seminary

Savings: To the extent that damage is getting worse, acting sooner rather than later would minimize costs. There would also be savings due to avoided repeated property damage that would otherwise occur.

Opportunity cost: These streams no longer function effectively, and flood streets, homes and businesses. Without this project, the streams will continue to degrade in terms of their storm water drainage function. If the streams were able to function properly, this could reduce work days lost and address potential negative impacts on property values. In a worst-case scenario, access to major hospitals would continue to be compromised.

Risk Reduction Analysis

This Featured Project would improve the health of the local network of streams by restoring the natural movement of water. A functioning stream network is crucial to maintaining the health of



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the Great Cove Watershed. The potential stream improvement projects would also reduce flood risk to:

- Residences;
- Commercial properties;
- Community facilities; and
- Public areas adjacent to streams.

Additionally, enhanced flooding protection from this project is expected to reduce the vulnerability of residential areas within extreme and high risk areas of the Village of Brightwaters. Additionally, this project is anticipated to improve the health and reduce vulnerability of the Brightwaters Lakes themselves

General Timeframe for Implementation

From the time that implementation begins, it is estimated that this project has potential for long-term implementation (more than 36 months). This assumes approximately 6 months for the bidding and selection of an engineering consultant, 12 to 15 months for the environmental permitting and approximately 24 to 36 months for the implementation of the improvements.

Regulatory Requirements Related to Project

Implementation of stream restoration improvements associated with this project will require extensive environmental permitting. Review, coordination and permitting would be required with the New York State Department of Environmental Conservation (NYS DEC) in areas proximate to wetlands and the waterfront. Activities such as debris removal, culvert improvements, floodplain restoration and drainage improvements will require NYS DEC approval under Freshwater Wetlands, Tidal Wetlands, Water Quality Certification or State Pollutant Discharge Elimination System programs. Each identified stream corridor contains regulated Freshwater and Tidal Wetlands.

Additionally, some of the identified stream corridors (Orowoc and Penataquit) still contain significant valuable riparian wetland areas which must be protected. As such, the NYS DEC Natural Heritage Program and other extant sources should be consulted for records of listed species of plants and animals inhabiting these systems. The Brightwaters Lakes system is a NYS DEC regulated Freshwater Wetland. Proposals to increase system capacity to drain stormwater, or modifications to the bed and banks will require Freshwater Wetlands, Protection of Waters and Water Quality



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Certification approval. Modification of the outlet structure may require Dam Safety approval.

This project may also involve the U.S. Army Corps of Engineers (USACE) and Coastal Zone Management (CZM) consistency concurrence (New York State Department of State). Community outreach and involvement of adjoining residential and business owners should also be undertaken as the project progresses during the planning and design stages.

Jurisdiction

Town of Islip, Suffolk County jurisdiction along Trues Creek (Gardiner County Park), and potential NYS DOT jurisdiction if work is conducted in Montauk Highway right-of-way and potential involvement of Home Owner Associations (e.g., the Admiralty in West Bay Shore) and New York State Department of Environmental Conservation.



FEATURED PROJECT: BAYVIEW AVENUE, BAY SHORE WATERFRONT CORRIDOR IMPROVEMENTS

Project Description

This Featured Project is to design and build “Complete Streets” improvements including sidewalks, landscaping, lighting and drainage. “Green” infrastructure technology and permeable pavement could be incorporated in order to better define this corridor physically and improve its function as a transportation, and evacuation route. Currently, there are several vacant and underutilized lots in the area. This project would also evaluate the potential improvement and re-use of these parcels to build natural shoreline, or for parking and recreational opportunities in a manner that utilizes “Green” technology such as permeable pavement and rain gardens.

Background

Bayview Avenue between Ocean Avenue and South Clinton Avenue is a “connector” corridor that links the Bay Shore Marina Park with the Ocean Avenue Dock. Several restaurants, public and private marinas, boat yards and ship stores line this street, which is narrow with no defined pedestrian walkways. The ability to travel along the waterfront from one use to another along this road is potentially unsafe. This roadway has little or no drainage infrastructure and frequently floods. A number of businesses and homes along this roadway were severely flooded during Superstorm Sandy.

While this area is important from an economic and tourism perspective regarding its physical connections and waterfront circulation function, this corridor also provides crucial parallel access along the waterfront, connecting north-south roadways that would play a key role during waterfront evacuations. As such, this project would improve access and offer the choice of multiple and improved evacuation opportunities.

Estimated Project Cost

The approximate conceptual costs for this project are estimated to be \$1,300,000. This total includes \$900,000 for the implementation of the improvements, approximately \$170,000 for design, permitting and construction management, and \$230,000 in contingencies. The estimated operations and maintenance costs associated with this project is \$5,000 per year. Assuming an average

BAYVIEW AVENUE, BAY SHORE WATERFRONT CORRIDOR IMPROVEMENTS



Location

- Bayview Avenue
- LMI neighborhood in areas of Auburn Avenue is located immediately north

Cost

- \$1,300,000

Needs

- Improved resiliency and continuity of waterfront businesses
- Improved ability to circulate in waterfront area
- Unimpeded access to evacuation routes
- Coastal management planning

Assets Made More Resilient

- Waterfront businesses including restaurants, and commercial marinas
- Recreational resources
- Local roadways
- Adjacent residences
- Docks and Marinas

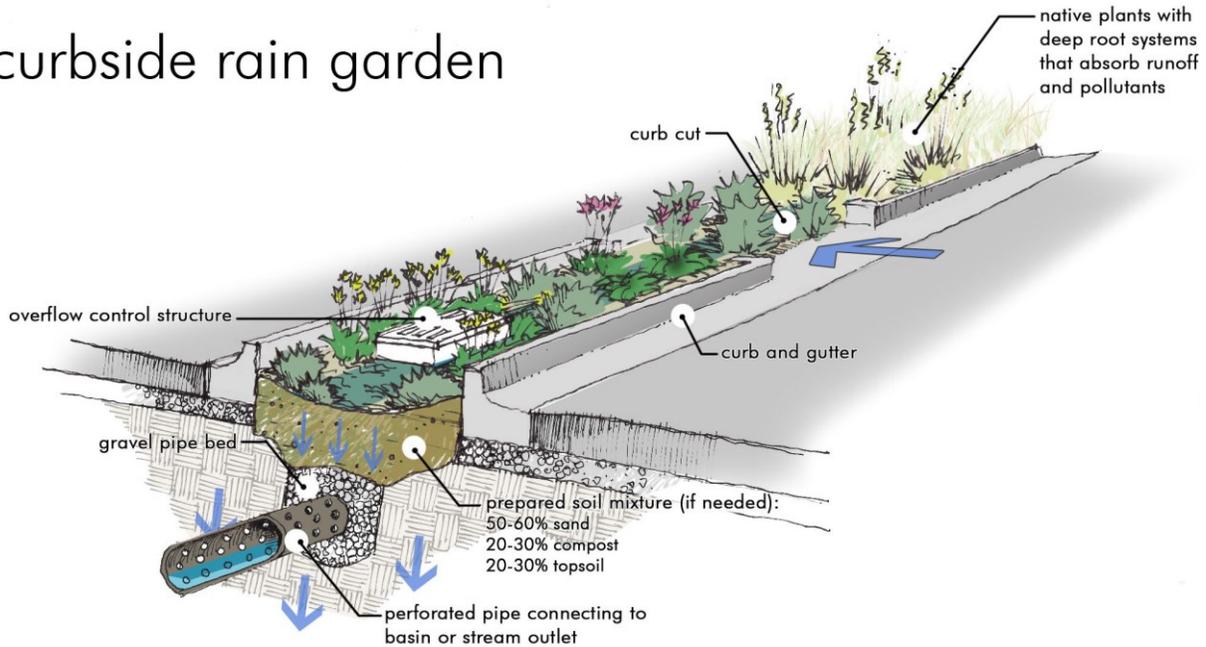
Risk Reduction & Benefits

- Improved parallel access and connectivity along the waterfront
- Improved ability to evacuate the waterfront
- Improved first responder access
- Improved safety for pedestrians and bicyclists
- Improved water quality
- Improved connections between and access to waterfront businesses



useful life of 30 years for these improvements, this project has a conceptual life cycle cost of \$1,450,000.

curbside rain garden



Sample rendering of a curbside rain garden.
Source: KS Engineers, PC

Project Benefits

Risk Reduction and Resiliency

This corridor improvement project would help to bolster Greater Bay Shore's local waterfront business community and strengthen the economic resilience of the area. This project would assist in achieving direct risk reduction for the businesses located in extreme and high risk areas adjoining the roadway. These businesses include: Captain Bill's Restaurant, Burnett's Marina, Swept Away (known before Superstorm Sandy as the Cool Water Grill), Nicky's on the Bay and Fatfish. This roadway also provides direct access to Bay Shore Manor Park located at the Bay Shore Marina. This public facility provides parking, recreational space, and dockage for nearly 400 boats along its bulkhead.

During Superstorm Sandy, this area was at an elevated risk because the existing storm sewer system was inadequate and permitted storm surge water to inundate the street and flood adjacent businesses. These businesses would be better able to resist damage from hazards and experience less time out of service after a storm



with this Featured Project in place. In all likelihood, this project would not stop flooding in another major natural disaster or storm event similar to Superstorm Sandy; however, the project would generally reduce the vulnerability of businesses to flooding that occurs through the storm drainage system.

Implementation of this Featured Project would result in improved access and connectivity between Bay Shore’s primary marinas. In addition, to the benefits to commercial marine and recreational uses, this Featured Project could potentially help to improve the resiliency of the Auburn Avenue low-moderate neighborhood to the immediate north of Bayview Avenue (by reducing flooding).

Drainage along the road would be collected so as to reduce the amount and duration of flooding and improve water quality. As a result, adjoining properties would be able to recover more rapidly after a major weather event (i.e., severe high tides, nor’easters, 100-year storm or combinations of these events). Vehicular and pedestrian safety would also be improved through the implementation of a complete streets policy. Businesses such as restaurants and water dependant uses such as marinas and boat repair shops along this 1,000-foot corridor would have reduced risk of flooding as a result of drainage enhancements. These uses would also benefit from the improved access afforded to vehicles, pedestrian and bicycles that could access their facilities along this roadway in a safe manner and travel between the various uses as well.

Economic Benefits

This portion of Bayview Avenue is the primary parallel roadway along the Bay Shore waterfront, connecting the Bay Shore Marina to the Ocean Avenue Dock. The roadway and surrounding land uses were inundated during Superstorm Sandy, limiting access to the restaurants, marinas, and recreational resources along this road. Reimagining this roadway as a “Complete Street” with a raised profile, drainage upgrades, safe and demarked areas for pedestrians and bicycles would benefit the overall economy of the marina area in addition to increasing first responder access. The three restaurants nearby this corridor (Fat Fish, Swept Away and Captain Bill’s) would all benefit from the improved roadway. Patrons could safely walk from one location to the next as opposed to the current situation with no shoulder or dedicated pedestrian/bicycle way. This project would in effect knit the disparate uses of this area into a unified district, creating a joint identity and brand. A number of



Figure 10. Waterfront Uses Along Bayview Avenue.

Source: Jacobs



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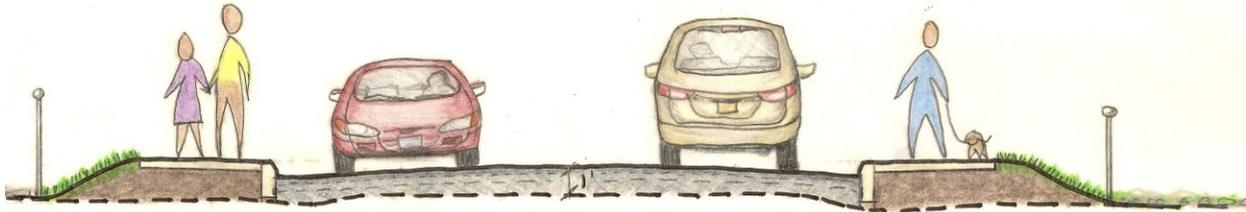
properties along the north side of the roadway are vacant and underutilized. The proposed improvements could result in elevated property values increasing inducement to develop housing or new businesses. As such, this Featured Project would further improve the economic resiliency of Greater Bay Shore through increased tax ratables (larger number of entities paying taxes).

Design and construction associated with this resiliency corridor project will add temporary jobs for up to 16 months. An estimated 16.25 Full-Time Equivalent (FTE) jobs will be created during that period.⁷⁷

This project is consistent with the LIREDC's key strategy, *Investments in Our Natural Assets*, related to promoting infrastructure such as wastewater treatment, storm water runoff mitigation with positive impacts on aquaculture, quality of life and tourism.⁷⁸

Environmental Benefits

Upgrades to Bayview Avenue would result in improved water quality through the addition of oil/water separators and enhanced storm water detention. The improvement to water quality would also be consistent with the recommendations of the Long Island South Shore Estuary Reserve Comprehensive Management Plan. The plan recommended the reduction of nonpoint sources of water pollution in order to enhance water quality. Construction of stormwater abatement projects in significant nonpoint source contributing areas associated with closed shellfish beds, impaired living resources, and bathing beaches that experience periodic closures due to water quality concerns was recommended in the plan.⁷⁹



Rendering of Bayview Avenue with the project in place.
Source: KS Engineers, PC

Health and Social Benefits

Accessibility to this area during times of flooding would be enhanced including access by the fire department, police, emergency medical services and utility repair crews who have been previously hampered by flooding. As a result, the project would reduce the vulnerability of the businesses and residents in the general area including vulnerable populations such as the elderly and individuals with disabilities. The occurrence of standing water and the high water level in catch basins would reduce or ameliorate potential mosquito breeding areas. The flooding created from the current situation creates unsanitary conditions for both the natural and built environment.

Cost Benefit Analysis

Project cost: \$1,300,000

Life-cycle cost: \$1,450,000

Recurring costs: Though recurring costs are captured in the life-cycle costs, it should be noted that operations and maintenance costs will be the responsibility of the implementing entity or other project partner.

External costs: Construction of street amenities could inconvenience businesses and local residents. There will be potential wage and revenue losses during construction.

Groups impacted: This project would provide risk reduction for businesses located in extreme- and high-risk areas nearby Bayview Avenue, including Captain Bill's Restaurant, Burnett's Marina, Swept Away, Nicky's on the Bay, and Fatfish (located to the east of



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Bayview Avenue). Additionally, the five houses on Bayview Avenue would benefit from this project, as would vulnerable populations and those who would benefit from safer pedestrian access. The Auburn Avenue low-moderate neighborhood could potentially benefit from improved resiliency. This project would also assist those needing access to dockage (nearly 400 boats) and South Bay Marina (92 spaces with storage space for at least 100 more).

Savings: A reduction in flooding would cause less damage to public and private property, resulting in lower emergency municipal expenditures and reduced recovery costs for business and homeowners.

Opportunity cost: If this project was not implemented, there could be economic loss due to lack of access (inability for employees to reach jobs and customers to reach businesses), as well as hindrance in provision of emergency services. Vacant and underutilized parcels in the area could be put to a better use, as there is currently a loss of tax revenue associated with these parcels. Continued poor water quality would negatively impact marine habitat in the area. Also, bathing beaches that are closed due to poor water quality will result in lost recreational opportunity.

Risk Reduction Analysis

This Featured Project is anticipated to reduce the risk and frequency of storm damage to key waterfront locations including:

- Residential housing in Extreme risk area of Bay Shore (portions of Ocean Avenue; Burnett Avenue, Auburn Avenue, and S. Clinton Avenue); and
- Waterfront commercial properties in Bay Shore (Captain Bill's Restaurant, Burnett's Marina-Bait and Tackle, Swept Away, Fatfish, By the Bay Pizzeria).

This project would reduce the risk of post-disaster disruptions to business operations and help to maintain access during storm events. The proposed improvements would also help to address ongoing stormwater drainage issues which continue to plague the area. Additionally, the potential re-use of vacant or underutilized parcels will reduce the number of structures in harm's way in future storm events, as well as introduce bioswales suitable for stormwater retention and recharge.



General Timeframe for Implementation

This Featured Project, from the time that implementation begins, could be undertaken in an intermediate term timeframe. Design for the improvements could be prepared in 4 months, permitting and approvals could be achieved in approximately 6 months and construction could be completed in 6 months depending on the time of year.

Regulatory Requirements Related to Project

Requirements related to regulatory review of this project would likely involve the Town of Islip. A Coastal Zone Management (CZM) consistency review (by the New York State Department of State) would be required in areas that lie within the State's Coastal Zone boundary. Additionally, review and coordination as well as the necessary environmental permitting would be required with New York State Department of Environmental Conservation (NYS DEC) in areas proximate to wetlands and the waterfront. More specifically, drainage improvements which will increase the volume of stormwater discharging to surface waters or constructing new surface water discharges will require NYS DEC Tidal Wetlands and Water Quality Certification approvals. Additional coordination and review with appropriate utilities such as PSEG/National Grid and others would also be necessary. No real property or other significant constraints have been identified to date for this project that enjoys public support.

Jurisdiction

Town of Islip and New York State Department of Environmental Conservation.



FEATURED PROJECT: **GREAT COVE WATERSHED IMPROVEMENT PROJECT**

Project Description

Within Greater Bay Shore, ten projects were recommended in Great Cove Watershed Management Plan (GCWMP) which was adopted by the Town of Islip in 2012. The projects involve the construction of such items as bio-retention basins, improvements to and installation of stormwater discharge treatment structures, and increased use of permeable paving materials and vegetated natural areas. Most of the projects are proposed at locations owned by the Town of Islip. Other sites are owned by the New York State Department of Transportation, the Town of Islip Housing Authority and a private entity. It should be noted that projects located on private property are likely not eligible for NYRCR Program funding. Based on a review of these projects and their potential for contributing to the Community's overall resiliency, four of the ten projects have been included within the "Featured Project" category. The remaining projects within the Greater Bay Shore Planning Area have been incorporated within the Additional Resiliency Recommendations portion of this report. The projects are described in the GCWMP as follows:⁸⁰

- **Montauk Highway at Lawrence Creek:** One of two types of storm water quality treatment structures are proposed for consideration: 1) a simple baffle system collects sediment, floatables and hydrocarbons carried in stormwater runoff or 2) a storm water quality structure that includes filter media designed to remove organics and nutrients.
- **Mechanicsville Road Parking Area, Watchogue Creek:** Implement stormwater improvements including the removal of the existing direct discharge to Watchogue Creek via the grated inlet in the parking area, installation of subsurface leaching chambers or galleys in the central portion of the parking lot, and installation of a bio-retention area in the existing lawn area adjacent to the west of the Creek.
- **Maple Avenue Dock, Watchogue Creek:** The top of the bulkhead should be raised and the parking lot re-graded to direct stormwater to newly established low

GREAT COVE WATERSHED IMPROVEMENT PROJECT



Location

- Various across Greater Bay Shore
 - Montauk Highway, Lawrence Creek
 - Mechanicsville Rd. Parking Area, Watchogue Creek
 - Maple Avenue Dock, Watchogue Creek
 - Gibson Street Parking Area, Watchogue Creek

Cost

- \$2,117,000

Needs

- Protect/enhance natural systems to improve flood protection, stormwater retention, and water quality
- Minimize localized flooding

Assets Made More Resilient

- Residences
- Businesses
- Community facilities
- Southside Hospital
- Roadways
- Schools

Risk Reduction & Benefits

- Improved water quality
- Decreased localized flooding
- Improved natural habitat



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points and drainage inlets within the parking area. Stormwater should be directed to a storm water quality treatment structure designed with a high flow bypass to prevent flooding during large storm events.

- **Gibson Street Parking Area, Watchogue Creek:** Install stormwater retention and treatment improvements including a narrow bio-retention area within existing striping (not currently used for parking); install permeable or porous pavement in a portion or throughout the parking lot, and install a diversion manhole to redirect stormwater runoff from the roadway conveyance system to a stormwater treatment structure.

This Featured Project would include engineering and design of the individual projects that are located on public property and construction of the improvements as outlined in the GCWMP. The projects can be done in phases, possibly utilizing the priority assignments recommended in the GCWMP.

The projects would help to reduce the inflow of sediments and pollutants into the individual creeks and into Great Cove and the South Shore Estuary. Improved water quality would enable the restoration of natural systems including submerged aquatic and coastal vegetation, resulting in increased coastal storm resiliency.

Background

The Great Cove WMP was completed by the Town of Islip in 2012 with funding from the New York State Department of State (NYS DOS). The study focused on the drainage contributing area to Great Cove, a coastal inlet that connects to the Great South Bay and extends from, approximately, Robert Moses Causeway in West Bay Shore to Heckscher State Park in East Islip. There are ten main creeks that contribute to Great Cove, seven of which are within or adjacent to the Greater Bay Shore Community. These include (from west to east) Trues Creek, Thompsons Creek, Lawrence Creek, Watchogue Creek, Penataquit Creek, Awixa Creek and Orowoc Creek. The plan characterized the existing natural, cultural and human resources within the watershed, identified key factors impacting the Great Cove watershed, provided watershed-wide and site specific recommendations for watershed and water quality improvements, and provided implementation strategies for each of the watershed recommendations.



Although the primary purpose of the plan was to provide recommendations to enhance water quality in Great Cove and in the larger South Shore Estuary, such improvements can also support coastal storm resiliency. This can occur as water quality is upgraded, allowing for the return of natural vegetation and coastal features. Enhanced water quality can help to sustain and restore marine life and coastal ecosystems, including vegetation (submerged aquatic, tidal, etc.) and coastal features (shorelines, beaches, wetlands, etc.). Healthy coastal ecosystems can help to mitigate the effects of coastal storms through wave attenuation and deflection as well as mitigating the effects of erosion. As such, natural infrastructure systems can significantly help to improve a Community's storm resiliency.

Estimated Project Cost

The approximate conceptual costs for the upgrades to the drainage system at the intersection of Montauk Highway and Lawrence Creek are estimated to be \$175,000. This includes \$130,000 for the cost of the improvement, \$32,000 in contingency cost and \$13,000 in design, permitting and construction management costs. The estimated operations and maintenance costs associated with this project are approximately \$1,000 per year. Assuming an average 30 year useful life for this enhancement, a conceptual life cycle is estimated to be \$205,000.

The approximate conceptual costs for the enhancements to the Mechanicsville Road Parking Area adjacent to the Watchogue Creek are estimated to be \$175,000. This includes \$130,000 for the cost of the improvement, \$32,000 in contingency cost and \$13,000 in design, permitting and construction management costs. The estimated operations and maintenance costs associated with this project are approximately \$1,000 per year. Assuming an average 30 year useful life for this upgrade, a conceptual life cycle cost is estimated to be \$205,000.

The approximate conceptual costs for the enhancement to the Gibson Street Parking Area adjacent to the Watchogue Creek are estimated to be \$444,000. This includes \$329,000 for the cost of the upgrade, \$82,000 in contingency cost and \$33,000 in design, permitting and construction management costs. The estimated operations and maintenance costs associated with this project are approximately \$4,000 per year. Assuming an average 30 year useful



life for this improvement, a conceptual life cycle cost is estimated to be \$564,000.

The approximate conceptual costs for the improvements to the Maple Avenue Dock adjacent to the Watchogue Creek are estimated to be \$1,323,000. This includes \$992,250 for the cost of the improvement, \$231,525 in contingency cost, and \$99,225 in engineering design costs. The estimated operations and maintenance costs associated with this project are approximately \$4,000 per year. Assuming an average 30 year useful life for this enhancement, a conceptual life cycle cost is estimated to be \$1,443,000.

Project Benefits

Risk Reduction and Resiliency

The Great Cove Watershed is a key natural resource. Improved health and management of the watershed is vital for reducing local flood impacts - particularly during events such as Superstorm Sandy. The identified projects could potentially reduce local flooding and upgrade local water quality, which will benefit all residents within the Community as well as the greater watershed and region. The projects would help to reduce the risk of post-disaster disruptions to business operations, transportation and infrastructure assets, and health and social service facilities.

Economic Benefits

The fortification of coastal resiliency through healthier and more vibrant natural systems would benefit the local economy through a reduction of storm damage. The full implementation of this Featured Project (all four improvement locations) would result in the temporary employment of 27 Full-Time Equivalents (FTEs).⁸¹

The project is consistent with the Long Island Regional Economic Development Council (REDC) Economic Development Plan which recommended the following strategy: “Protect Long Island from the perils of climate change at the same time we encourage new “cleaner, greener” industries by leading collaborative regional efforts to harden our infrastructure, businesses and homes against the next major storm and to encourage transportation, energy and construction policies that reduce our vulnerability, as well as our carbon footprint.”⁸²



Environmental Benefits

Implementation of the projects proposed in the Great Cove Watershed Plan could significantly improve water quality in the creeks, inlets and bays in the central portion of the South Shore Estuary. This is particularly important given that the estuary has been classified as an impaired water body based on Federal Clean Water Act standards. Improved water quality will benefit marine life including fish, shellfish and aquatic vegetation. It would help to restore the environmental systems in the bay to their natural functioning.

Cost Benefit Analysis

Project cost: \$2,117,000

Life-cycle cost: Total: \$2,417,000

- Montauk Highway (\$205,000);
- Mechanicsville (\$205,000);
- Gibson Street (\$564,000); and
- Maple Avenue Dock (\$1,443,000).

Recurring costs: Though recurring costs are captured in the life-cycle costs, it should be noted that operations and maintenance costs will be the responsibility of the implementing entity or other project partner.

External costs: Roads may be closed and local businesses and residents could be inconvenienced during construction.

Groups impacted: This project would reduce vulnerability in extreme- and high-risk residential areas. Critical assets, such as Maple Avenue Dock, would be secured. Assets close to the Mechanicsville area include the Business Improvement District, Montauk Highway/Main Street, Shore Drugs, Dr. George S. King Park, and the Community Reflection Garden. Additionally, downstream assets proximate to Watchogue Creek include the South Bay Marina, the Storm Sewer Pump Station at the Ocean Avenue Dock, Bay Shore Ferry Terminal, Storm Sewer Pump Station (Maple Avenue Dock), Maple Avenue Marina, Maple Avenue Dock, Ocean Avenue Dock, Bay Shore Marina (Town of Islip), and Montauk Highway/Main Street.

Savings: This project would reduce recovery costs associated with flooding and resultant personal and public property loss. In addition, the project would help to the local economy and Fire Island by alleviating freight disruptions at the Maple Avenue facility.



Opportunity cost: The assets listed above may become flooded during future storm events; 14,000 to 16,000 cars per day may lose access to roadways.

Risk Reduction Analysis

With a total area of approximately 11.5 square miles, the Great Cove Watershed is a sprawling and extensive natural system. As a result, the preservation and enhancement of the watershed reduces risk throughout much of the Community.

The four specific enhancements comprising this project have been advanced from the GCWMP as a result of their potential to reduce flooding, and improve the Community's recovery from severe weather events. Flood protection provided by this project is expected to reduce the vulnerability of residential areas within extreme and high risk areas. Additionally, this project is anticipated to reduce vulnerability to critical assets, such as the Maple Avenue Dock, and the Town of Islip's 2nd Avenue Highway Yard.

General Timeframe for Implementation

From the time that implementation begins, it is estimated that the project could be completed in approximately 18 months. Design and procurement would take approximately 6 months, environmental permitting approximately 6 months, and 6 months for implementation.

Regulatory Requirements Related to Project

One or more of the following approvals will likely be required for each project:

- New York State DEC Freshwater Wetlands permit
- New York State DEC Tidal Wetlands permit
- New York State DOS Coastal Consistency approval
- New York State Department of Transportation Highway Work permit
- Town of Islip Wetlands and Watercourses permit
- Town of Islip Highway Work permit
- Compliance with the State Environmental Quality Review Act (SEQRA)



Jurisdiction

The jurisdiction of the projects would be determined based upon the final project locations. Most would likely be within the jurisdiction of the Town of Islip. Some may also be within the jurisdiction of New York State for projects occurring on State property.



Section V: Additional Materials

A. Additional Resiliency Recommendations

Presented in Table 29 below, are Additional Resiliency Recommendations (ARR) that were identified during the planning process in addition to the Proposed and Featured Projects recommended by the Committee. Additional Resiliency Recommendations are projects and actions that the Planning Committee would like to highlight and that are not categorized as Proposed Projects or Featured Projects.

Table 29. Additional Resiliency Recommendations

Strategy	Project Name	Short Description	Estimated Cost	Regional (Y/N)
Establish municipal plans and codes that will make the Community more resilient and better able to adapt to severe storms and climate change.	Local Waterfront Revitalization Program (LWRP)	The project is to prepare and adopt local versions of the LWRP which would help to define goals for Greater Bay Shore’s waterfront area and regulate waterfront development (recreational, tourism, economic, commercial, water-enhanced uses). Completion of two LWRPs (Town of Islip and Village of Brightwaters) would position the Community to compete for State funding to implement specific projects.	\$200,000	Y
	Community Rating System (CRS)	This project has two phases. Phase I would evaluate the pros and cons of implementing the CRS as part of the National Flood Insurance Program. Phase II would be to implement this program which could lead to Community-wide insurance discounts for policy holders.	\$100,000	N
	Resiliency Review & Amendments: Municipal Codes	Review local building, zoning and flood protection codes for resiliency standards; draft amendments to codes for consideration by local legislative bodies (Town, Village).	\$150,000	N
	LIJ Southside Hospital Flood Mitigation Improvement Plan	Develop a plan to reduce the flooding events at LIJ Southside Hospital, both on-site and along the access roadways that are used by ambulances and rescue vehicles.	\$350,000	Y



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Table 29. Additional Resiliency Recommendations (Cont'd)

Strategy	Project Name	Short Description	Estimated Cost	Regional (Y/N)
Ensure continuity of service and access to critical health care facilities and to public safety services.	LIJ Southside Hospital Flood Mitigation Improvements	Complete the drainage, parking, and site improvements identified in the LIJ Southside Hospital Flood Mitigation Improvement Plan.	\$4,000,000	Y
	LIJ Southside Hospital Power Resiliency Improvements	Implement power resiliency improvements related to the relocation of electrical switch rooms and generators.	\$8,000,000	Y
	Drainage, Roadway & Utility Implementation: Main Street (South Saxon Ave. to Homan Ave.)	Implementation of improvements to roadway and storm drainage system based on Drainage, Roadway & Utility Implementation Initiative. May include new pipe installation, new oil/water separators, Sandy-related debris removal, improving or relocating outfalls, as well as the raising of roadways where appropriate or feasible.	\$2,900,000	N
	Drainage, Roadway & Utility Implementation: Lawrence Lane south of Montauk Highway		\$550,000	N
	Drainage, Roadway & Utility Implementation: Concourse East & West (Village of Brightwaters)		\$540,000	N
	Drainage, Roadway & Utility Implementation: Main Street South Court between Awixa Ave. & S. Penataquit Ave.		\$900,000	N
	Drainage, Roadway & Utility Implementation: Inlet View		\$500,000	N



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Table 29. Additional Resiliency Recommendations (Cont'd)

Strategy	Project Name	Short Description	Estimated Cost	Regional (Y/N)
Encourage safe and resilient housing for all residents.	Housing Relocation Program	Program to encourage the voluntary relocation of housing out of extreme and high risk flood locations.	\$1,000,000	N
Integrate “Green” and “Gray” infrastructure (natural and engineered stormwater management system) to holistically manage stormwater and reduce flooding.	Archie Place, Trues Pond*	Creation of a bioretention area for filtration and pollutant removal prior to overflow into Trues Pond. Additionally, the northwest side of the Pond has small pockets of lawn which have adequate area to install an offline storm water quality treatment structure.	\$175,000	N
	Oakwood Boulevard, Awixa Creek*	Drainage improvements including redirection of stormwater from the direct outfalls at the road’s crossing with Awixa Creek to a new bioretention area located within a small, Town-owned parcel on the south side of Oakwood Boulevard.	\$75,000	N
	Saxon Avenue Cul-de-sac*	Convert part of cul-de-sac to vegetated depressions for storage/treatment of stormwater runoff.	\$50,000	N
	Floodproofing/Hardening of Shore Road East Sanitary Sewer Pump Station	Assess vulnerabilities of the pump station at Shore Road East. Possible solutions may include elevating the pump stations and electrical panels relative to storm surge potential and installation of back-up power (generator).	\$200,000	N

*Identified in Great Cove Watershed Management Plan



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Table 29. Additional Resiliency Recommendations (Cont'd)

Strategy	Project Name	Short Description	Estimated Cost	Regional (Y/N)
Integrate “Green” and “Gray” infrastructure (natural and engineered stormwater management system) to holistically manage stormwater and reduce flooding (Cont'd.)	“Complete Streets” Resiliency Corridors	<p>Phase I of this project would involve a study to develop a scope for a Complete Streets Project. Phase II would implement improvements along corridors such as: (1) Fourth Avenue/Maple Avenue from the LIRR Station to the waterfront; and (2) Downtown Bay Shore (Main Street). This project would improve east-west/north-south access and connectivity at selected locations. This project would be implemented in keeping with the historic character and urban design characteristics of the Community. The project would also incorporate “Green” technologies to the extent practicable.</p>	\$4,630,000	Y
Reduce the frequency and duration of interruptions to public and private utility networks.	Tree Census and Maintenance Program	<p>This project is a comprehensive tree inventory and pruning program throughout Greater Bay Shore in those areas with overhead utility service. The program would be developed with the expertise of the utility providers as well as a certified arborist.</p>	\$250,000	N
Improve the economic resiliency of the Community.	Business & Industrial Development Program	<p>Develop a program to assist local businesses (Chamber of Commerce/BID, waterfront commercial businesses) in evaluating opportunities to increase synergies between local businesses and the tourists and residents of Fire Island. Program would also encourage the diversification of the local industrial economy.</p>	\$166,000	N
	Orinoco Drive Business District Revitalization Plan	<p>Redevelopment plan for Orinoco Drive industrial and commercial corridor in Village of Brightwaters.</p>	\$145,000	N



B. Master Table of Projects

Table 30, below, presents a compilation of projects that were identified and considered by the Committee over the course of the planning process. Projects include Proposed Projects, Featured Project, and Additional Resiliency Recommendations (ARR). The order in which the projects and actions are listed in this NYRCR Plan does not necessarily indicate the Planning Committee’s prioritization of these projects and actions.

Proposed Projects are projects proposed for funding through an NYRCR Planning Area’s allotment 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 voting members of the Planning Committee.

Table 30. Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Ensure public safety and the ability of first responders to promptly and effectively react to severe storm events and other emergencies.	Fire and Rescue Communications	Upgrade communications equipment to eliminate technical deficiencies and incompatibility of equipment among first response agencies (such as Suffolk County OEM).	Proposed	\$640,000	Y
	Fire and Rescue Equipment	Purchase of essential Search and Rescue equipment.	Proposed	\$168,000	Y
	Enhanced GIS Emergency Management System	Project to enhance a Town-wide GIS system to improve storm response and recovery.	Proposed	\$50,000	Y
	Greater Bay Shore Resiliency Generator Project	Permanent placement of fixed generators at crucial community facilities including: BSFD Headquarters, Brightwaters Village Hall, YMCA, and Bay Shore High School, Town of Islip’s 2 nd Avenue Highway Yard, Maple and Ocean Avenue Docks.	Proposed	\$1,425,000	Y



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Table 30. Master Project Table (Cont'd)

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Ensure adequate resources to enhance the ability of Community-Based Organizations (CBO) to prepare for, and respond to local emergencies.	Community-Based Organizations (CBO) & Vulnerable Populations Emergency Action & Education Plan	Development of a plan to enable CBOs to coordinate their efforts to address emergency preparedness education, evacuation, and long-term resiliency needs of vulnerable populations during and after severe weather events and emergency situations.	Proposed	\$475,000	N
	Greater Bay Shore Resiliency Generator Project	Permanent placement of fixed generators at crucial community facilities including: BSFD Headquarters, Brightwaters Village Hall, YMCA, and Bay Shore High School, Town of Islip's 2 nd Avenue Highway Yard, Maple and Ocean Avenue Docks.	Proposed	\$1,425,000	N
Improve the economic resiliency of the Community.	Bayview Avenue, Bay Shore Waterfront Corridor Improvement	"Complete Streets" improvements on Bayview Avenue between Ocean Avenue and South Clinton Avenue. Project would improve parallel access to waterfront businesses and also provide another route to evacuate from the waterfront.	Featured	\$1,300,000	N
Provide for the unique needs and requirements of vulnerable populations including the elderly, individuals with disabilities, and low income residents.	Community-Based Organizations (CBO) & Vulnerable Populations Emergency Action & Education Plan	Development of a plan to enable CBOs to coordinate their efforts to address emergency preparedness education, evacuation, and long-term resiliency needs of vulnerable populations during and after severe weather events and emergency situations.	Proposed	\$475,000	N
	Penataquit Village Housing Resiliency Enhancements	Drainage and storm water quality improvements including the use of "Green" technology (vegetated swale) would help this residential development which caters to LMI, elderly, individuals with disabilities, and families. In addition, this project would help to improve the resiliency of existing commercial and residential uses located downstream of Penataquit Village along Penataquit Creek.	Proposed	\$235,000	N
	Bayview Avenue, Bay Shore Waterfront Corridor Improvement	"Complete Streets" improvements on Bayview Avenue between Ocean Avenue and South Clinton Avenue. Project would improve parallel access along waterfront to improve evacuation opportunities.	Featured	\$1,300,000	N
Ensure continuity of service and access to critical health care facilities and to public safety services.	Drainage, Roadway & Utility Infrastructure Initiative	This initiative would undertake the design, engineering, and hydrologic study of 5 locations. Locations to be evaluated include: Main Street, Lawrence Lane, Concourse West, South Saxon Avenue, South Court between Awixa Avenue and South Penataquit, and Inlet View.	Featured	\$1,375,000	N



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Table 30. Master Project Table (Cont'd)

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Encourage safe and resilient housing for all residents.	Penataquit Village Housing Resiliency Enhancements	Drainage and storm water quality improvements including the use of “Green” technology (vegetated swale) would help this residential development which caters to LMI, elderly and individuals with disabilities as well as families. In addition, this project would help to improve the resiliency of existing commercial and residential uses located downstream of Penataquit Village along Penataquit Creek.	Proposed	\$235,000	N
Integrate “Green” and “Gray” infrastructure (natural and engineered stormwater management system) to holistically manage stormwater and reduce flooding.	Stream Corridor & Lakes Drainage Capacity Improvement Initiative	<p>This project involves the undertaking of a comprehensive drainage study and design for six creeks (Trues, Lawrence, Watchogue, Awixa, Orowoc, and Penataquit).</p> <p>The study would include an engineering analysis to identify the specific drainage areas associated with each creek, the potential volumes of water that could be expected during severe events (100-year, 500-year storms) and the capacity of the streams to store and convey that water. Based on this analysis, the study would identify specific actions that could be undertaken to improve the streams ability to store and convey storm water while also improving water quality and wildlife habitat.</p> <p>This initiative would also include the Brightwaters Artificial Lakes Storm Water Drainage Assessment (Study & Design) to evaluate the capacity of the artificial lakes in the Village.</p>	Proposed	\$1,917,000	Y
	Penataquit Village Housing Resiliency Enhancements	Drainage and storm water quality improvements including the use of “Green” technology (vegetated swale) would help this residential development which caters to LMI, elderly, individuals with disabilities, and families. In addition, this project would help to improve the resiliency of existing commercial and residential uses located downstream of Penataquit Village along Penataquit Creek.	Proposed	\$235,000	N



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Table 30. Master Project Table (Cont'd)

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Integrate “Green” and “Gray” infrastructure (natural and engineered stormwater management system) to holistically manage stormwater and reduce flooding (Cont'd).	Great Cove Watershed Improvements	Design & implementation of watershed improvements at four locations in Greater Bay Shore. These projects were included as part of the Great Cove Watershed Study (adopted by the Town of Islip in 2012). <ul style="list-style-type: none"> Montauk Highway at Lawrence Creek (\$175,000) Mechanicsville Road Parking Area, Watchogue Creek (\$175,000) Gibson Street Parking Area, Watchogue Creek (\$414,000) Maple Avenue Dock, Watchogue Creek (\$1,323,000 cost provided by Town of Islip) Projects involve the construction of bio-retention basins, improvements and installation of stormwater discharge treatment structures, increased use of permeable paving and vegetated natural areas. Maple Avenue Dock involves regrading the parking lot, drainage improvements and potential raising of the top of the bulkhead.	Featured	\$2,117,000	Y
	Stream Corridor & Lakes Drainage Capacity Improvements Implementation	Implementation of recommendations identified under the Stream Corridor & Lakes Drainage Capacity Improvement Initiative at the following locations: <ul style="list-style-type: none"> Trues Creek (\$867,000) Lawrence Creek (\$91,000) Watchogue Creek (\$574,500) Penataquit Creek (\$2,392,000) Awixa Creek (\$508,000) Orowoc Creek (\$1,340,000) The Brightwaters Artificial Lakes Storm Drainage Capacity Assessment is a management study and the implementation of physical improvements to the lake system is not included in this project.	Featured	\$5,772,500	Y



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Table 30. Master Project Table (Cont'd)

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Mitigate flooding from the Great South Bay.	Phase I: Brightwaters Canal Resiliency Improvements	The first of three phases (500 linear feet per phase) for the replacement of deteriorating or damaged bulkheading along portions of the Brightwaters Canal. This project could help to ease flooding on Montauk Highway and also benefit the Southwest Sewer District pump station near Walker Park. Phase II & III are included under Featured Projects	Proposed	\$677,000	N
	Phases II & III: Brightwaters Canal Resiliency Improvements	Phases II & III (500 linear feet per phase) for the replacement of deteriorating or damaged bulkheading along the Canal.	Featured	\$1,354,000	N
Establish municipal plans and codes that will make the Community more resilient and better able to adapt to severe storms and climate change.	Local Waterfront Revitalization Program (LWRP)	The project is to prepare and adopt local versions of the LWRP which would help to define goals for Greater Bay Shore's waterfront area and regulate waterfront development (recreational, tourism, economic, commercial, water-enhanced uses). Completion of two LWRPs (Town of Islip and Village of Brightwaters) would position the Community to compete for State funding to implement specific projects.	ARR	\$200,000	N
	Community Rating System (CRS)	This project would consist of two phases. Phase I would evaluate the applicability of implementing the CRS as part of the National Flood Insurance Program. Phase II would implement this program which could lead to Community-wide insurance discounts for policy holders.	ARR	\$100,000	N
	Resiliency Review & Amendments: Municipal Codes	Review local building, zoning and flood protection codes for resiliency standards; draft amendments to codes for consideration by local legislative bodies (Town, Village).	ARR	\$150,000	N
Ensure continuity of service and access to critical health care facilities and to public safety services.	LIJ Southside Hospital Flood Mitigation Improvement Plan	Conduct a study and develop a plan to reduce the frequency of severe flooding at LIJ Southside Hospital, both on-site and along the access roadways leading to the hospital campus that are used by rescue vehicles.	ARR	\$350,000	Y
	LIJ Southside Hospital Flood Mitigation Improvements	Complete the drainage, parking, and site improvements identified in the LIJ Southside Hospital Flood Mitigation Improvement Plan.	ARR	\$4,000,000	Y



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Table 30. Master Project Table (Cont'd)

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Ensure continuity of service and access to critical health care facilities and to public safety services (Cont'd).	LIJ Southside Hospital Power Resiliency Improvements	Implement power resiliency improvements related to the relocation of electrical switch rooms and generators.	ARR	\$8,000,000	Y
	Drainage, Roadway & Utility Implementation: Main Street (South Saxon Ave. to Homan Ave.)	Implementation of improvements to roadway and storm drainage system based on Drainage, Roadway & Utility Implementation Initiative. May include new pipe installation, new oil/water separators, Sandy-related debris removal, improving or relocating outfalls, as well as the raising of roadways where appropriate or feasible.	ARR	\$2,900,000	N
	Drainage, Roadway & Utility Implementation: Lawrence Lane south of Montauk Highway		ARR	\$550,000	N
	Drainage, Roadway & Utility Implementation: Concourse East & West (Village of Brightwaters)		ARR	\$540,000	N
	Drainage, Roadway & Utility Implementation: Main Street South Court between Awixa Ave. & S. Penataquit Ave.		ARR	\$900,000	N
	Drainage, Roadway & Utility Implementation: Inlet View		ARR	\$500,000	N
Encourage safe and resilient housing for all residents.	Housing Relocation Program		Program to encourage the voluntary relocation of housing out of extreme and high risk flood locations.	ARR	\$1,000,000
Integrate "Green" and "Gray" infrastructure (natural and engineered stormwater management system) to holistically manage stormwater and reduce flooding.	Archie Place, Trues Pond	Creation of a bioretention area for filtration and pollutant removal prior to overflow into Trues Pond. Additionally, the northwest side of the Pond has small area of lawn which has adequate area to install an offline storm water quality treatment structure.	ARR	\$175,000	N
	Oakwood Boulevard, Awixa Creek	Drainage improvements including redirection of stormwater from the direct outfalls at the road's crossing with Awixa Creek to a new bioretention area located within a small, Town-owned parcel on the south side of Oakwood Boulevard.	ARR	\$75,000	N



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Table 30. Master Project Table (Cont'd)

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Integrate “Green” and “Gray” infrastructure (natural and engineered stormwater management system) to holistically manage stormwater and reduce flooding (Cont'd).	Saxon Avenue Cul-de-sac	Conversion of a portion of cul-de-sac to vegetated depressions for use in the storage/treatment of stormwater runoff.	ARR	\$50,000	N
	Floodproofing/Hardening of Shore Road East Sanitary Sewer Pump Station	Assess vulnerabilities of the pump station at Shore Road East. Possible solutions may be elevating the pump stations and electrical panels relative to storm surge potential and the need for back-up power (generator).	ARR	\$200,000	N
	“Complete Streets” Resiliency Corridors	Phase I of this project would involve a study to develop a scope for a Complete Streets Project. Phase II would implement improvements along corridors such as: (1) Fourth Avenue/Maple Avenue from the LIRR Station to the waterfront; and (2) Downtown Bay Shore (Main Street). This project would improve east-west/north-south access and connectivity at selected locations. This project would be implemented in keeping with the historic character and urban design characteristics of the Community. The project would also incorporate “Green” technologies to the extent practicable.	ARR	\$4,630,000	N
Reduce the frequency and duration of interruptions to public and private utility networks.	Tree Census and Maintenance Program	This project is a comprehensive tree inventory and pruning program throughout Greater Bay Shore in those areas with overhead utility service. The program would be developed with the expertise of the utility providers as well as a certified arborist.	ARR	\$250,000	N
Improve the economic resiliency of the Community.	Business & Industrial Development Program	Program to assist local businesses (Chamber of Commerce/BID, waterfront commercial businesses) to evaluate opportunities to increase synergies between local businesses and tourists and residents of Fire Island. Program would also encourage the diversification of the local industrial economy.	ARR	\$166,000	N
	Orinoco Drive Business District Revitalization Plan	Redevelopment plan for Orinoco Drive industrial and commercial corridor in Village of Brightwaters.	ARR	\$145,000	N



C. Public Engagement Process

Public Engagement Strategy

New York Governor Andrew M. Cuomo has been a strong proponent of a bottom-up, community-driven planning process; in other words, the real “experts” are the residents of the communities that have been confronted first-hand by these natural disasters. This “grass-roots” process has allowed ideas, issues, and other meaningful input to inform the process that might otherwise not have been considered.

With this in mind, a critical component of the NYRCR Program is the transparent exchange of information by the Consultant Team, the Committee, and the public to identify appropriate projects, strategies, and solutions that are likely to carry Community support. The public included: area residents; employees; representatives of civic groups, neighborhood, and homeowner associations; environmental and other interest groups; business owners; representatives of governmental agencies; educational, medical, religious and other institutions; the media; and elected/appointed officials.

The Public Engagement Strategy was designed to:

- Engage and facilitate a two-way information-sharing with the public throughout the development of the NYRCR Plan;
- Educate the public about the NYRCR program and elicit comments and suggestions regarding all aspects of the NYRCR Plan within the NYRCR Community;
- Employ outreach techniques that facilitated collection and coordination of public communication and comments; and
- Reach out to groups that might normally be underrepresented in a planning study, such as minorities, Spanish-speaking residents, low-income residents, seniors, youth, and individuals with a disability.

The Committee and Consultant Team utilized a number of dissemination techniques to achieve a thorough, responsive, open, and transparent communication process. The intent of the outreach program was to understand public sentiment and to be able to answer questions and address public concerns in real and meaningful ways. Several methods were provided for the public to make comments and ask questions such as: Public Engagement meetings designed to vet the work of the Committee, public



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comment forms at Committee Meetings, on-line public meetings, focused meetings, exhibition of materials at the Public Library, and on the NYRCR Program website. The Committee used these comments to enhance and improve the NYRCR Plan.

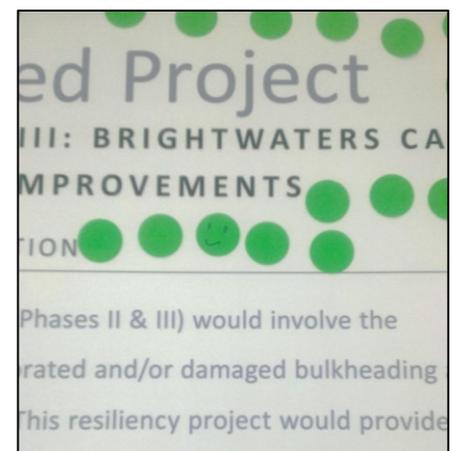
NYRCR Planning Committee Members/Meetings

All Committee meetings were open to the public. Meeting dates and times were posted on the NYRCR Program website (www.stormrecovery.ny.gov/nyrcr). For each Committee meeting, notifications were sent to the Committee Members and Governor's Office of Storm Recovery (GOSR) representatives, and meeting materials were prepared. These materials included: agendas, sign-in sheets, minutes, comment logs, PowerPoint presentations, graphics/boards, and handouts. Materials were posted to the NYRCR website. The public was also able to comment on the work of the Committee by filling out a comment form available at each Committee Meeting. These meetings were held on a regular basis at which time Committee Members discussed agenda items and reached consensus on topics such as the Community Vision statement, critical assets and risks, community needs and opportunities, public engagement event planning and feedback, strategies, and projects. Ten Committee meetings were held as of December 31, 2014.

On November 20, 2014, at the conclusion of Public Engagement Event #3, the Greater Bay Shore NYRCR Committee convened their tenth and final Committee Meeting. The purpose of this meeting was to consider feedback received earlier in the evening from the public as well as to vote on the inclusion of resiliency projects in the Final NYRCR Plan. After a short period of discussion and deliberation, the Committee unanimously agreed to recommend the projects incorporated into this Final Plan.

Public Engagement Events

In order to facilitate direct interaction with the public and to enable opportunities for questions, conversation and the transfer of information, a series of "Open House" style meetings were utilized throughout the process. This type of meeting provides the maximum flexibility for the public to attend and engage in the process even if they have limited time. The meetings ran for a minimum of two hours and provided a number of topic area displays staffed by professional experts and Committee Members that were familiar with the topic area. Attendees were invited to review the materials and speak with the staff and Committee



At Public Engagement Event #3 (November 2014), attendees identified their preferred projects.

Source: Jacobs



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Members about their insights, questions or suggestions. Attendees could choose to remain and participate for the entire length of the event or participate for only a short period of time based on their individual availability.

Each public engagement event included a display of work completed to date as well as an opportunity for attendees to provide feedback. Presentation materials were developed for each meeting that illustrated the key points of the Committee’s work to date using plain language, graphics, and simulations. These were available following the meeting on the NYRCR Program website for download and viewing. Meeting materials were available in English and if requested, in Spanish. Spanish language interpretation services were available upon request.

The process included four Public Engagement Events which are detailed in Table 31. Dates for the Committee Meetings, and topics of discussion are also noted below.



Public review of projects at Public Engagement Event #3 (November 2014).

Source: Jacobs

Table 31. Committee Meetings and Public Engagement Events

Event	Date	Topic
Committee Meeting 1	June 26, 2014	Overview of the Community Development Process
Community Tour 1	July 3, 2014	Field tour through the Greater Bay Shore area with Committee Members & Municipal Representatives to review areas of damage related to Superstorm Sandy
Committee Meeting 2	July 10, 2014	Geographic Scope, Community Vision, Storm Damage
Committee Meeting 3	July 16, 2014	Risk, Community Assets, Public Engagement Event #1 preparation
Public Engagement Event 1 (Bay Shore High School)	July 24, 2014	Defined initial Geographic Scope, Community Vision, report the Community Assets and identify Critical Issues.
First Responder Community Tour	August 21, 2014	Field tour focused on areas of First Responder/Emergency Service activity during and after Superstorm Sandy
Committee Meeting 4	August 21, 2014	Asset Mapping, Critical Issues, Needs and Opportunities
Committee Meeting 5	September 4, 2014	Needs and Opportunities, Strategies, Public Engagement, Public Engagement Event #2 preparation



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Table 31. Committee Meetings and Public Engagement Events (Cont'd)

Event	Date	Topic
Committee Meeting 6	September 10, 2014	Resiliency Strategies, Project Review and Development
Public Engagement Event 2 (Bay Shore High School in conjunction with Bay Shore Union Free Board of Education Meeting)	September 17, 2014	This event was used to confirm community assets, review the results of the risk analysis, and review Committee work to date related to resiliency strategies and potential projects. A brief overview public presentation was made during the Open House in the adjoining theatre during the Board of Education's work session
Committee Meeting 7	September 25, 2014	Resiliency Strategies, Project Review and Development
Committee Meeting 8	October 9, 2014	Refinement of Resiliency Strategies and Projects
Committee Meeting 9	November 6, 2014	Project Review, Refinement, and Categorization
Public Engagement Event 3 (BSFD Headquarters)	November 20, 2014	Public Review of Proposed and Featured Projects as well as Additional Resiliency Recommendations
Committee Meeting 10	November 20, 2014	Final Review of Materials and Committee Vote on Projects
Public Engagement Event 4	January 2015	NYRCR Plan to be presented to the Public

Outreach for the Public Engagement Events included: posting on the State's NYRCR Program webpage and other electronic media; ads in weekly print media when time and budget allows; flyers and posters at strategic locations throughout the Community including the Bay Shore – Brightwaters Public Library, Great South Bay YMCA, and other centers of activity; and e-mails and/or texts to lists available from chambers, civics, school district, churches, synagogues, American Legion, VFW, AARP, Rotary, and other community organizations. Outreach also included requests to community organizations to post information on their websites (such as the Chamber of Commerce of Greater Bay Shore). Phone calls were made to: elected officials and other leaders in the local residential and business community, and support was provided to each Committee Member to assist them with their outreach effort (e.g., calls/e-mails to their contacts and announcements at non-NYRCR Program meetings). English and Spanish language flyers were distributed to the following:



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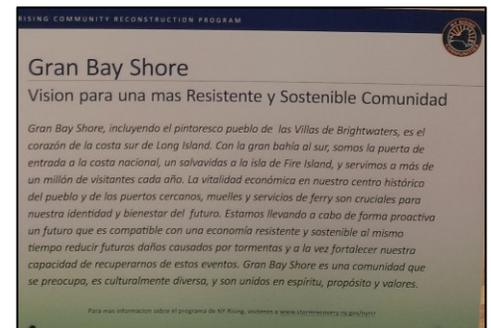
Table 32. Greater Bay Shore Public Engagement Event Distribution List

<i>Elected Officials</i>		
New York State Senator Phil Boyle (District 4)	New York State Assemblyman Phil Ramos (Assembly District 6)	Suffolk County Legislator Monica Martinez (9 th District)
<i>Media</i>		
Newsday	Islip News	WALK (Radio 97.5 FM)
WBAB (Radio 102.3 FM)	Noticia LI (Spanish-speaking)	WINS (Spanish Language Website)
<i>Civic Groups</i>		
Great South Bay YMCA	Family Service League	Greater Bay Shore Chamber of Commerce
Bay Shore-Brightwaters Public Library	Bay Shore Historical Society	Bay Shore Fire Department
<i>Houses of Worship</i>		
The Parish of St. Patrick's	Jewish Center of Bay Shore	First Baptist Church
First Congregational Church of Bay Shore	Bethel AME Church	Calvalry Baptist Church Bay Shore
St. Peter's by the Sea	Bay Shore United Methodist	UU Bay Shore
St. Luke's Lutheran Church	Sinai Reform Temple	Abundant Christian Life Fellowship
Assembly of Christian Churches	Assembly of God Church Bay Shore	South Shore Community Church
Bay Shore 7 th Day Adventists	1 st Spanish Baptist Church	Promis Church Provison
United Pentecostal Church	Gospel Lighthouse Pentecostal	
<i>Additional Outreach</i>		
Law Offices of Siben & Siben	Parking Lots behind King Park Gazebo (car windshields)	Local Businesses on Main Street (Various)

Outreach Activities

Additional outreach activities were conducted to supplement the Public Engagement Events. The NYRCR Suffolk County Regional Lead met regularly with elected and public officials – local, County, State and Federal (FEMA) to report on Committee progress as well as to generate input. Other outreach involved:

- Vulnerable Populations:** Special efforts were made to reach out to vulnerable populations within the Community. Announcements concerning meetings and events were provided in both English and Spanish language versions. Key Spanish language media such as Noticias LI and WINS Spanish language web site were notified of Public Engagement Events. Displays at meetings were also offered in Spanish and staff fluent in Spanish was made available at



Spanish Language project materials.
Source: Jacobs



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meetings to assist any attendees that preferred to discuss in Spanish details related to the NYRCR Program.

Given that the vulnerable populations within the Greater Bay Shore area have strong connections to established Community Based Organizations and Houses of Worship, an effort was made to contact these organizations and enlist their participation in the process. These organizations included: the Family Service League, Catholic Charities, the Great South Bay YMCA, and the Bay Shore Union Free School District.

Finally, only locations that provided access in accord with the Americans with Disabilities Act (ADA) were utilized for Public Engagement Events and Committee Meetings.

- **Stakeholder Meetings:** A series of meetings were held with stakeholder groups to facilitate their involvement in the process and to allow the opportunity for them to provide direct input. These included:
 - Town of Islip (July 10, 2014 and September 30, 2014)
 - Suffolk County Water Authority (August 21, 2014)
 - LIJ Southside Hospital (September 8, 2014)
 - Summit Council (September 9, 2014)
 - Village of Brightwaters Board of Trustees (September 16, 2014)
 - Bay Shore Board of Education (September 16, 2014)
 - Bay Shore Fire Department Board of Commissioners (September 16, 2014)
 - Chamber of Commerce of Greater Bay Shore (September 30, 2014)

- **Greater Bay Shore Online Community Meetings:** The Online Community Meeting was developed to supplement the Public Engagement experience as well as to enhance the dialogue between the NYRCR Program and the public. The Online Community Meeting could be viewed and completed at the convenience of Community residents and had the same content as the presentation materials displayed at Public Engagement Events. Opportunities for input through the Online Community Meetings were provided for two weeks after each Public Engagement Meeting.



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This approach was instituted in order to reach out to seniors, individuals with disabilities or others who may have wished to participate in person but might have been unable to leave their homes. It was also a potentially useful technique to access those who may have needed to work or had other reasons for not attending the Public Engagement Events in person. Additional comments beyond those at the Public Engagement Events were received via the Online Community Meetings and incorporated into this NYRCR Plan.

- **Website:** The Greater Bay Shore NYRCR webpage (www.stormrecovery.ny.gov/nyrcr/community/bay-shore) served as a repository for downloadable versions of all public information and event notifications. Posted materials included an overview of the planning process, maps, summaries, notices, and materials from Public Engagement Events, as well as contact information. The website includes an area to accept public comment.
- **NYRCR Staff Communication:** The primary contact for the Study Team was the NYRCR Suffolk County Regional Lead. The NYRCR Suffolk County Regional Lead was also available to directly answer specific questions and receive comments.
- **E-Mail:** E-mail comments and requests for information could be sent to the State's e-mail address at: info@stormrecovery.ny.gov. This email address was prominently displayed on all materials and the website so that it was widely disseminated and available for public use.

D. Community Asset Inventory

Two tables are presented in the following section. Table 33 is an inventory of assets in Greater Bay Shore and includes the name of each asset, risk area, asset class, critical facility designation, community value, and landscape attributes. Table 34 builds off of the Asset Inventory Worksheet (Table 33) and includes a risk assessment score for each asset located in the extreme, high or moderate risk areas; FEMA-critical assets; and assets identified by the Committee and/or the public as being of important Community value.

The Risk Assessment spreadsheet contains similar information to the Asset Inventory Worksheet in addition to the risk assessment



score. The approach to using the Risk Assessment Tool, developed by the New York State Department of State (NYS DOS), was as follows:

Using the Risk Assessment Tool

The dual purpose of the Risk Assessment Tool was:

- To provide risk information as a means to identify and evaluate management measures; and
- To provide a standardized Risk Assessment process for the NYRCR Program.

The assets catalogued in the Community Asset Inventory included preliminary data such as asset name and type, asset category, as well as risk area and asset class. This task included a review of GIS datasets, aerial imagery, Community and Committee input and field verification. Most of the Risk Assessment tool fields were populated using appropriate data from the consolidated database. Two important aspects of the tool relate to how to accurately determine the exposure and vulnerability score.

Exposure Score

The exposure score was automatically populated in the Risk Assessment Tool based on landscape attribute information. Grouped assets based on similar exposure were given the same exposure score. Data that informed the exposure score include a review of Coastal Erosion Hazard Area (CeHa) maps, aerial imagery, and site reconnaissance as well as a reliance on local knowledge and input from the Project Manager/and or Committee.

Vulnerability Score

For each asset, the vulnerability score was determined based on State guidance (based on *Table 3: Vulnerability based on Impact of Service or Function of Community Assets* contained in *Guidance for Community Reconstruction Zone Plans*) as well as local background knowledge. Vulnerability typically pertains to length of time that a resource is out of service or a reduction in service capacity.⁸³

Risk Score Range

After populating the Risk Assessment Tool with attribute information (such as basic data; hazard area; exposure; vulnerability, etc.) a Risk Score was automatically generated. The Risk Score relied on past experience as a predictor of future risk and



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included some subjective analysis. For a 100-year event, the Risk Scores were classified into four categories: Residual, Moderate, High, and Severe.

As previously indicated, Table 33, below, is an inventory of assets in Greater Bay Shore and includes the name of each asset, risk area, asset class, critical facility designation, community value, and landscape attributes. Table 34, which follows, includes a risk assessment score for each asset (identified in Table 33) that is located in the extreme, high or moderate risk areas; FEMA-critical assets; and assets identified by the Committee and/or the public as being of important Community value.



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Table 33. Asset Inventory Worksheet

Asset Information									Landscape Attributes					
Asset Name	Address	Geographic Coordinates	Risk Area	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate: Long-term average erosion rate 1 foot or more/year, or unknown	Beach Width: Waterline frequently at shore defense or upland vegetation	Shore Defenses: Shore defenses absent, not constructed to anticipated storm or sea level rise conditions, or deteriorating	Vegetation: Protective vegetation, wetlands, or intervening structures between asset and flood source absent	Dunes or Bluffs: Dunes absent, below BFE, or eroding (scarped), discontinuous, or have little vegetation. Bluff slope is unstable, partially vegetated.	Soils: Asset located on a coastal barrier island or filled wetland
Cell Tower	225 Howells Road, Bay Shore NY 11706	-73.198845, 40.640366	-	Infrastructure Systems	Telecommunications	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
Village Hall: Brightwaters	40 Seneca Drive, Brightwaters NY 11718	-73.19799, 40.640131	-	Health and Social Services	Government and Administrative Services	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
Post Office: Bay Shore	1314 5th Avenue, Bay Shore NY 11706	-73.197358, 40.639055	-	Health and Social Services	Government and Administrative Services	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
Mary G. Clarkson School	1415 E 3rd Avenue, Bay Shore NY 11706	-73.205361, 40.637167	-	Health and Social Services	Schools	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Bay Shore Middle School (Shelter)	393 Brook Avenue, Bay Shore, NY 11706	-73.207302, 40.633853	-	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High	No	No	Yes	Yes	Yes	No
Gardiner Manor School	125 Wohseepee Drive, Bay Shore, NY 11706	-73.198589, 40.640588	-	Health and Social Services	Schools	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
SCWA Property	165 N Clinton Avenue, Bay Shore, NY 11706	-73.198509, 40.640269	-	Infrastructure Systems	Water Supply	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
Bay Shore HQ Fire Station (Underground Tanks)	195 5th Avenue, Bay Shore, NY 11706	-73.197862, 40.639811	-	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High	No	No	Yes	Yes	Yes	No
Bay Shore High School (Shelter)	155 3rd Avenue, Bay Shore, NY 11706	-73.185789, 40.640583	-	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High	No	No	Yes	Yes	Yes	No



Greater Bay Shore NY Rising Community Reconstruction Plan

Table 33. Asset Inventory Worksheet (Cont'd)

Asset Information									Landscape Attributes					
Asset Name	Address	Geographic Coordinates	Risk Area	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate: Long-term average erosion rate 1 foot or more/year, or unknown	Beach Width: Waterline frequently at shore defense or upland vegetation	Shore Defenses: Shore defenses absent, not constructed to anticipated storm or sea level rise conditions, or deteriorating	Vegetation: Protective vegetation, wetlands, or intervening structures between asset and flood source absent	Dunes or Bluffs: Dunes absent, below BFE, or eroding (scarped), discontinuous, or have little vegetation. Bluff slope is unstable, partially vegetated.	Soils: Asset located on a coastal barrier island or filled wetland
Town of Islip DPW Fueling Facility	2nd Avenue, Bay Shore, NY 11706	-73.185597, 40.640635	-	Infrastructure Systems	Power Supply	Yes	Yes, FEMA	High	No	No	Yes	Yes	Yes	No
First Baptist Church	175 2nd Ave Bay, Shore, NY 11706	-73.186078, 40.638695	-	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
Brook Avenue Elementary School	45 Brook Avenue, Bay Shore, NY 11706	-73.192014, 40.63653	-	Health and Social Services	Schools	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Bay Shore Fire Station 2	Tillie Street, Bay Shore, NY 11706	-73.185792, 40.640848	-	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High	No	No	Yes	Yes	Yes	No
Cingular Wireless Cell Tower		-73.176505, 40.640127	-	Infrastructure Systems	Telecommunications	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
SCWA Property		-73.176588, 40.640207	-	Infrastructure Systems	Water Supply	Yes	Yes, FEMA	High	No	No	Yes	Yes	Yes	No
Post Office: Brightwaters	145 Orinoco Dr, Brightwaters, NY 11718	-73.178608, 40.64107	-	Health and Social Services	Government and Administrative Services	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
Bay Shore Fire Station 1		-73.162948, 40.646211	-	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High	No	No	Yes	Yes	Yes	No
LIPA Plume Filtration Site		-73.162714, 40.645467	-	Infrastructure Systems	Hazardous Materials, Solid Waste, and Recycling	Yes	Yes, FEMA	High	No	No	Yes	Yes	Yes	No
Fifth Avenue School	217 Fifth Avenue Bay Shore, NY 11706	-73.149735, 40.648588	-	Health and Social Services	Schools	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Bay Shore LIRR Station	Park Avenue and Oak Street to Railroad Plaza	-73.149593, 40.648514	-	Infrastructure Systems	Transportation	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No



Greater Bay Shore NY Rising Community Reconstruction Plan

Table 33. Asset Inventory Worksheet (Cont'd)

Asset Information									Landscape Attributes					
Asset Name	Address	Geographic Coordinates	Risk Area	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate: Long-term average erosion rate 1 foot or more/year, or unknown	Beach Width: Waterline frequently at shore defense or upland vegetation	Shore Defenses: Shore defenses absent, not constructed to anticipated storm or sea level rise conditions, or deteriorating	Vegetation: Protective vegetation, wetlands, or intervening structures between asset and flood source absent	Dunes or Bluffs: Dunes absent, below BFE, or eroding (scarped), discontinuous, or have little vegetation. Bluff slope is unstable, partially vegetated.	Soils: Asset located on a coastal barrier island or filled wetland
Frank Bros Fuel Property	7 Belford Avenue, Bay Shore, NY 11706	-73.154557, 40.648821	Moderate	Infrastructure Systems	Wastewater	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
South Country School	885 Hampshire Road, West Bay Shore, NY 11706	-73.156846, 40.648976	Moderate	Health and Social Services	Schools	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Southward Ho Country Club	601 W Montauk Hwy, Bay Shore, NY 11706	-73.155736, 40.649034	Moderate	Natural and Cultural Resources	Parks and Recreation	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
St. Peter's By The Sea	500 South Country Road Bay Shore, NY 11706	-73.155046, 40.647537	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
Bay Shore-Brightwaters Public Library	1 S Country Road, Brightwaters, NY 11718	-73.156713, 40.64884	Moderate	Health and Social Services	Libraries	Yes	Yes, FEMA	High	No	No	Yes	Yes	Yes	No
St. Luke's Church	3 Lawrence Lane, Bay Shore, NY	-73.157683, 40.649055	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
Sagtikos Manor	677 Montauk Highway, Bay Shore NY 11706	-73.158317, 40.648909	Moderate	Natural and Cultural Resources	Historic Landmarks and Facilities	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
Bay Shore Jewish Center	26 N Clinton Avenue, Bay Shore, NY 11706	-73.159052, 40.648704	-	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No, Locally Significant	Low	No	No	Yes	Yes	Yes	No
Low Income Senior Housing	33 N Clinton Avenue, Bay Shore, NY 11706	-73.157801, 40.646372	-	Housing	Senior Housing	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No



Greater Bay Shore NY Rising Community Reconstruction Plan

Table 33. Asset Inventory Worksheet (Cont'd)

Asset Information									Landscape Attributes					
Asset Name	Address	Geographic Coordinates	Risk Area	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate: Long-term average erosion rate 1 foot or more/year, or unknown	Beach Width: Waterline frequently at shore defense or upland vegetation	Shore Defenses: Shore defenses absent, not constructed to anticipated storm or sea level rise conditions, or deteriorating	Vegetation: Protective vegetation, wetlands, or intervening structures between asset and flood source absent	Dunes or Bluffs: Dunes absent, below BFE, or eroding (scarped), discontinuous, or have little vegetation. Bluff slope is unstable, partially vegetated.	Soils: Asset located on a coastal barrier island or filled wetland
St. Patrick Church (Hospitality Center)	9 N Clinton Ave, Bay Shore, NY 11706	-73.15591, 40.644273	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	Yes, FEMA	High	No	No	Yes	Yes	Yes	No
Great South Bay YMCA	200 West Main Street, Bay Shore, NY 11706	-73.154843, 40.649233	Moderate	Natural and Cultural Resources	Parks and Recreation	Yes	Yes, FEMA	High	No	No	Yes	Yes	Yes	No
Business Improvement District		-73.152283, 40.648215	Moderate	Economic	Downtown Center	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Montauk Highway/Main Street	Montauk Highway/Main Street	-73.155572, 40.647123	Moderate	Economic	Downtown Center	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Bay Shore United Methodist Church	107 E Main St, Bay Shore, NY 11706	-73.157769, 40.649234	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
Second Avenue Firehouse	17 Second Avenue, Bay Shore NY 11706	-73.159441, 40.648652	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
First Congregational Church of Bay Shore	1860 Union Blvd, Bay Shore, NY 11706	-73.150337, 40.648794	-	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Old Mill Pond		-73.144118, 40.649022	Moderate	Natural and Cultural Resources	Water Bodies	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Bay Shore-Brightwaters Rescue Ambulance	911 Aletta Place, Bay Shore, NY 11706	-73.140539, 40.65001	Moderate	Health and Social Services	Emergency Operations/Response	Yes	Yes, FEMA	High	No	No	Yes	Yes	Yes	No
LIJ Southside Hospital	301 East Main Street Bay Shore NY 11706	-73.139345, 40.650363	Moderate	Health and Social Services	Healthcare Facilities	Yes	Yes, FEMA	High	No	No	Yes	Yes	Yes	No



Greater Bay Shore NY Rising Community Reconstruction Plan

Table 33. Asset Inventory Worksheet (Cont'd)

Asset Information									Landscape Attributes					
Asset Name	Address	Geographic Coordinates	Risk Area	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate: Long-term average erosion rate 1 foot or more/year, or unknown	Beach Width: Waterline frequently at shore defense or upland vegetation	Shore Defenses: Shore defenses absent, not constructed to anticipated storm or sea level rise conditions, or deteriorating	Vegetation: Protective vegetation, wetlands, or intervening structures between asset and flood source absent	Dunes or Bluffs: Dunes absent, below BFE, or eroding (scarped), discontinuous, or have little vegetation. Bluff slope is unstable, partially vegetated.	Soils: Asset located on a coastal barrier island or filled wetland
New York SMSA Cell Tower		-73.132962, 40.651304	Moderate	Infrastructure Systems	Telecommunications	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
LIJ Southside Outpatient Cancer/Oncology Center	301 East Main Street Bay Shore NY 11706	-73.134573, 40.651815	Moderate	Health and Social Services	Healthcare Facilities	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Gardiner County Park	Gardiners County Park, Route 27A, Bay Shore, NY 11706	-73.135314, 40.651532	Extreme	Natural and Cultural Resources	Parks and Recreation	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes
Bay Shore Yacht Club	20 Shore Road, Bay Shore, NY 11706	-73.132186, 40.650892	Extreme	Economic	Marina/Water Based Business	Yes	No, Locally Significant	Low	No	No	Yes	Yes	Yes	No
Walker Park	6 West Shore Road, Bay Shore, NY 11706	-73.090238, 40.66021	Extreme	Natural and Cultural Resources	Parks and Recreation	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes
Brightwaters Canal	165 Concourse East, Brightwaters, NY 11718	-73.254006, 40.707599	-	Natural and Cultural Resources	Water Bodies	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes
Gilbert Park	27 S. Windsor Avenue Brightwaters NY 11718	-73.090494, 40.66002	Moderate	Natural and Cultural Resources	Parks and Recreation	Yes	No, Locally Significant	Low	No	Yes	Yes	Yes	Yes	Yes
Bay Shore Marina (Town of Islip)	South Clinton Avenue Bay Shore, NY 11706	-73.090779, 40.659988	Moderate	Economic	Marina/Water Based Business	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes
South Bay Marina		-73.085295, 40.66166	Extreme	Economic	Marina/Water Based Business	Yes	No, Locally Significant	Medium	No	Yes	Yes	Yes	Yes	Yes
Storm Sewer Pump Station (Ocean Avenue Dock)		-73.069556, 40.665358	Extreme	Infrastructure Systems	Marine commerce facilities	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes



Greater Bay Shore NY Rising Community Reconstruction Plan

Table 33. Asset Inventory Worksheet (Cont'd)

Asset Information									Landscape Attributes					
Asset Name	Address	Geographic Coordinates	Risk Area	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate: Long-term average erosion rate 1 foot or more/year, or unknown	Beach Width: Waterline frequently at shore defense or upland vegetation	Shore Defenses: Shore defenses absent, not constructed to anticipated storm or sea level rise conditions, or deteriorating	Vegetation: Protective vegetation, wetlands, or intervening structures between asset and flood source absent	Dunes or Bluffs: Dunes absent, below BFE, or eroding (scarped), discontinuous, or have little vegetation. Bluff slope is unstable, partially vegetated.	Soils: Asset located on a coastal barrier island or filled wetland
Atria Bay Shore Senior Living	53 Ocean Avenue Bay Shore NY 11706	-73.073315, 40.664459	Moderate	Housing	Senior Housing	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Bay Shore Ferry Terminal	99 Maple Avenue Bay Shore, NY	-73.059483, 40.667791	Extreme	Infrastructure Systems	Navigable waterway facilities	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes
Storm Sewer Pump Station (Maple Avenue Dock)		-73.001477, 40.684962	Extreme	Infrastructure Systems	Marine commerce facilities	Yes	Yes, FEMA	Medium	No	Yes	Yes	Yes	Yes	Yes
Maple Avenue Marina	121 Maple Ave, Bay Shore, NY 11706	-73.00351, 40.685437	Extreme	Economic	Marina/Water Based Business	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes
Suffolk County DPW Sewage Pumping Facility		-72.990365, 40.692187	Extreme	Infrastructure Systems	Wastewater	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes
Montfort Seminary	26 South Saxon Avenue Bay Shore, NY 11706	-73.2287275, 40.7242653	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
Coastal Yachting Center & Marina	41 Degnon Boulevard Bay Shore, NY 11706	-73.153127, 40.646077	Extreme	Economic	Marina/Water Based Business	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes
Bay Shore Housing - Extreme Risk Area	Multiple Locations	-	Extreme	Housing	Mixed-Use Housing	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes
Bay Shore Housing - High Risk Area	Multiple Locations	-	High	Housing	Mixed-Use Housing	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Bay Shore Housing - Moderate Risk Area	Multiple Locations	-	Moderate	Housing	Mixed-Use Housing	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
West Bay Shore Housing - Extreme Risk Area	Multiple Locations	-	Extreme	Housing	Mixed-Use Housing	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes
West Bay Shore Housing - High Risk Area	Multiple Locations	-	High	Housing	Mixed-Use Housing	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No



Greater Bay Shore NY Rising Community Reconstruction Plan

Table 33. Asset Inventory Worksheet (Cont'd)

Asset Information									Landscape Attributes					
Asset Name	Address	Geographic Coordinates	Risk Area	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate: Long-term average erosion rate 1 foot or more/year, or unknown	Beach Width: Waterline frequently at shore defense or upland vegetation	Shore Defenses: Shore defenses absent, not constructed to anticipated storm or sea level rise conditions, or deteriorating	Vegetation: Protective vegetation, wetlands, or intervening structures between asset and flood source absent	Dunes or Bluffs: Dunes absent, below BFE, or eroding (scarped), discontinuous, or have little vegetation. Bluff slope is unstable, partially vegetated.	Soils: Asset located on a coastal barrier island or filled wetland
West Bay Shore Housing - Moderate Risk Area	Multiple Locations	-	Moderate	Housing	Mixed-Use Housing	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Brightwaters Housing - Extreme Risk Area	Multiple Locations	-	Extreme	Housing	Mixed-Use Housing	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes
Brightwaters Housing - High Risk Area	Multiple Locations	-	High	Housing	Mixed-Use Housing	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Brightwaters Housing - Moderate Risk Area	Multiple Locations	-	Moderate	Housing	Mixed-Use Housing	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Suffolk County DPW Sewage Pumping Facility	2 Prospect Street Bay Shore, NY 11706	-73.246737, 40.713791	Extreme	Infrastructure Systems	Wastewater	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes
Shore Drugs	30 East Main Street Bay Shore, NY 11706	-73.247041, 40.721795	Moderate	Health and Social Services	Healthcare Facilities	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
Brightwaters Lakes	South Country Road Brightwaters, NY 11706	-73.261938, 40.712762	High	Natural and Cultural Resources	Water Bodies	Yes	No, Locally Significant	Medium	No	Yes	Yes	Yes	Yes	Yes
South Shore Professional Plaza	180 East Main Street Bay Shore, NY 11706	-73.243145, 40.724096	Moderate	Health and Social Services	Healthcare Facilities	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Bay Shore Animal Hospital	202 East Main Street Bay Shore, NY 11706	-73.24253, 40.72434	Moderate	Health and Social Services	Healthcare Facilities	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
Good Samaritan Hospital Dialysis	929 Sunrise Highway, Bay Shore, NY 11706	-73.276131, 40.730526	-	Health and Social Services	Healthcare Facilities	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No



Table 33. Asset Inventory Worksheet (Cont'd)

Asset Information									Landscape Attributes					
Asset Name	Address	Geographic Coordinates	Risk Area	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate: Long-term average erosion rate 1 foot or more/year, or unknown	Beach Width: Waterline frequently at shore defense or upland vegetation	Shore Defenses: Shore defenses absent, not constructed to anticipated storm or sea level rise conditions, or deteriorating	Vegetation: Protective vegetation, wetlands, or intervening structures between asset and flood source absent	Dunes or Bluffs: Dunes absent, below BFE, or eroding (scarped), discontinuous, or have little vegetation. Bluff slope is unstable, partially vegetated.	Soils: Asset located on a coastal barrier island or filled wetland
Touro College School of Health Sciences			Moderate	Health and Social Services	Healthcare Facilities	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Gardiner Manor Mall			-	Economic	Employment Hub	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Watchogue Creek Park			High	Natural and Cultural Resources	Parks and Recreation	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes
Dr. George S. King Park			Moderate	Natural and Cultural Resources	Parks and Recreation	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Community Reflection Garden			Moderate	Natural and Cultural Resources	Parks and Recreation	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No
Homan Avenue Dock			Extreme	Natural and Cultural Resources	Parks and Recreation	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes
Maple Avenue Dock			Extreme	Natural and Cultural Resources	Parks and Recreation	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes
Ocean Avenue Dock			Extreme	Natural and Cultural Resources	Parks and Recreation	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes
Isbrandtsen Wetlands			Extreme	Natural and Cultural Resources	Wetlands and marshes	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes
St. Patrick's School			Moderate	Health and Social Services	Schools	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	No



Table 33. Asset Inventory Worksheet (Cont'd)

Asset Information									Landscape Attributes					
Asset Name	Address	Geographic Coordinates	Risk Area	Asset Class	Asset Subcategory	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate: Long-term average erosion rate 1 foot or more/year, or unknown	Beach Width: Waterline frequently at shore defense or upland vegetation	Shore Defenses: Shore defenses absent, not constructed to anticipated storm or sea level rise conditions, or deteriorating	Vegetation: Protective vegetation, wetlands, or intervening structures between asset and flood source absent	Dunes or Bluffs: Dunes absent, below BFE, or eroding (scarped), discontinuous, or have little vegetation. Bluff slope is unstable, partially vegetated.	Soils: Asset located on a coastal barrier island or filled wetland
Gibson-Mack Holt House			Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	Yes	No, Locally Significant	High	No	No	Yes	Yes	Yes	Yes
PSEG Substation			-	Infrastructure Systems	Power Supply	Yes	Yes, FEMA	High	No	No	Yes	Yes	Yes	No
Orinoco Drive Commercial Area			Moderate	Economic	Downtown Center	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
SC DPW Sewage Pumping Facility			Moderate	Infrastructure Systems	Wastewater	Yes	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes
Brightwaters Highway Department			-	Infrastructure Systems	Government and Administrative Services	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No
Wohseepee Park			-	Natural and Cultural Resources	Parks and Recreation	Yes	No, Locally Significant	Medium	No	No	Yes	Yes	Yes	No



Greater Bay Shore NY Rising Community Reconstruction Plan

Table 34. Risk Assessment Tool

Asset Information						Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Critical Facility	Community Value	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Cell Tower	-	Infrastructure Systems	Telecommunications	No, Locally Significant	Medium	3	-	1	0
Village Hall: Brightwaters	-	Health and Social Services	Government and Administrative Services	No, Locally Significant	Medium	3	-	1	0
Post Office: Bay Shore	-	Health and Social Services	Government and Administrative Services	No, Locally Significant	Medium	3	-	1	0
Mary G. Clarkson School	-	Health and Social Services	Schools	No, Locally Significant	High	3	-	1	0
Bay Shore Middle School (Shelter)	-	Health and Social Services	Emergency Operations/Response	Yes, FEMA	High	3	-	1	0
Gardiner Manor School	-	Health and Social Services	Schools	No, Locally Significant	High	3	-	1	0
SCWA Property	-	Infrastructure Systems	Water Supply	No, Locally Significant	Medium	3	-	1	0
Bay Shore HQ Fire Station (Underground Tanks)	-	Health and Social Services	Emergency Operations/Response	Yes, FEMA	High	3	-	1	0
Bay Shore High School (Shelter)	-	Health and Social Services	Emergency Operations/Response	Yes, FEMA	High	3	-	1	0
Town of Islip DPW Fueling Facility	-	Infrastructure Systems	Power Supply	Yes, FEMA	High	3	-	1	0
First Baptist Church	-	Natural and Cultural Resources	Cultural or Religious Establishments	No, Locally Significant	Medium	3	-	1	0
Brook Avenue Elementary School	-	Health and Social Services	Schools	No, Locally Significant	High	3	-	1	0
Bay Shore Fire Station 2	-	Health and Social Services	Emergency Operations/Response	Yes, FEMA	High	3	-	1	0
Cingular Wireless Cell Tower	-	Infrastructure Systems	Telecommunications	No, Locally Significant	High	3	-	1	0
SCWA Property	-	Infrastructure Systems	Water Supply	Yes, FEMA	High	3	-	1	0
Post Office: Brightwaters	-	Health and Social Services	Government and Administrative Services	No, Locally Significant	Medium	3	-	1	0
Bay Shore Fire Station 1	-	Health and Social Services	Emergency Operations/Response	Yes, FEMA	High	3	-	1	0
LIPA Plume Filtration Site	-	Infrastructure Systems	Hazardous Materials, Solid Waste, and Recycling	Yes, FEMA	High	3	-	1	0
Fifth Avenue School	-	Health and Social Services	Schools	No, Locally Significant	High	3	-	1	0
Bay Shore LIRR Station	-	Infrastructure Systems	Transportation	No, Locally Significant	High	3	-	1	0
Frank Bros Fuel Property	Moderate	Infrastructure Systems	Wastewater	No, Locally Significant	High	3	2.00	3	18
South Country School	Moderate	Health and Social Services	Schools	No, Locally Significant	High	3	2.00	3	18
Southward Ho Country Club	Moderate	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Medium	3	2.00	3	18
St. Peter's By The Sea	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	No, Locally Significant	Medium	3	2.00	3	18
Bay Shore-Brightwaters Public Library	Moderate	Health and Social Services	Libraries	Yes, FEMA	High	3	2.00	3	18
St. Luke's Church	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	No, Locally Significant	Medium	3	2.00	3	18
Sagtikos Manor	Moderate	Natural and Cultural Resources	Historic Landmarks and Facilities	No, Locally Significant	Medium	3	2.00	3	18
Bay Shore Jewish Center	-	Natural and Cultural Resources	Cultural or Religious Establishments	No, Locally Significant	Low	3	-	1	0
Low Income Senior Housing	-	Housing	Senior Housing	No, Locally Significant	High	3	-	1	0
St. Patrick Church (Hospitality Center)	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	Yes, FEMA	High	3	2.00	3	18
Great South Bay YMCA	Moderate	Natural and Cultural Resources	Parks and Recreation	Yes, FEMA	High	3	2.00	3	18
Business Improvement District	Moderate	Economic	Downtown Center	No, Locally Significant	High	3	2.00	3	18
Montauk Highway/Main Street	Moderate	Economic	Downtown Center	No, Locally Significant	High	3	2.00	3	18



Greater Bay Shore NY Rising Community Reconstruction Plan

Table 34. Risk Assessment Tool (Cont'd)

Asset Information						Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Critical Facility	Community Value	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Bay Shore United Methodist Church	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	No, Locally Significant	Medium	3	2.00	3	18
Second Avenue Firehouse	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	No, Locally Significant	High	3	2.00	3	18
First Congregational Church of Bay Shore	-	Natural and Cultural Resources	Cultural or Religious Establishments	No, Locally Significant	High	3	-	1	0
Old Mill Pond	Moderate	Natural and Cultural Resources	Water Bodies	No, Locally Significant	High	3	2.00	3	18
Bay Shore-Brightwaters Rescue Ambulance	Moderate	Health and Social Services	Emergency Operations/Response	Yes, FEMA	High	3	2.00	4	24
LIJ Southside Hospital	Moderate	Health and Social Services	Healthcare Facilities	Yes, FEMA	High	3	2.00	4	24
New York SMSA Cell Tower	Moderate	Infrastructure Systems	Telecommunications	No, Locally Significant	Medium	3	2.00	3	18
LIJ Southside Outpatient Cancer/Oncology Center	Moderate	Health and Social Services	Healthcare Facilities	No, Locally Significant	High	3	2.00	4	24
Gardiner County Park	Extreme	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	High	3	4.50	5	68
Bay Shore Yacht Club	Extreme	Economic	Marina/Water Based Business	No, Locally Significant	Low	3	3.50	5	53
Walker Park	Extreme	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	High	3	4.50	5	68
Brightwaters Canal	-	Natural and Cultural Resources	Water Bodies	No, Locally Significant	High	3	-	1	0
Gilbert Park	Moderate	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Low	3	3.00	3	27
Bay Shore Marina (Town of Islip)	Moderate	Economic	Marina/Water Based Business	No, Locally Significant	High	3	3.00	3	27
South Bay Marina	Extreme	Economic	Marina/Water Based Business	No, Locally Significant	Medium	3	4.50	5	68
Storm Sewer Pump Station (Ocean Avenue Dock)	Extreme	Infrastructure Systems	Marine commerce facilities	Yes, FEMA	High	3	4.50	5	68
Atria Bay Shore Senior Living	Moderate	Housing	Senior Housing	No, Locally Significant	High	3	2.00	3	18
Bay Shore Ferry Terminal	Extreme	Infrastructure Systems	Navigable waterway facilities	No, Locally Significant	High	3	4.50	5	68
Storm Sewer Pump Station (Maple Avenue Dock)	Extreme	Infrastructure Systems	Marine commerce facilities	Yes, FEMA	Medium	3	4.50	5	68
Maple Avenue Marina	Extreme	Economic	Marina/Water Based Business	No, Locally Significant	High	3	4.50	5	68
Suffolk County DPW Sewage Pumping Facility	Extreme	Infrastructure Systems	Wastewater	Yes, FEMA	High	3	4.50	5	68
Montfort Seminary	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	No, Locally Significant	Medium	3	2.00	3	18
Coastal Yachting Center & Marina	Extreme	Economic	Marina/Water Based Business	No, Locally Significant	High	3	4.50	5	68
Bay Shore Housing - Extreme Risk Area	Extreme	Housing	Mixed-Use Housing	No, Locally Significant	High	3	4.50	5	68
Bay Shore Housing - High Risk Area	High	Housing	Mixed-Use Housing	No, Locally Significant	High	3	2.50	4	30
Bay Shore Housing - Moderate Risk Area	Moderate	Housing	Mixed-Use Housing	No, Locally Significant	High	3	2.00	3	18
West Bay Shore Housing - Extreme Risk Area	Extreme	Housing	Mixed-Use Housing	No, Locally Significant	High	3	4.50	5	68
West Bay Shore Housing - High Risk Area	High	Housing	Mixed-Use Housing	No, Locally Significant	High	3	2.50	4	30
West Bay Shore Housing - Moderate Risk Area	Moderate	Housing	Mixed-Use Housing	No, Locally Significant	High	3	2.00	3	18
Brightwaters Housing - Extreme Risk Area	Extreme	Housing	Mixed-Use Housing	No, Locally Significant	High	3	4.50	5	68
Brightwaters Housing - High Risk Area	High	Housing	Mixed-Use Housing	No, Locally Significant	High	3	2.50	4	30
Brightwaters Housing - Moderate Risk Area	Moderate	Housing	Mixed-Use Housing	No, Locally Significant	High	3	2.00	3	18
Suffolk County DPW Sewage Pumping Facility	Extreme	Infrastructure Systems	Wastewater	Yes, FEMA	High	3	4.50	5	68
Shore Drugs	Moderate	Health and Social Services	Healthcare Facilities	No, Locally Significant	Medium	3	2.00	3	18
Brightwaters Lakes	High	Natural and Cultural Resources	Water Bodies	No, Locally Significant	Medium	3	3.50	4	42



Table 34. Risk Assessment Tool (Cont'd)

Asset Information						Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Critical Facility	Community Value	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
South Shore Professional Plaza	Moderate	Health and Social Services	Healthcare Facilities	No, Locally Significant	High	3	2.00	3	18
Bay Shore Animal Hospital	Moderate	Health and Social Services	Healthcare Facilities	No, Locally Significant	Medium	3	2.00	3	18
Good Samaritan Hospital Dialysis	-	Health and Social Services	Healthcare Facilities	No, Locally Significant	High	3	-	1	0
Touro College School of Health Sciences	Moderate	Health and Social Services	Healthcare Facilities	No, Locally Significant	High	3	2.00	3	18
Gardiner Manor Mall	-	Economic	Employment Hub	No, Locally Significant	High	3	-	1	0
Watchogue Creek Park	High	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	High	3	3.50	4	42
Dr. George S. King Park	Moderate	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	High	3	2.00	3	18
Community Reflection Garden	Moderate	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	High	3	2.00	3	18
Homan Avenue Dock	Extreme	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	High	3	4.50	5	68
Maple Avenue Dock	Extreme	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	High	3	4.50	5	68
Ocean Avenue Dock	Extreme	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	High	3	4.50	5	68
Isbrandtsen Wetlands	Extreme	Natural and Cultural Resources	Wetlands and marshes	No, Locally Significant	High	3	4.50	5	68
St. Patrick's School	Moderate	Health and Social Services	Schools	No, Locally Significant	High	3	2.00	3	18
Gibson-Mack Holt House	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	No, Locally Significant	High	3	2.50	3	23
PSEG Substation	-	Infrastructure Systems	Power Supply	Yes, FEMA	High	3	-	1	0
Orinoco Drive Commercial Area	Moderate	Economic	Downtown Center	No, Locally Significant	Medium	3	2.00	3	18
SC DPW Sewage Pumping Facility	Moderate	Infrastructure Systems	Wastewater	Yes, FEMA	High	3	3.00	4	36
Brightwaters Highway Department	-	Infrastructure Systems	Government and Administrative Services	No, Locally Significant	Medium	3	-	1	0
Wohseepee Park	-	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Medium	3	-	1	0



E. Glossary

Acronyms

- AARP:** American Association of Retired Persons
- ADA:** Americans with Disabilities Act
- AADT:** Annual Average Daily Traffic
- BID:** Business Improvement District
- BSBRA:** Bay Shore-Brightwaters Rescue Ambulance
- BSFD:** Bay Shore Fire Department
- CBA:** Cost-benefit analysis
- CBO:** Community Based Organization
- CDBG-DR:** Community Development Block Grant-Disaster Recovery
- CDP:** Census Designated Place
- CeHa:** Coastal Erosion Hazard Area
- CERT:** Community Emergency Response Team
- CFA:** Consolidated Funding Application
- CGLI:** Cleaner Greener Long Island Regional Sustainability Plan
- CHAS:** Comprehensive Housing Affordability Strategy
- CRS:** Community Rating System
- CZM:** Coastal Zone Management
- DPW:** Department of Public Works
- EAEP:** Emergency Action and Education Plan
- EMS:** Emergency Medical Services
- ESL:** English as a Second Language
- ESRI:** Environmental Systems Research Institute
- FAA:** Federal Aviation Administration



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- FCC:** Federal Communications Commission
- FIMP:** Fire Island to Montauk Point Reformulation Study
- FEMA:** Federal Emergency Management Agency
- FTA:** Federal Transit Administration
- FTE:** Full-time equivalent
- GIS:** Geographic Information Systems
- GCWMP:** Great Cove Watershed Management Plan
- GOSR:** Governor's Office of Storm Recovery
- HMGP:** Hazard Mitigation Grant Program
- HUD:** U.S. Department of Housing and Urban Development
- IT:** Information Technology
- LIJ:** North Shore – Long Island Jewish Health System
- LIREDC:** Long Island Regional Economic Development Council
- LIRR:** Long Island Rail Road
- LMI:** Low-Moderate Income
- LWRP:** Local Waterfront Revitalization Program
- MLS:** Multiple Listing Service
- NOAA:** National Oceanic and Atmospheric Administration
- NFIP:** National Flood Insurance Program
- NGO:** Non-governmental organization
- NYRCR:** NY Rising Community Reconstruction
- NYS DEC:** New York State Department of Environmental Conservation
- NYS DOS:** New York State Department of State
- NYS DOT:** New York State Department of Transportation
- OPWDD:** Office for People with Developmental Disabilities



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NYS OPRHP: New York State Office of Parks, Recreation, and Historic Preservation

RSF: Recovery Support Function

SART: State Agency Review Team

SEQRA: State Environmental Quality Review Act

SNAP: Supplemental Nutrition Assistance Program

USACE: U.S. Army Corps of Engineers

USDA: U.S. Department of Agriculture



Terms

Asset: Places or entities where economic, environmental and social functions of the Community occur.

Asset Inventory: A listing of the Community's social, economic, and natural resource assets that have been, or will be, affected by coastal or riverine hazards.

Backflow Preventer: A mechanical device used to prevent the reverse flow of water through the storm or sanitary sewer system.

Community Vision: The overall goal of the Community throughout the NYRCR planning process.

Culvert: A drain or pipe that allows water to flow beneath a road, sidewalk or railroad.

Catch Basin: A depressed area or structure into which surface water may drain off. This type of infrastructure is usually located at the point where a roadway gutter discharges into a sewer.

Exposure: Local landscape characteristics that tend to increase or decrease storm effects.

Geographic Scope: The planning area identified by the Community and State guidelines where assets are most at risk; where future construction or reconstruction of existing development should be encouraged or discouraged; or where key investment to improve the local economy can be instituted.

Hazard: The likelihood and magnitude of anticipated hazard events.

Need: Infrastructure and/or services that were damaged or rendered inoperable by Superstorm Sandy as well as methods and operations that failed to work during the storm event or experienced insufficient capacity to respond effectively.

Needs and Opportunities Assessment: Determining needs and opportunities to improve local economic growth and enhance resilience to future storms.

Opportunity: Resiliency benefits, whether economic, environmental, social or cultural, that may be achieved through the integration of new methods, procedures and materials into the normal course of rebuilding.

Outfall: Discharge point where a pipe, sewer or river empties into a bay, ocean or other waterbody (river, lake).

Public Engagement: Opportunities for public input and involvement at key milestones in the planning process.



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Resilience: The ability of a system to absorb impacts while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt.

Risk: The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes.

Risk Area: Geographic areas at risk from coastal hazards according to differences in the exposure of the landscape.

Risk Assessment: Assessing risk to key Community assets based on the three factors contributing to risk: hazard, exposure, and vulnerability.

Risk Assessment Tool: Evaluation of risk based on the formula: Hazard x Exposure x Vulnerability.

Risk Score: The result of the risk assessment tool evaluation.

Strategy: A specific way or ways to address the needs and realize opportunities presented by the committee.

Transit Oriented Development: A mixed-use residential and commercial area designed to maximize access to public transport, that may incorporate features to encourage transit ridership.

Vulnerability: The capacity of an asset to return to service after an event.



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Community Based Organizations (CBO) Inventory

Table 35. Community Based Organizations (CBO) Inventory		
Name	Address	Phone Number
Suffolk County Coalition Against Domestic Violence	Undisclosed	Undisclosed
ACLD Kramer Learning Center	1428 Fifth Avenue	631-665-1900
Habitat for Humanity	12 Westside Avenue	631-665-3271
Bay Shore Historical Society	22 Maple Avenue	631-665-1707
Islip Runaway Program YMCA	94 W. Main Street	631-665-1173
Help Project Samaritan, Inc.	12 Edwin Street	631-666-3763
Suburban Housing Development, Inc.	1360 Fifth Avenue	631-665-2866
Beacon House United Veterans	200 Bay Shore Road	631-969-9105
Blessed Hope Mission Church	1665 E. Third Avenue	631-951-4155
Long Island Housing Partnership, Inc.	20 Courtland Drive	631-581-0103
Gay & Lesbian Switchboard of Long Island	Undisclosed	631-665-3700
Great South Bay YMCA	200 W. Main Street	631-665-4255
Catholic Charities Community Service	12 Mechanicsville Road	631-968-8007
American Legion	102 E. Main Street	631-968-8868
Operation Homeless	93 E. Main Street	631-665-1059
South Shore Counseling	144 Fourth Avenue	631-968-6169
Alzheimer's Association	45 Park Avenue	631-820-8068
Long Island Gay/Lesbian Youth	34 Park Avenue	631-665-2300
Parientes of Suffolk	65 Park Avenue	631-665-0229
Constance Augustyn CSW	1766 Sunrise Highway	631-665-8685
Family Consultation Service	500 E. Main Street	631-665-2737
Beacom House	1362 Fifth Avenue	631-666-2144
Penates, Inc.	1377 Fifth Avenue	631-647-4086
Family Service League, Inc.	1444 Fifth Avenue	631-647-3100
Young Adult Institute	924 Hampshire Road	631-665-8801
Mercy First	1511 Potter Boulevard	631-666-8022
Jewish Board Family & Children	1511 Potter Boulevard	631-666-3891
Feingold Associates of US	1602 Brentwood Road	631-369-9341
Adelante Senior Nutrition Program	45 Pine Aire Drive	631-231-2049
Pronto	128 Pine Aire Drive	631-231-8290
Mercy First	556 Manatuck Boulevard (Brightwaters)	631-665-2616
St. Mary's Children & Family	556 Manatuck Boulevard (Brightwaters)	631-206-6500



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Table 35. Community Based Organizations (CBO) Inventory (Cont'd)

Name	Address	Phone Number
Islip Town Branch NAACP	81 Carleton Avenue	631-348-4781
Saint Patrick Hospitality Center	Montauk Highway	631-665-4911
Bay Shore Fire Department	195 Fifth Avenue	631-665-4227
Bay Shore –Brightwaters Rescue Ambulance, Inc.	911 Aletta Place	631-666-5600
Bay Shore Union Free School District	75 West Perkal Street	631-968-1100
Chamber of Commerce of Greater Bay Shore	102 E. Main Street	631-665-7003
LIJ Southside Hospital	301 E. Main Street	631-968-3000
Suffolk County Department of Fire, Rescue, & Emergency Services	100 Veterans Memorial Hwy.	631-853-5593
Suffolk County Department of Social Services	100 Veterans Memorial Hwy.	631-852-4900
Town of Islip Department of Public Safety, Office of Emergency Management	401 Main Street	631-224-5730
Greater Bay Shore Faith Based Organizations (Various)		

Source: Derived from ESRI data



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F. End Notes

Photo Credits: Photos contained in this document were taken by Jacobs or reprinted with permission from NYRCR Committee Members or others.

¹ Office of the Governor of the State of New York. *Governor Cuomo Announces Broad Series of Innovative Protections; Vice President Biden Credits Governor Cuomo's Storm Plan as A Model for Future Recovery Efforts*. January 7, 2014. <http://www.governor.ny.gov/press/01072013-cuomo-biden-future-recovery-efforts>

² Bay Shore Chamber of Commerce, *Welcome to the Bay Shore Area*, Bay Shore Brightwaters Library, Undated, Reference Department, Vertical File, # 11.

³ New York State Office of Mental Health. *Pilgrim Psychiatric Center*.

<https://www.omh.ny.gov/omhweb/facilities/pgpc/facility.htm>

⁴ Brett Senft. If You're Thinking of Living in: Bay Shore. *New York Times*. (April 12, 1992).

⁵ Bay Shore LI. The Bay Shore & Brightwaters Community Website. *About Bay Shore, NY*. <http://www.bayshoreli.com/about-bay-shore-ny/>

⁶ Suffolk County Department of Planning. *Shopping Centers and Central Business Districts, Suffolk County, New York. Table 12. Vacancy Rates in Suffolk County's Largest Downtown Areas: 1978, 1982, 1989, 1996, 2000*. July 2001. p. 35.

⁷ Town of Islip. *Consolidated Strategy and Plan Submission for Housing and Community Development Programs. Draft Annual Plan July 1, 2014–June 30, 2015*. p.53.

⁸ Long Island Index. *Retail Information for the Bay Shore Area*. <http://www.longislandindexmaps.org/>

⁹ Long Island Regional Planning Board. *Historical Population of Long Island Communities 1790 - 1980*. Decennial Census Data. August 1982. p.16.

¹⁰ Bay Shore – Brightwaters Rescue Ambulance, Inc. *BSBRA History*. <http://www.bsbra.org/history.html>

¹¹ U.S. Census Bureau: *State and County QuickFacts*. Data derived from Population Estimates, American Community Survey, Census of Population and Housing, County Business Patterns, Economic Census, Survey of Business Owners, Building Permits, Census of Governments

¹² New York State Department of Health. *Adult Care Facilities in Suffolk County: Atria Bay Shore*. https://www.health.ny.gov/facilities/adult_care/county/suffolk.htm

¹³ U.S. Department of Housing and Urban Development, Census Tracts 1460, 1472, 1473. <http://egis.hud.gov/cpdmaps/>

¹⁴ Town of Islip Community Development Agency. *Consolidated Strategy and Plan Submission for Housing and Community Development Programs*. May 15, 2014. <http://www.islipcda.org/Plans/Draft%20Annual%20Plan%206-30-15.pdf>

¹⁵ 4ward Planning, Inc. *Housing Characteristics Greater Bay Shore Plan Area, Suffolk County, New York, Draft*. October 2014.

¹⁶ HUD. *CHAS Data Query Tool, 2007-2011*.

¹⁷ USA Industries. *About Us*. <http://www.usaind.com/pages/about>

¹⁸ Newsday. *Bay Shore manufacturer to close, lay off 271 workers*. August 6, 2014. <http://www.newsday.com/business/bay-shore-manufacturer-to-close-lay-off-271-workers-1.8979948>

¹⁹ Greater Bay Shore Chamber of Commerce. *Bay Shore A Great Place To Do Business Where Success Is A Piece of Cake*.

²⁰ NOAA National Hurricane Center. *Tropical Cyclone Report Hurricane Sandy (AL182012) 22-29 October 2012*. p. 92.

²¹ NOAA National Hurricane Center. *Tropical Cyclone Report Hurricane Sandy (AL182012) 22-29 October 2012*. p. 92.

²² Bay Shore Fire Department. *BSFD Was Ready for Superstorm Sandy*.

<http://www.bayshorefd.org/LatestNewsStory.php?nSI=560137614>

²³ Town of Islip. *Parks At A Glance: Bay Shore Marina*.

<http://schoolsites.schoolworld.com/schools/townofislip/files/filesystem/Bay%20Shore%20Marina%20Park.pdf>

²⁴ Anthony D'Amico, Deputy Commissioner of Public Safety, Town of Islip. Memorandum via e-mail, June 27 2014.

²⁵ Ibid.

²⁶ Village of Brightwaters. *Minutes from Meeting of the Village Board of Trustees*. November 15, 2012.

²⁷ Ibid.

²⁸ Town of Islip. *The Effect of Hurricane Sandy on Islip Town Parks & Recreation: Recovery & Restoration for 2013*. pp. 11-13, 31.

²⁹ Ibid.



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- ³⁰ Suffolk County Department of Planning, *Land Available for Development and Population Analysis Western Suffolk County*, October 2009, pg. 44
- ³¹ Town of Islip and NYS Department of State, *Great Cove Watershed Study*, September 2012, pg. 3-1
- ³² Suffolk County Department of Planning. *Shopping Centers and Central Business Districts, Suffolk County, New York*. July 2001, p. 35.
- ³³ Long Island Regional Planning Council, *Regional Comprehensive Sustainability Plan— Sustainable Strategies for Long Island 2035*, December 2010, pg. 7
- ³⁴ U.S. Army Corps of Engineers
<http://www.nan.usace.army.mil/Missions/CivilWorks/ProjectsInNewYork/FireIslandtoMontaukPointReformulationStudy/FIMP/About.aspx>
- ³⁵ U.S. Army Corps of Engineers
<http://www.nan.usace.army.mil/Missions/CivilWorks/ProjectsInNewYork/FireIslandtoMontaukPointReformulationStudy.aspx>
- ³⁶ South Shore Estuary Reserve Council, *South Shore Estuary Reserve Comprehensive Management Plan*, pg.ix
- ³⁷ Cleaner Greener Consortium of Long Island; Town of North Hempstead. *Cleaner Greener Long Island Regional Sustainability Plan*. May 2013. p. 5.
- ³⁸ Long Island Regional Planning Council. *Long Island 2035 Visioning Initiative Final Report*. December 2009. p. 19.
- ³⁹ Ibid. p.21.
- ⁴⁰ Critical facilities as defined by FEMA may include: emergency service facilities (hospitals/medical facilities), police and fire stations, emergency operations centers, public works facilities, shelters, schools, and other uses that house special needs populations (FEMA Mitigation Planning Regulations, 44 CFR, Part 201).
- ⁴¹ New York Rising Community Reconstruction Program. *The Process for Inventory, Risk Assessment in Coastal Areas and the Assessment of the Effectiveness of Flood Reduction Actions in Riverine Areas*. Prepared by a multi-firm working group.
- ⁴² Assets not in the extreme, high, and moderate risk assessment areas are noted as not applicable (N/A.)
- ⁴³ Local Multi-Hazard Mitigation Guidance, FEMA, July 1, 2008, pp. 42-43. Based on authority in FEMA Mitigation Planning Regulations, 44 CFR, Part 201: "Critical Facilities are essential to the health and welfare of the whole population and are especially important following hazard events. For purposes of this mitigation planning guidance, critical facilities may include emergency service facilities such as hospitals and other medical facilities, jails and juvenile detention centers, police and fire stations, emergency operations centers, public works facilities, evacuation shelters, schools, and other uses that house special needs populations.
- ⁴⁴ Governor's Office of Storm Recovery, *Home Page*, <http://stormrecovery.ny.gov/>
- ⁴⁵ Federal Emergency Management Agency, *National Disaster Recovery Framework (September 2011)*, at: <http://www.fema.gov/national-disaster-recovery-framework>
- ⁴⁶ Long Island Area Scanning Frequencies. *Suffolk County Public Service Frequencies*.
<http://www.fordyce.org/scanning/frequencies/suffolk.htm#A1>
- ⁴⁷ Fire Island Ferries, Inc. <http://www.fireislandferries.com/schedules>
- ⁴⁸ U.S. News and World Report – Health. <http://health.usnews.com/best-hospitals/area/ny/southside-hospital-6210280/details>
- ⁴⁹ Ibid.
- ⁵⁰ NY Rising Community Reconstruction Program. *Cost-Benefit Evaluation*. Prepared by a Multi-Firm Working Group. October 2014.
- ⁵¹ New York Rising Community Reconstruction Program. *NYRCR Program Guidance to Firms, Project Evaluation, December 30, 2013*. p.3.
- ⁵² These costs could relate to reduced emergency and recovery expenditures in the future less implementation costs for the life of the project.
- ⁵³ Socially vulnerable population may be derived from the following criteria: poverty/low income, immigrant status, education level, institutionalization, renter-occupied household status, single senior-citizen household status.
- ⁵⁴ The FTE figures are general estimates. The number of FTEs is a function of total project cost to be expended. All job estimates assume labor at 50% of total project costs, divided by \$40,000 per FTE job. The income figures, provided by the U.S. Bureau of Labor Statistics for Full Time Equivalent jobs are used for all project profiles. U.S. Bureau of Labor Statistics. *Occupational Employment Statistics, May 2012 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates Nassau-Suffolk, NY Metropolitan Division*. This source for Full Time Equivalent jobs is used for all project profiles.



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⁵⁵ Suffolk County Department of Planning, *Subsidized Apartment Complexes of Ten or More Units- Suffolk County, New York, June 2013*. <http://www.suffolkcountyny.gov/Portals/0/planning/Research/SaptS2013.pdf>

⁵⁶ It is noted that Bay Shore is classified as a Low Moderate Income (LMI) area by the U.S. Census Bureau. This classification applies for Census Tracts with over 50% of the population earning less than 80% of the median area income. For 2014, this would equal a maximum income for a family of four of \$75,650. Source: Town of Islip Community Development Agency. *Consolidated Strategy and Plan Submission for Housing and Community Development Programs*. May 15, 2014, <http://www.islipcda.org/Plans/Draft%20Annual%20Plan%206-30-15.pdf>

⁵⁷ <http://www.city-data.com/zips/11706.html#ixzz3FqmeAbQ7>

⁵⁸ The FTE figures are general estimates. The number of FTEs is a function of total project cost to be expended. All job estimates assume labor at 50% of total project costs, divided by \$40,000 per FTE job. The income figures, provided by the U.S. Bureau of Labor Statistics for Full Time Equivalent jobs are used for all project profiles. U.S. Bureau of Labor Statistics. Occupational Employment Statistics, *May 2012 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates Nassau-Suffolk, NY Metropolitan Division*. This source for Full Time Equivalent jobs is used for all project profiles.

⁵⁹ Ibid.

⁶⁰ New York State Department of Transportation. *New York State Transportation Traffic Data Viewer*. <https://www.dot.ny.gov/divisions/engineering/applications/traffic-data-viewer>

⁶¹ Long Island Regional Economic Development Council. *The Strategic Economic Development Plan for Long Island-2013 Update*. August 2013, pp.39-40; 52-53.

⁶² Long Island South Shore Estuary Reserve Comprehensive Management Plan, LI South Shore Estuary Management Reserve Council, 2001. p. vi.

⁶³ E-mail communication between Jacobs and Brian Butler, Chief of Department, Bay Shore Fire Department, October 20, 2014.

⁶⁴ U.S. Census Bureau, 2012 ZIP Code Business Patterns, NAICS; Village of Brightwaters 11718 ZIP Code: 98 businesses; Bay Shore/West Bay Shore 11706 ZIP Code: 1,608 businesses

⁶⁵ The FTE figures are general estimates. The number of FTEs is a function of total project cost to be expended. All job estimates assume labor at 50% of total project costs, divided by \$40,000 per FTE job. The income figures, provided by the U.S. Bureau of Labor Statistics for Full Time Equivalent jobs are used for all project profiles. U.S. Bureau of Labor Statistics. Occupational Employment Statistics, *May 2012 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates Nassau-Suffolk, NY Metropolitan Division*. This source for Full Time Equivalent jobs is used for all project profiles.

⁶⁶ InfoFree.com

⁶⁷ Ibid.

⁶⁸ Bay Shore Fire Dist. *List of Wants and Needs for Proposed Bond Issue*. September 2, 2014; Feld Fire. *Honda 11hp High Volume Floating Pump*. http://www.feldfire.com/Honda-11hp-High-Volume-Floating-Pump_p_367.html?utm_source=GoogleShopping&utm_medium=organic&gclid=CLyJ-rXmpMECFcNQ7AoduScA3A; NRS, *Extreme SAR Drysuit* <http://www.rocknrescue.com/acatalog/NRS-Extreme-SAR-Drysuit.html>; All Hands Fire Equipment. *Profile Professional Shallow Water V Aluminum Boat*. <http://www.allhandsfire.com/AB-Inflatables-Aluminum-A12S-Boat>.

⁶⁹ Long Island Regional Economic Development Council. *The Strategic Economic Development Plan for Long Island-2014 Update*. August 2014, p.2.

⁷⁰ The FTE figures are general estimates. The number of FTEs is a function of total project cost to be expended. All job estimates assume labor at 50% of total project costs, divided by \$40,000 per FTE job. The income figures, provided by the U.S. Bureau of Labor Statistics for Full Time Equivalent jobs are used for all project profiles. U.S. Bureau of Labor Statistics. Occupational Employment Statistics, *May 2012 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates Nassau-Suffolk, NY Metropolitan Division*. This source for Full Time Equivalent jobs is used for all project profiles.

⁷¹ Ibid.

⁷² Ibid.

⁷³ New York State Department of Transportation. *New York State Transportation Traffic Data Viewer*. <https://www.dot.ny.gov/divisions/engineering/applications/traffic-data-viewer>

⁷⁴ Ibid.

⁷⁵ Long Island Regional Economic Development Council. *The Strategic Economic Development Plan for Long Island-2013 Update*. August 2013, pp.39-40; 52-53.

⁷⁶ Long Island South Shore Estuary Reserve Comprehensive Management Plan, LI South Shore Estuary Management Reserve Council, 2001. p. vi.



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⁷⁷ The FTE figures are general estimates. The number of FTEs is a function of total project cost to be expended. All job estimates assume labor at 50% of total project costs, divided by \$40,000 per FTE job. The income figures, provided by the U.S. Bureau of Labor Statistics for Full Time Equivalent jobs are used for all project profiles. U.S. Bureau of Labor Statistics. Occupational Employment Statistics, *May 2012 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates Nassau-Suffolk, NY Metropolitan Division*. This source for Full Time Equivalent jobs is used for all project profiles.

⁷⁸ Long Island Regional Economic Development Council. *The Strategic Economic Development Plan for Long Island-2013 Update*. August 2013, pp.39-40; 52-53.

⁷⁹ Long Island South Shore Estuary Reserve Comprehensive Management Plan, LI South Shore Estuary Management Reserve Council, 2001. p. vi.

⁸⁰ Town of Islip, New York State Department of State. *Great Cove Watershed Management Plan*. September 2012. pp. 1-4, 1-5.

⁸¹ The FTE figures are general estimates. The number of FTEs is a function of total project cost to be expended. All job estimates assume labor at 50% of total project costs, divided by \$40,000 per FTE job. The income figures, provided by the U.S. Bureau of Labor Statistics for Full Time Equivalent jobs are used for all project profiles. U.S. Bureau of Labor Statistics. Occupational Employment Statistics, *May 2012 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates Nassau-Suffolk, NY Metropolitan Division*. This source for Full Time Equivalent jobs is used for all project profiles.

⁸² Long Island Regional Economic Development Council. *The Strategic Economic Development Plan for Long Island-2014 Update*. August 2014, p.2.

⁸³ Vulnerability criteria was classified based on State guidance as follows:

- **Insignificant (1): limited interruption** in service/short-term reduction in service
- **Minor (2):** service **loss for up to 1 week**/longer-term reduction in service
- **Moderate (3):** service loss of **more than 1 week up to 1 month**
- **Significant (4):** service loss of more than 1 month/permanent reduction in capacity
- **Major (5): permanent loss** of asset/service.