





*This document was developed by the NY Rising Community Reconstruction (NYRCR) Village of Babylon/West Babylon Planning Committee as part of the NYRCR Program within the Governor’s Office of Storm Recovery. The NYRCR Program is supported by New York State (NYS) Homes and Community Renewal, NYS Department of State, and NYS Department of Transportation. The document was prepared by the following consulting firms:*

- *Jacobs*
- *Cameron Engineering & Associates, LLP*

**Table 1: Committee Member List**

<b>Committee Role</b>	<b>Name</b>
Co-Chair	Ray Accettella
Co-Chair	Dominic Bencivenga*
Member	Mary Adams
Member	Tony Davida*
Member	Theresa DiPietto-Roesler
Municipal Representative	Charles “Skip” Gardner*
Member	Scott Glenn
Municipal Representative	Richard Groh*
Member	Ellen McArdle
Municipal Representative	Claire McKeon*
Member	Judy Skillen
Member	Kim Skillen
Member	Jon Taylor

**\*Non-voting member**



CAMERON ENGINEERING  
& ASSOCIATES, LLP



# Foreword

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## Introduction

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

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

## Program Overview

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

One hundred and two storm-affected localities across the State were originally designated to participate in the NYRCR Program. The State has allocated each locality between \$3 million and \$25 million to implement eligible projects identified in the NYRCR Plan. The funding for these projects is provided through the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) program.<sup>1</sup>

Forty-five NYRCR Communities, each comprising one or more of the 102 localities, were created and led by a NYRCR Planning Committee composed of local residents, business owners, and civic leaders.

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<sup>1</sup> Five of the 102 localities in the program — Niagara, Herkimer, Oneida, Madison, and Montgomery Counties — are not funded through the CDBG-DR program.



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

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

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

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

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



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

### The NYRCR Plan

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

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

NYRCR Village of Babylon/West Babylon is eligible for up to nearly \$10.2 million in CDBG-DR implementation funds.<sup>2</sup>

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

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<sup>2</sup> The following localities' allocations comprise the NYRCR Community's total allocation: Village of Babylon - \$6.2 million; West Babylon - \$3.9 million.

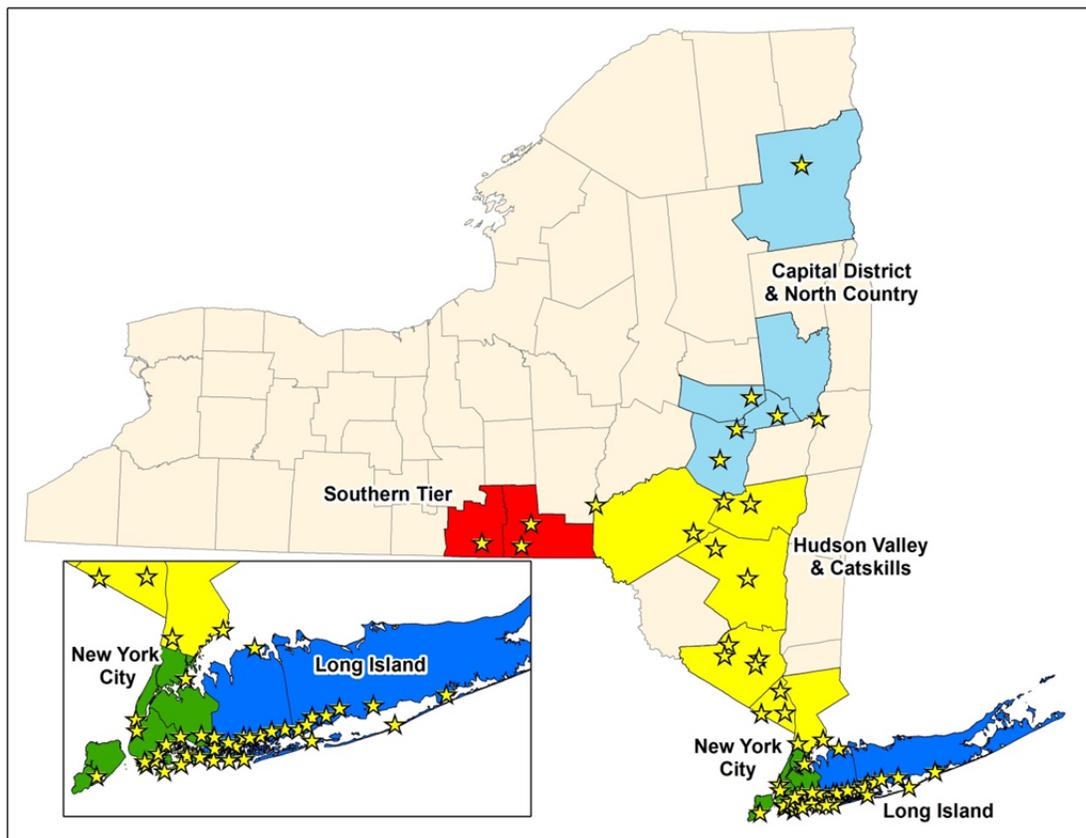


## Village of Babylon/West Babylon NY Rising Community Reconstruction Plan

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

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

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



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<sup>3</sup> Note: map includes those NYRCR Communities funded through the CDBG-DR program, including the NYRCR Communities announced in January 2014.



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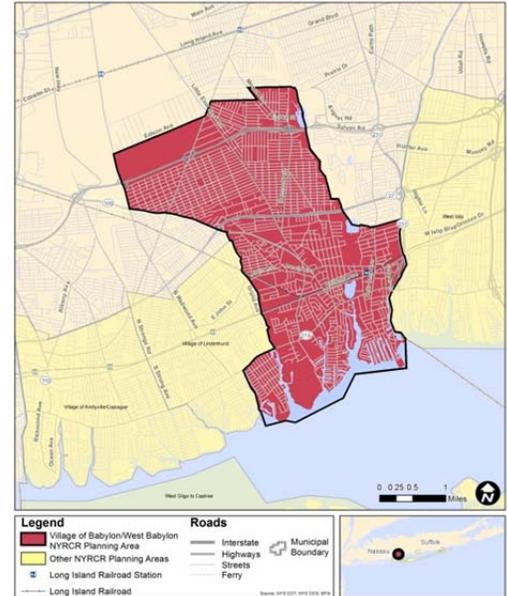
# Executive Summary

## Overview of NY Rising Community Reconstruction Community: Village of Babylon/West Babylon

NY Rising Community Reconstruction (NYRCR) Village of Babylon/West Babylon Community (Community) is one of eight NYRCR Communities identified within Suffolk County. The NYRCR Village of Babylon/West Babylon Community comprises the hamlet of West Babylon, a census-designated place (CDP) within the Town of Babylon, and the Incorporated Village of Babylon. The West Babylon CDP also includes Venetian Shores, a small peninsula located in the southwest corner of the Town. Although Venetian Shores is within the boundaries of the West Babylon CDP, it is served by the Lindenhurst School District and Lindenhurst Fire Department. Residents in this area also have a Lindenhurst address and zip code. In addition to Lindenhurst to the west, the Community is also bordered by North Babylon and Wyandanch to the north, West Islip to the east and the Great South Bay to the south. Up to nearly \$10.2 million has been allocated for resiliency projects within this Community.

The Babylon-West Babylon area owes its growth and success in large measure to the railroad and the waterfront. The Village of Babylon was incorporated in 1893 and is the oldest village within the Town of Babylon. Its bustling and walkable downtown district is unique to Suffolk County, making the Village a well-known regional destination. Both Babylon and West Babylon also feature waterfront parks, local marinas, historic structures, and significant amounts of preserved open space. The Long Island Rail Road (LIRR) connects points east (e.g., Montauk) and west (e.g., New York City), providing service to local residents and visitors alike. The Community’s accessibility to New York City played a large role in driving post-war growth and development in both the Village of Babylon and West Babylon and continues to attract new residents to the area. West Babylon is currently the most populous hamlet (estimated population: 43,213) within the Town of Babylon. In comparison, the Village of Babylon is much smaller, with a population of 12,166.

The Village of Babylon and West Babylon were particularly hard hit by Superstorm Sandy, with structures located along the Great South Bay and along canals experiencing the worst damage. The impact of the storm was devastating to both communities.



**Emergency response, Babylon Fire Department**

*(Photo Credit: TJ McGurk, Babylon Fire Department)*



Many dwellings and businesses located along the shore lost power and communications. Outages persisted for an extended period of time during the recovery process as Long Island faced one of the largest storm-related outages on record. Many homes and commercial buildings were inundated with a tidal surge of approximately six feet that extended well into the communities, reaching north of Montauk Highway in many locations.

Fires caused by eroded electrical wires destroyed property, posed safety concerns and strained an already taxed crew of emergency responders.

Rescue operations continued throughout the night while attempts were made to evacuate residents and provide vital services to those in need. Nursing homes along the waterfront presented significant challenges as access for vehicles and equipment was restricted by floodwaters. The NYRCR Village of Babylon/West Babylon Community was and remains fortunate to have such dedicated and experienced first responders and emergency service personnel.

When the winds finally abated and the waters calmed, residents were confronted with a level of destruction most had never experienced. Many streets remained partially flooded over the next few days as the water slowly receded into the Great South Bay. Roads were obstructed, traffic signals were not functioning, and vehicles and boats that had been destroyed during the storm were stranded in place. Homes were completely destroyed and rendered unlivable. Many were condemned, leaving residents without a home and away from the support of their community. Overall, 2,124 homes in the Village of Babylon and West Babylon were substantially damaged, with 1,990 sustaining “heavy” damage (>50%) or “strong” damage (20% to 50%).

The Community also faced a serious problem with floating hazards and debris. Residential fuel oil tanks used for home heating and boats stored at the various local marinas floated away as the floodwaters rose. The volume and mass of storm-carried debris caused damage to other structures and obstructed roadways and access routes. Without natural gas service in many areas, residents typically rely on outdoor fuel oil tanks to provide heating fuel. Many oil tanks ruptured, leaking their contents and contaminating the water and soil. Just five days after the storm, the Town of Babylon Department of Environmental Control (TOB DEC) recorded over 300 oil spills in the Town.



**Local recovery center**

*(Photo Credit: Theresa DiPietto-Roesler & Kim Skillen)*



These documented effects, combined with the first-hand experiences shared by residents at multiple well-attended public engagement events led to the identification of several critical issues facing the Community. These issues served to define needs, opportunities, strategies, and eventually projects that would help make the Community more resilient and sustainable. Critical issues include:

- Ensuring that municipalities and first responders, including fire departments, have the necessary resources to prepare for and protect the public, property, and the natural environment during and after disasters;
- Improving and strengthening communication systems before, during and after disasters;
- Establishing a service to identify temporary housing following major storm events;
- Increasing public education on disaster preparedness;
- Improving emergency evacuation preparedness and procedures;
- Implementing innovative technology to strengthen the resiliency of key assets and create redundancy in electrical power supply, i.e. microgrid system;
- Managing stormwater and water flow through the numerous lakes, ponds and stream tributaries within the Community; and
- Improving shoreline protection/resiliency.
- Improving coordination with other emergency service providers, municipalities and key institutional entities;
- Addressing storm surge on Long Island in a regional context;
- Hardening key utility and transportation infrastructure to reduce future vulnerability; and
- Ensuring continued operation of the Bergen Point Wastewater Treatment Plant.

### ***NYRCR Program: A Community-Driven Process***

The NYRCR Village of Babylon/West Babylon Planning Committee developed the following Vision Statement to guide the entire planning process and ensure that the recommended actions – included in the NYRCR Babylon/West Babylon Plan – address the critical issues they identified:



***Shoreline along the Great South Bay***

*(Photo Credit: Consultant Team)*



***Waterfront commercial and recreational facilities***

*(Photo Credit: Consultant Team)*



*The residents of Babylon Village, West Babylon, and Venetian Shores are committed to developing stronger, more resilient communities by implementing innovative infrastructure projects, land use policies, “green” technology, and emergency management procedures to better prepare for natural disasters and to preserve the region’s historic and nautical character and quality of life. We will accomplish those goals through sustained economic investment, improved communication, and strong educational outreach, which will provide an ongoing example of what can be achieved when communities come together with a common purpose.*

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

The Public Engagement Process did not end with the development of the Vision Statement. In keeping with Governor Cuomo’s emphasis on bottom-up planning, members of the Community were involved in each step of the NYRCR Program. The NYRCR Committee was composed of residents who could speak directly from experience of the character of the Community, its needs, and strengths in good times and bad. As of March 26, 2014, ten Committee meetings have been held. All Committee meetings were open to the public, with meeting dates and times posted on the NYRCR website ([www.stormrecovery.ny.gov/nyrcr](http://www.stormrecovery.ny.gov/nyrcr)).

The Community at-large was invited to take part in the NYRCR Program through a variety of methods. Their feedback was reviewed by the Committee and incorporated into the decision-making that informed the development of this Plan. Engagement activities included several in-person and web-based opportunities for participation:

- The Consultant Team hosted three open-house style events during the development of the plan and will host a fourth to present this final document;
- Residents were encouraged to complete a web-based survey to gauge public opinion on the Proposed Projects in conjunction with Public Engagement Event 3;
- Younger members of the community were invited to participate in a web-based “Next Generation” survey to gather feedback on proposed projects that would likely affect their futures in the Community;



**Venetian Shores Park**

*(Photo Credit: Consultant Team)*



**Neighbors Supporting Neighbors  
Community Event**

*(Photo Credit: Theresa DiPietto-Roesler & Kim Skillen)*



## Village of Babylon/West Babylon NY Rising Community Reconstruction Plan

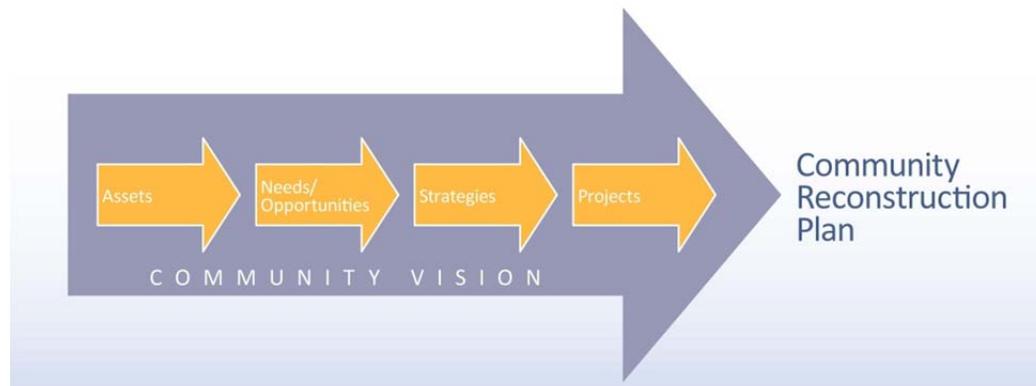
- The NYRCR Village of Babylon/West Babylon Community website (<http://stormrecovery.ny.gov/nycrcr/community/village-babylon-and-west-babylon>) served as a repository for downloadable versions of all public information and event notifications. The website includes an area to accept public comment;
- Planning information was disseminated through local print media to keep the Community informed and to respond to media inquiries;
- E-mail comments and requests for information could be sent to the State's e-mail address at: [info@stormrecovery.ny.gov](mailto:info@stormrecovery.ny.gov); and
- Comment forms were available at Committee meetings and public engagement events and on the State's website to provide an opportunity for the public to contribute their feedback, which were then passed along to the Committee.



**Village of Babylon Municipal Dock**

*(Photo Credit: Consultant Team)*

### *NYRCR Final Plan: A Blueprint for Resiliency*



An asset risk assessment was conducted for the Community to identify those resources, both built and natural, which are critical to the safety, resiliency, and character of the Community and establish the potential for future damage to the assets (risk). 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.

Projects are the path to executing the strategies and meeting the Community's need for resiliency. Three tiers of projects were identified: Proposed Projects, Featured Projects, and Additional Resiliency Recommendations. Proposed Projects are projects that are under consideration for funding with the committed value of up to nearly \$10.2 million. It is important to note that there is no priority order or ranking of projects aside from the project tier, which is derived solely from the requirements of the Community Development Block Grant – Disaster Recovery (CDBG-DR) program established by the Federal government. The following table presents all Proposed Projects by Strategy:



## Village of Babylon/West Babylon NY Rising Community Reconstruction Plan

NYRCR Village of Babylon/West Babylon Resiliency Projects		
Strategy	Project Name	Project Category
Strengthen And Harden Electrical Infrastructure To Protect Key Assets Within The Downtown Village Commercial District	Microgrid Engineering Feasibility Study	Proposed
Adequately Equip Municipalities and First Responders for Natural Disasters	Village of Babylon Emergency Response and Rescue Equipment and Fixed Generators	Proposed
	Village of Babylon Department of Public Works Fixed Generator	Proposed
	West Babylon Fire Department Emergency Response and Rescue Equipment	Proposed
	Town of Babylon Division of Fire Prevention Emergency Response and Rescue Equipment	Proposed
	Cedar Street Property Acquisition and Construction of Emergency Equipment Garage – Babylon Fire Department	Proposed
	West Babylon Fire Department EMS Facility	Proposed
Integrate “Green” and “Gray” Infrastructure to Holistically Manage Water Flow within the Local Watershed	Carlls River Tributary / Watershed Project (Phase I)	Proposed
	Town-wide and Village-wide Coastal Outfall Backflow Infrastructure	Proposed
Repair and Enhance Critical Shoreline Infrastructure	Araca Road (Dalton Point) Shoreline Stabilization	Proposed
	Little East Neck Road Shoreline Stabilization	Proposed
	Venetian Shores Park Shoreline Engineering Study and Pilot Constructed Dune Project	Proposed
Create Hamlet Identity for West Babylon	West Babylon Hamlet Open Space Acquisition/Stormwater Engineering Study and Pilot Green Infrastructure Project	Proposed
Strengthen Community Resiliency through the Implementation of Innovative Infrastructure Improvements	Complete Streets Engineering Study and Pilot Green Infrastructure Project	Proposed
Improve the Reliability of Communication Systems for Natural Disasters	Babylon Central Alarm – Upgrade to Communications Infrastructure	Proposed



## Section 1: Community Overview

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*Argyle Lake, Village of Babylon<sup>1</sup>*



There is no place on Long Island like. . .

*The NYRCR Village of Babylon/West Babylon Community (Community) comprises the hamlet of West Babylon, a census-designated place (CDP) within the Town of Babylon, and the Incorporated Village of Babylon. The West Babylon CDP also includes Venetian Shores, a small peninsula located in the southwest corner of the Town. Although Venetian Shores is within the boundaries of the West Babylon CDP, it is served by the Lindenhurst School District and Lindenhurst Fire Department. Residents in this area also have a Lindenhurst address and zip code. In addition to Lindenhurst to the west, the Community is also bordered by North Babylon and Wyandanch to the north, West Islip to the east and the Great South Bay to the south.*

**Argyle Lake, Village of Babylon**



**Great South Bay residential canal, post-Sandy**  
*(Photo Credit: Rich Groh, Town of Babylon Department of Environmental Control [TOB DEC])*



**Main Street, Village of Babylon**

We know that a lot of villages and hamlets would be happy to add their name to the end of that sentence. But the Village of Babylon and its sister hamlet of West Babylon really are one of a kind. We have a lot of pride, but this is not just civic boosterism. A lot of places have some of what we have—a long and strong tradition of volunteerism, including well-trained emergency first responders, an accomplished and attentive local government, a history dating back to the 1600s, architecturally significant homes, a picturesque but “working” waterfront for boating, fishing and walking, a park and pond that are magnets for bridal photographers, a commuter rail station in a charming, vibrant downtown with dozens of shops and restaurants. But how many other communities have all these amenities and qualities? How many can legitimately claim to be the poster-child for transit-oriented, Smart Growth living that is so important to reviving all of Long Island?



Then along came Sandy, and nothing was quite the same.



**Town post-Sandy debris stockpile, Town of Babylon**  
(Photo Credit: Rich Groh, TOB DEC)

“Babylon is a unique South Shore treasure, and it was a helpless feeling as we all watched Superstorm Sandy bearing down on our Village. . .” said Jon Taylor, president of the Village Chamber of Commerce and a member of the NYRCR Village of Babylon/West Babylon Planning Committee (Committee). “Helplessness, anxiety, and fear.”

But many people just did not believe they were vulnerable—especially after Sandy had been downgraded from a hurricane. “When our crews went to hand out mandatory evacuation orders, they were told the same thing many times,” said Ellen McArdle, Secretary of the West Babylon Fire District. “You people made me leave for Irene. We were never in any danger and the only damage we had was from vandals and looters. I’m not leaving this time!” And that, of course, was a big mistake—one of the first of many lessons.

Sandy swept into Babylon and West Babylon with a savagery unseen in generations, if ever. Tides rose faster and more furiously than anyone expected, far higher than during Irene the year before and even during Gloria three decades before that. Houses and businesses within blocks of our heavily developed shore were swamped, some swept off foundations, and some completely flattened. Boats at their moorings and even in storage were tossed atop each other like toys in a toy chest. Oil tanks and cars floated away, spewing oil and other fluids into a polluted torrent in which many stunned residents—having ignored evacuation orders—found themselves wading up to their necks. And then, through what seemed like an endless night of wailing sirens and flashing lights, we could hear the hissing and popping of fires started by short circuits and sometimes fueled by leaking gas.

*“In the days after the storm, our crews spent an enormous amount of time cutting down trees to open roads for emergency vehicles and helping residents trapped by fallen trees. We set up our firehouse to disburse clothing, food, toiletries, school supplies, cleaning supplies and gift cards for community members who needed of assistance. We also dispatched trucks filled with supplies to people who had no way to get to us. This allowed us to see first-hand the despair, confusion and devastation that these storm victims were experiencing...”*

*--Ellen McArdle,  
Fire District Secretary,  
West Babylon Fire District*



***Emergency response***  
*(Photo Credit: TJ McGurk, Babylon Fire Department)*

“Maybe we had taken our Village and our lives for granted—the beauty of the bay and beach, the small town ease where you can sail your boat and an hour later you can be in Manhattan,” said Kim Skillen, a fourth generation West Babylonian and member of the Committee. “Nobody had seen anything like this, and we weren’t ready for it.”

Even our well-trained firefighters were not prepared or fully equipped. “Many people expressed their heartfelt thanks to our members for the danger they put themselves in while coming to their aid,” said Mrs. McArdle of the West Babylon Fire District. “In our after-Sandy evaluation, however, our district realized that we were, unknowingly, inadequately prepared for a storm of this nature. While we were lucky enough to borrow rowboats and a zodiac from other agencies, we realized that the . . . Fire Department needs a better supply of rescue and recovery equipment as part of our permanent inventory.”

And the West Babylon Fire Department was hardly alone. As we lived through the trauma of the storm and its aftermath, even before we have taken this painstaking review of our needs and opportunities, members of the Babylon and West Babylon communities were reminded—or awakened—to how much we must do to prepare for the next Big One and the one after that. As Governor Cuomo has said repeatedly in pushing all our communities to take control of the process of recovery and resiliency, it is not a matter of “if” but “when” the next disastrous storm will strike. And it may be soon.



*"The NY Rising Community Reconstruction Program has given us the opportunity to reflect on the vulnerabilities and strengths of our community. As a result we have taken pause to give real thought as to where do we want to see our community in the near and distant future. The storm taught us that with the beauty of the shoreline also comes vulnerability...."*

*--Kim Skillen, Executive Director Neighbors Supporting Neighbors,  
NYRCR Committee Member*

Sturdier equipment to make our first-responders even more effective—and safer for their own families—is only a start. As we detail in the project proposals elsewhere in this report, we need better ways for them to communicate with us and each other, and especially with our elderly, disabled,

and other vulnerable people. We need up-to-date plans with public education to insure that every citizen knows his role and responsibilities in an emergency. We need to provide more logistical assistance and other support for those devoting themselves to helping their neighbors. We need a place within the Community for people to go for a night's sleep, a hot meal, a charge for their phone or computer. We especially need one near the water, south of Montauk Highway where the worst flood damage was and will be in the future. Once the immediate emergency had passed, we must be able to locate temporary but longer-term housing opportunities for families who have lost their homes and cannot repair them right away. And when people are ready and able to rebuild, we must ease their task (as our Town and Village have begun to do) with streamlined and sensible building codes that, at the same time, encourage "greener," higher and sturdier structures.

But being prepared for a disaster does not necessarily mean being protected or resilient. We learned that we must do more—in much bigger and yes, sometimes costlier ways—to minimize the potential for tides to surge dangerously up through our creeks, canals, and storm sewers. We need to expand the capability of storm sewers, outfall pipes and other flood mitigation infrastructure. We must invest in the protection of regional assets like Bergen Point Wastewater Treatment Plant, which services the sewers that allow Babylon to build densely yet soundly. The Plant came dangerously close to flooding, which could have been an environmental disaster as well as an inconvenience for tens of thousands of people already burdened by other service disruptions. And while we are thinking regionally, we must make sure that our plans sync up with those in surrounding communities.

Protecting against flooding does not always mean laying pipe and pouring concrete. That is why we are proposing "green infrastructure" projects, like "stormwater wetlands" by the Carlls River Tributary near Elda Lake, and bioswales and "rain gardens" on property to be acquired near Bergen Point. We know we must pay more attention to protecting our environment so it can protect us. And that may mean protecting more land from development and strengthening our shorelines, especially wetlands, to be our first line of defense.



And while we are planning a healthier, more sustainable community—something we thought we had already done a pretty good job of—we need to look for ways to strengthen our economy. The Village of Babylon is iconic, a destination for people outside the area. West Babylon needs to create an identity and amenities that will encourage

visits and investment, especially along the Montauk Highway corridor. We also need to do more to attract eco-friendly tourism, to make more of our natural and historical assets.

Yet perhaps the most important characteristic of the NYRCR Village of Babylon/West Babylon Community is the continued strength and selflessness demonstrated by residents in the wake of Superstorm Sandy. Businesses, local civic associations, community organizations and individuals mobilized to provide necessities and support services both immediately following the storm and throughout the recovery process. Despite widespread community devastation, Babylon and West Babylon residents were committed to helping their neighbors and restoring the community as quickly as possible.

In reality, the lessons from Sandy were not all about fixing or strengthening or changing our practices and perceptions. Sandy reminded us of how special we are as a community. We saw so many people selflessly step up and pitch in to help their neighbors, sometimes putting their own lives at risk. Every organization, from our American Legion, to the Babylon Village Chamber of Commerce, to every religious institution in the area, contributed. “This really was a Village that pulled together,” said Bruce Humenik, chairman of the Babylon Village Zoning Board, who saw his boat tossed about like pick-up sticks. “People you never saw before pitching in to help their neighbors or just strangers in trouble.” And many groups that sprang up out of an impulse to help those less fortunate in the storm, such as Neighbors Supporting Neighbors and Babylon Helps, have stayed together to continue the work. And a lot of work remains to be done. Too many of our friends have not been made whole, their houses still empty of life.

Most gratifying was the dedication and determination of our children. School, religious, scouting, and athletic groups all raised funds and aided relief efforts. Kids, some of them quite young, just showed up with their parents to work at relief centers. “It made me feel bad that people were losing their houses and didn’t have anything,” said Mackenzie Johnston, an 11-year-old West Babylonian who is almost a legend for her energy, enthusiasm, and inventiveness. “I wanted to help them.” And so she did, helping to unload trucks alongside bigger kids and grownups, and finding coloring books and crayons to distract smaller kids so their parents could attend aid

*“The impact to my community is still evident. Homes are being lifted, others have been abandoned, and for sale signs have never been more evident. Our community resembled a war zone a little over a year ago. We cried at the sight of the devastation but the one thing that never wavered was our commitment to one another, neighbor to neighbor, stranger to stranger; we all have one thing in common; our resiliency...”*

*Claire McKeon, NYRCR Municipal Representative,  
Venetian Shores*



meetings. And more than 500 days after Sandy, Mackenzie and so many others, young and old alike are still on the front lines.

Volunteers can accomplish a lot, more than any of us imagined before Sandy changed the way we see everything in Babylon and West Babylon. Even if we were the wealthiest of communities—and we are not—our major infrastructure and equipment needs can only be met with the assistance of Federal, State and regional governments. As a small Village and an unincorporated hamlet, we know that huge infrastructure projects are beyond our ability to plan and finance on our own. That is not a situation unique to our Community, nor is it a slap at our local officials. Babylon Village, Babylon Town, school, and fire districts have performed well on our behalf. The work of this Committee has been to help to identify and recommend critical resiliency actions for close

consideration as resources become available.

That is one of the reasons we feel so positively about the New York Rising Community Reconstruction Program and the work of so many people who participated in the process set in motion by Governor Cuomo. Because all sectors of the Babylon Village and West Babylon were involved, and we were able to draw upon the expertise of the NYRCR Consultant Team and State, the process produced what we believe to be a sound and realistic plan for recovery and resiliency. Perhaps more importantly for the long haul, it also offered us a planning forum which recognized and respected our experiences, expertise, and preferences and that empowered people and promoted constructive dialogue.



***Neighbors Supporting Neighbors event donated staples***  
*(Photo Credit: Theresa DiPietto-Roesler & Kim Skillen)*



***Neighbors Supporting Neighbors event volunteer support***  
*(Photo Credit: Theresa DiPietto-Roesler & Kim Skillen)*



Before we move on to the guts of this report, we want to be clear about a few more things: We in the Village of Babylon and West Babylon understand that recovery and resiliency remain ongoing tasks that require continued collaboration with Federal, State and local authorities. We also recognize that we will not get everything we want, certainly not right away. But we are prepared to do our part, to work together to refine our priorities and do everything we can to get what we need.

If the Village of Babylon is a model for the way suburban villages should look and feel if they want to thrive, then we also hope to be a synonym for recovery and resiliency, a template for disaster preparedness. “The storm taught us that with the beauty of the shoreline also comes vulnerability,” said Ms. Skillen, a founder of Neighbors Supporting Neighbors and a member of the Island-wide community aid organization, Friends of Long Island. “We need to respect the power of nature and learn to live in harmony with her.”

As we claimed in the beginning, there is no place on Long Island—no better place—than the collective community of Babylon and West Babylon. Now, we want to be even better. With the help of the NY Rising Community Reconstruction Program, and our neighbors, we believe we can be the best.

### HISTORIC CONTEXT AND DISTINCTIVE FEATURES

The NYRCR Babylon/West Babylon Community owes its growth and success in large measure to the railroad and the waterfront. The Village of Babylon was incorporated in 1893 and is the oldest village within the Town of Babylon. Its bustling and walkable downtown district is unique to Suffolk County, making the Village a well-known regional destination. Both Babylon and West Babylon also feature waterfront parks, local marinas, historic structures, and significant amounts of preserved open space. The Long Island Rail Road (LIRR) connects points east (e.g., Montauk) and west (i.e., New York City), providing service to local residents and visitors alike. The Community’s accessibility to New York City played a large role in driving post-war growth and development in both the Village of Babylon and West Babylon and continues to attract new residents to the area.



*Historic building, Village of Babylon*



West Babylon is currently the most populous hamlet (43,213) within the Town of Babylon. In comparison, the Village of Babylon is much smaller, with a population of 12,166.<sup>2</sup> The southern portion of West Babylon, and all of Babylon, is developed on top of low-lying filled areas (i.e., former wetlands) that are within the 100-year flood zone. The water table in this zone is generally very high, leading to drainage issues throughout the Community. In addition, land gradually slopes down from north to south towards the Great South Bay resulting in flooding within the lower-lying portions of the Carlls River watershed. During storm events with significant rainfall, the Community experiences flooding from multiple directions.

The Community is unique among many other Suffolk County villages and hamlets as it is served by a large-scale, municipal wastewater treatment plant at Bergen Point. Because it is sewered, the area can support a denser pattern of development, particularly within the Village of Babylon's downtown district. However, the Bergen Point Wastewater Treatment Plant narrowly avoided failure at the height of the Superstorm Sandy, highlighting the need for stronger and more resilient infrastructure within coastal areas.



### A. GEOGRAPHIC SCOPE

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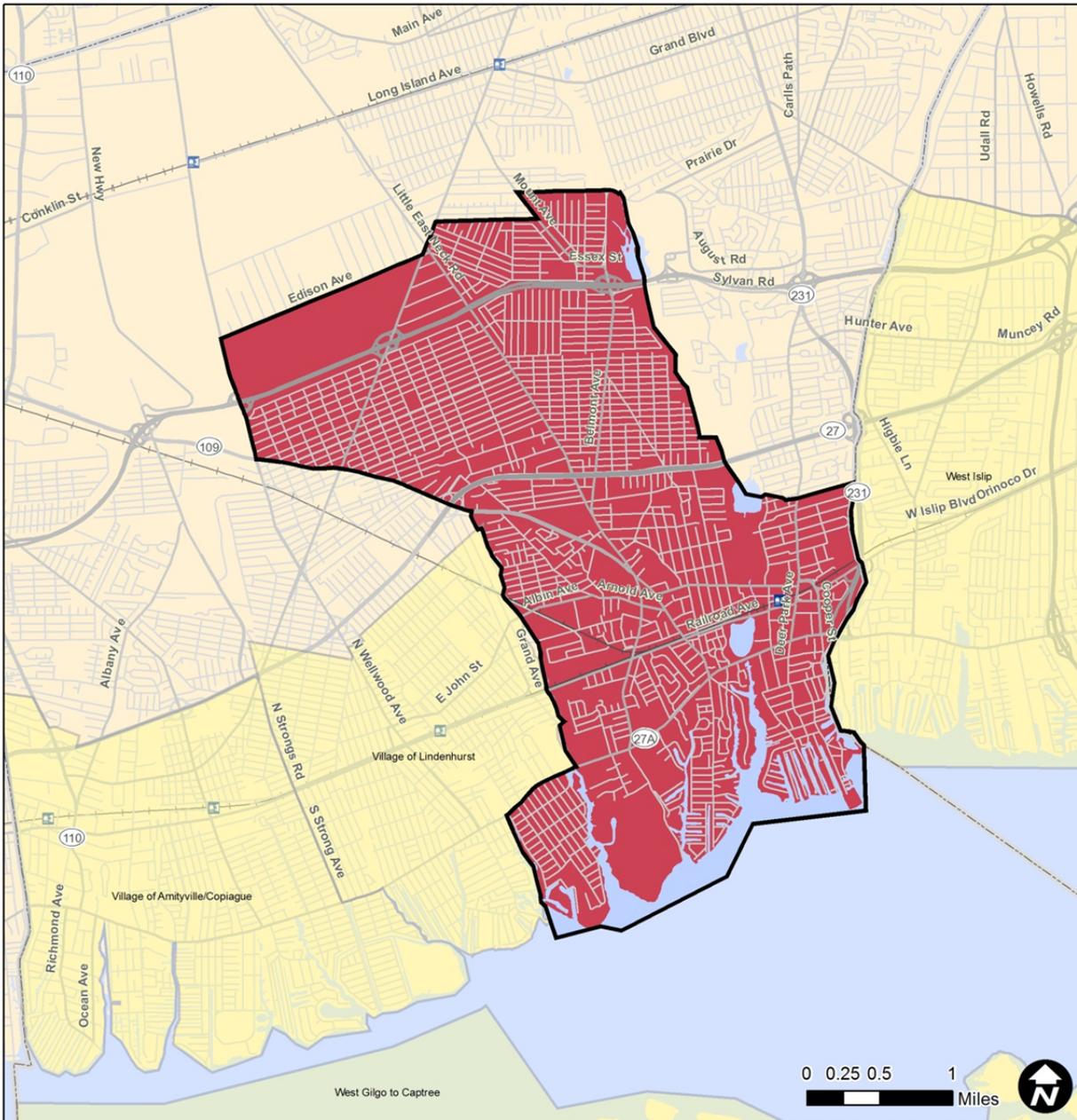
The identification of the geographic scope of the NYRCR Plan was of paramount importance as it helped inform the extent of the planning effort. As such, establishing a geographic scope was a crucial responsibility undertaken by the Committee. The geographic scope of the NYRCR Plan includes areas: where 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 instituted. The identification of more resilient areas for future development can be reinforced in municipal comprehensive plans as well as other local regulatory requirements.

The NYRCR Village of Babylon/West Babylon Community includes one incorporated village (Village of Babylon) and one hamlet within the Town of Babylon (West Babylon). The planning boundary follows the official boundaries of the Village and hamlet. In defining the geographic scope of the NYRCR Village of Babylon/West Babylon Community, several Committee Members expressed specific concerns about the neighborhood of Venetian Shores, which is a small peninsula located in the southwest corner of West Babylon. Venetian Shores is a unique neighborhood as it is within the boundaries of the hamlet of West Babylon, but it is served by the Lindenhurst School District and Lindenhurst Fire Department. Residents in this area also have a Lindenhurst address and zip code.

Since the Village of Lindenhurst is also a NYRCR Community, Committee Members from both communities were initially unclear about which Community would cover the peninsula. After discussions with both Committees and the New York State Department of State (NYS DOS), it was determined that Venetian Shores would remain within the NYRCR Village of Babylon/West Babylon Community. However, if there is an issue of regional significance affecting the peninsula, both communities are encouraged to collaborate and work together on such large-scale projects. By clearly defining the geographic scope and jurisdictional boundaries of the Community, the Committee was able to move forward with the identification of critical assets and the engagement of key stakeholders early in the planning process.



Figure 1: Location Map



<b>Legend</b>		<b>Roads</b>	
	Village of Babylon/West Babylon NYRCR Planning Area		Interstate
	Other NYRCR Planning Areas		Highways
	Long Island Railroad Station		Streets
	Long Island Railroad		Ferry
			Municipal Boundary

Source: NYS DOT, NYS DOS, MTA





### Demographic Overview

The Census data provided below is intended to provide an overview of the composition and general characteristics of the Community.<sup>3</sup>

#### ***Village of Babylon/West Babylon General Demographics***

Both the Village of Babylon and the hamlet of West Babylon are suburban communities. Census data for both the Village of Babylon and West Babylon CDP show a classic suburban distribution among age groups, with about 30% of the population between 35 and 54 years old, and the remaining thirds nearly evenly split between residents under 35 and over 55 years old.<sup>4</sup> Within both the Village of Babylon and West Babylon, school age children comprise approximately 23% of the population.

Ninety-two percent of the population of the Village of Babylon is White, with 2% African American, 2% Asian, and the remaining classified as 2% other and 2% two or more races. Eighty percent of the population of West Babylon is White, with 11% African American, 3% Asian, and the remaining classified as 4% other and 2% two or more races. The percentage of Hispanic/Latino residents in the Village of Babylon is about 7% and about 12% in West Babylon.<sup>5</sup>

About 20% of the population in West Babylon reports that they do not speak English at home, and about 10% of the population says they do not speak English “very well.” In the Village of Babylon, more than 90% of the population speaks English at home, but of the non-English speakers, most responded that they do not speak English “very well,” either.<sup>6</sup> This data is important for the identification of needs and opportunities as the non-English speaking population represents a community of concern that may not have easy access to important life safety information.

#### ***Income and Poverty***

Both communities include a diverse range of individual wage earnings. The Village of Babylon’s population includes proportionally more earners in the \$75,000 or greater range, while West Babylon reports a more even distribution of individual earnings. About 20% of the residents in both CDPs report that they earn under \$10,000 a year, but neither community includes a significant population under 150% of the poverty level, indicating that the population reporting individual income under \$10,000 is primarily composed of individuals who are financially secure by means other than their personal earnings, not individuals or families who represent an economically disadvantaged population.<sup>7</sup>

#### ***Employment and Journey to Work***

Understanding the general character of the communities’ workforce helped identify needs, opportunities, strategies, and projects to maintain, restore, and enhance the economic vitality of the community. More than half of the residents in both the Village of Babylon and West Babylon work within Suffolk County, and nearly all of the residents in both communities work somewhere within New York State. The majority of workers in both places drive alone to work or carpool. The next largest means of travel to work is by rail, but the percentage of rail commuters as a portion of all commuters in



both communities is 10% or less. The percentage of zero-car households in both communities is less than 5%.

While workers in both places support a diverse array of industries, educational services employ the greatest percentage of residents in both communities. In West Babylon, the second greatest employment sector is split between finance/real-estate and professional services.<sup>8</sup>

### ***Housing***

In both the Village of Babylon and West Babylon, most housing units are owner-occupied, and few are vacant. Although the NYRCR Village of Babylon/West Babylon Community is located along the coast, none of the reported vacancies are associated with seasonal rentals.<sup>9</sup>

In West Babylon, most of the vacancies are unoccupied rental units. In the Village of Babylon, most vacancies are for reasons other than the seven options provided by the Census.<sup>10</sup>

### ***Guidance and Insight from Demographic Analysis***

The demographic analysis indicated a few important trends and characteristics that were helpful in shaping the identification of needs, opportunities, and projects for the NYRCR Village of Babylon/West Babylon Community. One of the first observations was that schools and similar educational facilities are critically important. Not only are they important public facilities that provide a necessary service in terms of education, but the schools themselves are major employers. Ensuring the resiliency of educational facilities was therefore a goal strongly suggested by the Census data.

Additionally, the journey-to-work data indicated that most of the Community's workers commute by car. This led to identifying the opportunity of resilient roadway infrastructure to provide a means to travel to a worker's place of employment. At the same time, the opportunity to expand upon and provide resilient improvements to the pedestrian, bicycle, and transit networks was identified.

Lastly, housing type and occupancy data from the Census indicated that the resiliency of the housing stock is of vital importance. There are very few renter-occupied units in the Village of Babylon and West Babylon. Both communities also have relatively low residential turnover and few vacancies. The vacancy statistics reveal that both communities have an occupancy rate greater than 96% (compared to 88% County-wide).<sup>11</sup> This indicated that in the event of a catastrophic event, the homes affected are permanent residences and the affected homeowners and their families have few options for relocation within their community. The Census data therefore strongly suggest that programs and incentives to protect and preserve the existing housing supply, to facilitate potential increases in the diversity of house types, and to provide for the temporary housing of dislocated residents, should be recognized in the NYRCR Village of Babylon/West Babylon Plan. These Census findings were incorporated into the ongoing dialogue with the Committee and reflected in its effort to identify projects to help ensure the Community's resilience.



### B. DESCRIPTION OF STORM DAMAGE

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On Friday, October 19, 2012, a tropical depression formed in the Caribbean. In only six hours, the depression intensified into a tropical storm. This 18th named storm of 2012 was designated Tropical Storm Sandy. By the following Wednesday, on October 24, 2012, the storm's maximum sustained winds had increased to 74 MPH and Sandy was upgraded to a Hurricane.

After passing through the Caribbean—including Jamaica, Cuba, and the Bahamas—and fluctuating between a Category 1 and Category 2 Hurricane, on Saturday, October 27, 2012, Sandy turned north toward the U.S. coast. The storm made landfall near Atlantic City, NJ around 8:00 PM on Monday, October 29, 2012. The winds had decreased to just below the threshold for a Category 1 Hurricane, and meteorologists and the press christened it as "Superstorm Sandy."

The track of Sandy resulted in a worst-case scenario for storm surge 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, as well as 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. Thirty-five miles away, on the south shore of Suffolk County in Babylon, the storm surge reached nearly 6.5 feet.<sup>12</sup> This was on top of the morning tide that had already inundated the bay and had yet to retreat.

In addition to the triple threat of the enormous storm surge, the coinciding high tide, and the full moon, other factors conspired to create devastation. Nearby maximum wind gusts ranged from 79 mph in East Farmingdale to 90 mph at Islip Airport. Wave action during the storm was also fierce. An offshore 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).<sup>13</sup>

The destruction along the mid-Atlantic seaboard was unprecedented. Many lives were lost and preliminary damage estimates exceeded \$50 billion across the tri-state area. Official damage requests from the Governors of New York, New Jersey and Connecticut totaled approximately \$82 billion. On the local level, along Long Island's barrier beaches, damages were also substantial.

On the evening of Monday, October 29, 2012, storm surge from Superstorm Sandy inundated the Village of Babylon and the hamlet of West Babylon. The impact of the storm was devastating to both communities. Many dwellings and businesses located along the shore lost power and communications. Outages persisted for an extended period of time during the recovery process as Long Island faced one of the largest storm-related outages on record. Many homes and commercial buildings were inundated with a tidal surge of approximately six feet that extended well into the communities, reaching north of Montauk Highway in many locations.

Fires caused by eroded electrical wires destroyed property, posed safety concerns and strained an already taxed crew of emergency responders.



### ***Storm damage/flooding***

*(Photo Credit: NYRCR Babylon/West Babylon Committee)*

Rescue operations continued throughout the night while attempts were made to evacuate residents and provide vital services to those in need. Nursing homes along the waterfront presented significant challenges as access for vehicles and equipment was restricted by floodwaters. The NYRCR Village of Babylon/West Babylon Community was and remains fortunate to have such dedicated and experienced first responders and emergency service personnel.

When the winds finally abated and the waters calmed, residents were confronted with a level of destruction most had never experienced. Many streets remained partially flooded over the next few days as the water slowly receded into the Great South Bay. Roads were obstructed, traffic signals were not functioning, and vehicles and boats that had been destroyed during the storm were stranded in place. Homes were completely destroyed and rendered unlivable. Many were condemned, leaving residents without a home and away from the support of their community. Overall, 2,124 homes in the Village of Babylon and West Babylon were substantially damaged, with 1,990 sustaining “heavy” damage (>50%) or “strong” damage (20% to 50%).<sup>14</sup>



### ***Overview of Community flooding***

*(Photo Credit: NYRCR Babylon/West Babylon Committee)*

Storm impacts left much of the Community’s infrastructure damaged or unusable, and power remained unavailable to some residents for weeks. Debris removal was a major issue for the Community in the immediate aftermath of the storm. Many of the shorefront neighborhoods have only one access road in and out of the area. Debris on these roads had to be cleared and staged before relief to the hard-hit shoreline neighborhoods could be provided.



The Community also faced a serious problem with floating debris. Residential fuel oil tanks used for home heating and boats stored at the various local marinas floated away as the floodwaters rose. The volume and mass of storm-carried debris caused damage to other structures and obstructed roadways and access routes.

Without natural gas service in many areas, residents typically rely on outdoor fuel oil tanks to provide heating fuel. Many oil tanks ruptured, leaking their contents and contaminating the water and soil. Just five days after the storm, the Town of Babylon Department of Environmental Control (TOB DEC) recorded over 300 oil spills in the Town. To protect public health and safety, the New York State Department of Environmental Conservation (DEC) and TOB DEC and Division of Fire Prevention quickly collaborated



***Oil releases shortly after the storm***  
***(Photo Credit: Rich Groh, TOB DEC)***

to pump and remove these tanks from the Community.

Remarkably, amidst the battering from Superstorm Sandy, many local residents banded together to provide food, shelter and supplies for those who lost everything. These volunteers often set aside their own problems to assist their neighbors in any way possible.

Businesses, local civic associations, community organizations and residents less affected by the destruction mobilized to provide necessities and support services, both immediately following the storm and throughout the recovery process. Despite widespread devastation, Babylon and West Babylon residents were committed to helping their neighbors and restoring normality as quickly as possible. In fact, some residents (several of whom serve on the Committee) organized specific support networks and organizations, like Neighbors Supporting Neighbors and Babylon Helps.



### C. CRITICAL ISSUES

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The NYRCR Village of Babylon/West Babylon Planning Committee (Committee) expressed concern about a variety of resiliency issues relating both to protecting the life and safety of community members in the face of storm events and preserving the unique nature of the Community. Some of the most significant and critical issues identified included:

- Ensuring that municipalities and first responders, including fire departments, have the necessary resources to prepare for and protect the public, property, and the natural environment during and after disasters;
- Improving and strengthening communication systems before, during and after disasters;
- Establishing a service to identify temporary housing following major storm events;
- Increasing public education on disaster preparedness;
- Improving emergency evacuation preparedness and procedures;
- Implementing innovative technology to strengthen the resiliency of key assets and create redundancy in electrical power supply, i.e. microgrid system;
- Managing stormwater and water flow through the numerous lakes, ponds and stream tributaries within the Community; and
- Improving shoreline protection/resiliency.

The Committee also identified several critical issues to be addressed at the regional level, which included:

- Improving coordination with other emergency service providers, municipalities and key institutional entities;
- Addressing storm surge on Long Island in a regional context;
- Hardening key utility and transportation infrastructure to reduce future vulnerability; and
- Ensuring continued operation of the Bergen Point Wastewater Treatment Plant.



### D. COMMUNITY VISION

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The NYRCR Village of Babylon/West Babylon Planning Committee developed the following vision statement to guide the entire planning process and ensure that the recommended actions – included in the NYRCR Babylon/West Babylon Plan – address the critical issues they identified.

#### Vision Statement

*The residents of Babylon Village, West Babylon, and Venetian Shores are committed to developing stronger, more resilient communities by implementing innovative infrastructure projects, land use policies, “green” technology, and emergency management procedures to better prepare for natural disasters and to preserve the region’s historic and nautical character and quality of life. We will accomplish those goals through sustained economic investment, improved communication, and strong educational outreach, which will provide an ongoing example of what can be achieved when communities come together with a common purpose.*



### E. RELATIONSHIP TO REGIONAL PLANS

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One of the major outcomes following Superstorm Sandy was a collective realization that many of the significant issues affecting Long Island communities must be addressed at the regional level. Due to the geography of Long Island, many towns and villages share similar challenges as well as opportunities relative to the natural environment, physical infrastructure, economic development and other built systems. Potential regional issues are expanded upon below.

#### Potential Regional Issues and Concerns

**Natural Environment:** Long Island has 1,180 miles of shoreline fronting the Atlantic Ocean, the Long Island 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 the Fire Island National Seashore and Bethpage State Park. The Pine Barrens contain wetlands and dry upland areas that are inhabited by an array of wildlife species, many of which are endangered or threatened. Since Long Island's water supply comes from its underground aquifers, the continued protection of Long Island's sole source aquifers is also a significant regional issue.

**Developable Land Supply:** Almost two-thirds of Long Island's land is developed with buildings, pavement, and other manmade structures. This condition, in combination with the large amount of protected and preserved land, results in a constrained supply of available vacant land to accommodate new housing or economic development activities.

**Water Quality:** Long Island's aquifers receive their fresh water from precipitation, which percolates into the ground and is recharged into the groundwater system. The greatest threat to the quality of this water is development (residential, commercial, and industrial) in sensitive areas that would add pollutants and impede the absorption of precipitation. As water is drawn for use in coastal areas, less groundwater is available to be discharged into the estuaries. The subsequent loss of water and pressure allows saltwater from the ocean to flow into the aquifer, causing the groundwater to become saline and undrinkable. This is known as "saltwater intrusion" and is a threat to drinking supply across many coastal communities on Long Island.

Other threats to water quality include non-point source pollution and stormwater runoff, which are county-wide concerns. Non-point 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. The Great South Bay is a critical surface water body where several local watersheds converge with marine waters. It also forms a significant habitat comprising features such as barrier beaches and islands, wetlands, and marsh islands. Additionally, the bay is a key component of the local economy that relies on the health and stability of the bay ecology. As a result, the bay is in many ways a regional resource.



Degradation of water quality as a result of non-point source runoff is of rising concern relative to the bay. Non-point source releases 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 recreational 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.

**Utilities:** Electricity and the susceptibility of the power grid are both national and regional issues of concern. Long Island's Regional Economic Development Council (REDC) Strategic Economic Development Plan for Nassau and Suffolk Counties: 2013 Update has similarly stressed the importance of addressing utility vulnerabilities which currently exist across the Island.<sup>15</sup> More specifically, one of the longest-lasting impacts of Superstorm Sandy was the vulnerability of Long Island's electric power grid. The Smarter Grid Research, Innovation, Development, Demonstration & Deployment (SGRID3) initiative, a collaboration between Stony Brook University and Brookhaven National Laboratory, initially focused on the development and deployment of new smart grid technologies as a mechanism to reduce energy and associated costs to consumers. However, this objective changed in the wake of Superstorm Sandy with the focus shifting to autonomous control capabilities that when employed would make Long Island's grid more resilient during weather events and able to recover more quickly in the aftermath.

**Climate Change:** As a coastal area, Long Island is susceptible to rising sea levels, especially given the relationship between rising seas and larger, more frequent storm surges. The south shore is particularly vulnerable, with many low-lying communities and a relatively dense pattern of suburban development. 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 by 2080.<sup>16</sup> Should polar icecaps melt rapidly, climate models project that sea levels will rise even more. As a result, climate change, and sea level rise in particular, is a significant Island-wide issue.

### ***Review of Existing Plans and Studies***

To better understand the planning environment and the work done to date within the Village of Babylon and hamlet of West Babylon, as well as the regional level, an effort was undertaken to review pertinent plans, studies, and reports. The following plans were identified and reviewed:

- *Environmental Study of the Barrier and Bay Island Communities, Town of Babylon* (1994)
- *A Plan for the Future of the Town of Babylon, Draft Comprehensive Plan* (March 1998)
- *Town of Babylon Sustainable Complete Streets Policy* (July 2010)
- *Suffolk County Multi-Jurisdictional Multi-Hazard Mitigation Plan* (October 2008)
- *Land Available for Development and Population Analysis Western Suffolk Country* (October 2009)
- *Suffolk Country Comprehensive Plan 2035* (August 2011)



- *Managing Stormwater – Natural Vegetation and Green Methodologies* (2011)
- *Suffolk County Transfer of Development Rights (TDR) Study: An Inventory of Existing TDR Programs, NY-CT Sustainable Communities Consortium* (March 2013)
- *Suffolk County Comprehensive Water Resources Management Plan: Executive Summary, County of Suffolk* (January 2014)
- *Long Island South Shore Estuary Reserve Comprehensive Management Plan* (April 2001)
- *Fire Island Inlet to Montauk Point New York Reformulation Study* (May 2009)
- *Places to Grow: An Analysis of the Potential for Transit-Accessible Housing and Jobs in Long Island’s Downtowns and Station Areas, Regional Plan Association/Long Island Index* (January 2010)
- *Long Island 2035: Securing a Sustainable Future/A Comprehensive Regional Sustainability Plan* (December 2010)
- *Connect Long Island: A Regional Transportation and Development Plan* (October 2011)
- *Long Island’s Future Economy: Regional Economic Development Council Strategic Plan* (November 2011; updates released in 2012 & 2013)
- *Cleaner Greener Long Island Regional Sustainability Plan* (May 2013)

Despite a lack of existing comprehensive land use or vision plans for the Village of Babylon or hamlet of West Babylon, there are numerous plans and studies from the Town of Babylon and Suffolk County that address issues within the NYRCR Village of Babylon/West Babylon Community.

### **Town of Babylon Plans and Studies**

#### ***Environmental Study of the Barrier and Bay Island Communities (1994)***

In 1994, the Town of Babylon released an environmental study to identify environmental and land use concerns along the coast including water quality, erosion control, natural systems, developable land, community cost/benefit analysis, homeowner equity, and public access. The recommended strategies were intended to maintain existing character of the coastal communities, support appropriate land use and development, maintain and improve natural systems, implement mitigation measures to protect public property, and properly utilize coastal regions as a public good.

#### ***A Plan for the Future of the Town of Babylon, Draft Comprehensive Plan (March 1998)***

In 1998, the Town of Babylon adopted A Plan for the Future of the Town of Babylon, which includes five central themes: preserving the Town’s suburban character; responding to the changing population; improving quality of life in economically distressed areas; increasing jobs and economic development; and protecting natural resources. The comprehensive plan proposes town regulations, such as building codes and ordinances, designed to preserve the suburban character of the Town. The issues identified throughout the NYRCR planning process were closely linked to several of identified goals of the comprehensive plan, including improving the physical character of neighborhoods, improving the quality of life, and preserving natural resources.



### *Sustainable Complete Streets Policy (July 2010)*

In 2010, the Town of Babylon published a *Sustainable Complete Streets Policy* that analyzed the relationship between road, bike, and pedestrian networks and recommended strategies to promote multi-modal transit options, limit greenhouse gas emissions, and ensure safety for all modes of transportation. This Town-wide policy lays the framework for implementation of community-oriented transportation improvements in the Town's villages and hamlets. Given the various clusters of assets within the NYRCR Community, such as the Village of Babylon's waterfront and downtown areas, multi-modal transportation improvements can help to increase economic resiliency, improve public health and safety, and stimulate tourism and economic development.

### **Suffolk County Plans and Studies**

#### *Suffolk County Multi-Jurisdictional Multi-Hazard Mitigation Plan (October 2008)*

In 2008, Suffolk County developed an *All-Hazard Mitigation Plan* with participation from Towns and Villages, including the Town of Babylon and the Village of Babylon. Implementation of mitigation strategies is the responsibility of local governments and regional partners. The plan is submitted to and approved by the New York State Office of Emergency Management and the Federal Emergency Management Agency (FEMA). The plan details strategies to reduce the impact of future disasters and hazards including developing more sustainably and resiliently, resource management, and implementing planning processes that reduce long term impacts to health and property loss. Suffolk County is currently in the process of updating their Hazard Mitigation plan.

#### *Land Available for Development and Population Analysis Western Suffolk County (October 2009)*

In October 2009, the Suffolk County Department of Planning prepared this plan for the Department of Health Services as part of the Comprehensive Water Resources Management Plan. The study details developable land by residentially-, commercially-, and industrially-zoned lots by size, neighborhood population, and groundwater management zone. The intent of the study is to project developable land based on type of allowable use, available water, and existing demand. Overall, the Town of Babylon has the smallest acreage available in Suffolk County (469 acres; 1.5% of upland area available). At the time of the report, the Village of Babylon only had 14 acres of vacant land available for development, all zoned for residential uses. West Babylon had 62 acres of land available for development, with 53 acres zoned for residential uses, three acres zoned for commercial uses, and six acres zoned for industrial uses.

#### *Suffolk County Comprehensive Plan 2035 (August 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. It details the vision for County growth through 2035 and is used to inform policies and programs. The Comprehensive Plan serves as an update to the 1970's plan with the inclusion of additional topics including groundwater protection, farmland



preservation, and open space planning. Each of Suffolk's ten towns and 32 villages are included in the study. Topics include demographic and economic estimates and projections, natural resource identification and recommendations for preservation and quality improvements, land use inventory and identification of future needs, human and cultural resources, energy supply and consumption including carbon impact study, and a solid waste plan. The plan also coordinates closely with Long Island Regional Planning Council's Sustainable Strategies for Long Island 2035 Plan. As subsequent volumes of the plan are prepared, both the Village of Babylon and West Babylon may potentially be affected by the recommendations of the plan as it involves County roads, drainage, parks, and waste water treatment—all issues of importance to the Committee.

### ***Managing Stormwater – Natural Vegetation and Green Methodologies (2011)***

In February 2011, Suffolk County released a guidebook on stormwater management to inform municipalities about best practices for stormwater management including green infrastructure processes and benefits. Topics include policies to protect groundwater such as overlay districts, subdivision regulations with design flexibility, site plan review process, and disincentives for inappropriate use of fertilizers. With a relatively dense pattern of suburban development throughout both Babylon and West Babylon, improving stormwater management is a key concern of the NYRCR Planning Committee. Improved stormwater management would result in multiple benefits throughout the Community, including: reduced and delayed runoff volumes, enhanced groundwater recharge, reductions in pollutant discharge into rivers, streams, tributaries and bays, reduced sewer overflow events and additional wildlife habitat and recreational space.

### ***Suffolk County Transfer of Development Rights (TDR) Study: An Inventory of Existing TDR Programs, NY-CT Sustainable Communities Consortium (March 2013)***

Developed through a 2011 US Housing and Urban Development Sustainable Communities Regional Planning Grant, this report documents and describes all TDR plans, programs, policies and ordinances in Suffolk County. TDR has been used to protect Long Island's aquifer-based drinking water by preserving thousands of acres in the Long Island Pine Barrens. TDR can be an important tool for storm resiliency by helping to shift development from high-risk shoreline areas to low-risk inland areas appropriate for higher density, such as Transit-Oriented Developments along Long Island's rail corridor.

### ***Suffolk County Comprehensive Water Resources Management Plan: Executive Summary, County of Suffolk (January 2014)***

In this report, Suffolk County Executive Steve Bellone identifies nitrogen pollution of ground and surface waters as the region's greatest threat to public health and safety. Highlighting the fact that 70% of the County (or 350,000 homes) is unsewered, the report launches an effort to identify and prioritize parcels of land most critical to water quality management; these parcels will be targeted for sewer connections and septic system upgrades. The report states: "Water is the single most significant resource for which Suffolk County bears responsibility. As the impact of Superstorm Sandy underscored, more than at any time in our history, we are obliged to come to terms, in every sense, with the water that surrounds us."<sup>17</sup>



### Long Island Regional Plans and Studies

#### *Long Island South Shore Estuary Reserve Comprehensive Management Plan, Long Island South Shore Estuary Reserve Council, NYS DOS (April 2001)*

The Long Island South Shore Estuary Reserve (SSER) stretches 70 miles from the western border of Nassau County to the center of Suffolk County encompassing all the Bays (Hempstead, South Oyster, Great South, Moriches, and Shinnecock) between Fire and Jones Islands and mainland Long Island. The SSER CMP takes a holistic approach managing the South Shore Estuary for both human and environmental needs. It makes recommendations to improve and maintain the SSER's water quality, to protect and restore living resources, to expand public use, and to sustain and improve related economies.

#### *Fire Island Inlet to Montauk Point (FIMP) Reformulation Study, U.S. Army Corps of Engineers (May 2009)*

According to a summary of the planning process prepared by the Corps, 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 from Fire Island Inlet to Montauk Point. The planning area extends northward to Sunrise Highway on the mainland. The study is expected to be completed in the near future. Upon approval, funding will become available to complete projects recommended in the study. The Fire Island to Montauk Point Reformulation Study Update was prepared to account for the impacts of Superstorm Sandy and to coordinate several ongoing interim projects. The overall purpose of the study is "to evaluate a range of possible alternatives to address storm damage risk, including the screening of various Storm Damage Reduction (SDR) alternatives and their designs, analysis of potential impacts associated with various designs, design optimization, and selection of a recommended plan for the Project area."<sup>18</sup> The issues and needs described in the study pertaining to long shore sediment transport, cross-shore sediment transport, dune growth and evolution, bayside shoreline processes, and circulation and water quality, are vital issues for Babylon and West Babylon. The study treats the beaches, dunes, sediments, and marshes as one system that must be managed in order to increase resiliency. Likewise, the NYRCR Committee approached their landscape as a similar system in which all components must be strengthened to truly reduce risk and achieve resiliency.

The USACE New York District website on the FIMP Reformulation study was last updated on March 17, 2014 to reflect the following information on the status of the study:<sup>19</sup>

- *The Draft Hurricane Sandy Limited Re-evaluation Report (HSLRR)* is complete. The HSLRR identifies the area's vulnerability, discusses existing/future conditions with vs. without FIMP-related restoration, provides an overall construction schedule (currently anticipated as September 2014 through August 2015) and acquisition maps, and an overall cost estimate for the project of \$161,514,000 based on October 2013 price levels. The HSLRR includes stabilization layouts throughout the project extents, including contours and grading and berm heights.



- The project's *Draft Environmental Assessment (DEA)* is available online for public review and comment. Comments provided by April 2, 2014 will be considered going forward, and included in the project record.

The DEA includes prior engineering and design efforts, surveys, and environmental compliance analysis. Topics include economics, transportation, and natural resources, all compared to the “No Action” condition. It identifies a Tentatively Selected Plan (TSP) with maps, plans, and volumetric calculations, based on analyzing multiple alternatives, many of which were found to be cost-effective. Multiple measures are necessary because no single alternative can address every storm risk management problem. Recommended features thus far include Inlet bypassing Plans; Breach Response Plans; Non-Structural Plans (6-year and 10-year levels of risk management); and Beachfill with new 13-15 foot tall dunes. The DEA analyzes the beachfill feature combined with incremental levels of the other features (storm management, dunes, and structural alternatives).

***Places to Grow: An Analysis of the Potential for Transit-Accessible Housing and Jobs in Long Island's Downtowns and Station Areas, Regional Plan Association/Long Island Index (January 2010)***

This report identifies 8,300 acres of undeveloped land in and around over 150 downtowns and transit stations on Long Island. This information is important for storm resiliency because it emphasizes sustainable development and Smart Growth in inland areas, away from high-risk shoreline areas.

***Long Island 2035: Securing a Sustainable Future/A Comprehensive Regional Sustainability Plan, Long Island Regional Planning Council (December 2010)***

The plan identified challenges facing Long Island related to the region's ability to sustain itself fiscally, environmentally, and socially. The plan proposed fundamental changes to positively alter the region's future by noting that, “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.”

***Connect Long Island Plan: A Regional Transportation and Development Plan, Town of Babylon (October 2011)***

This is a plan for regional economic development and quality-of-life, focusing on strategic, sustainable public infrastructure investments along Long Island's transit corridor. The plan scope is three-fold: promote Transit-Oriented Development (TOD); improve transit connections between TOD destinations; and create greater connectivity between transit and job hubs, including north-south transit service. These goals are important for regional storm resiliency as they will provide greater housing and economic development opportunities along the rail corridor, away from the high-risk flood areas along



the shore. And demographics on Long Island indicate a growing need for housing in “Smart Growth” communities—that is, compact, mixed-use downtown centers within close proximity to public transit.

*Long Island’s Future Economy, Long Island Regional Economic Development Council (November 2011, updated in 2012 & 2013)*

This Plan, first released in 2011, was initiated by New York State as a means to help develop the 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:

- Create a cohesive education and workforce training strategy;
- Develop innovation and industry clusters in transformative locations;
- Enhance and develop multi-faceted, interdisciplinary facilities for commercialization of innovative products;
- Reinvigorate Long Island’s manufacturing sector;
- Produce a new generation of sustainable, good-paying jobs; and
- Rebuild and expand infrastructure

The 2012 Update added strategies in these areas:

- Innovation and Industry Clusters
- Infrastructure Strategies
  - Revitalize Downtowns, Blighted Areas and Commercial Centers;
  - Repair and Upgrade Aging Infrastructure;
  - Create New Housing Opportunities; and
  - Promote New Government Policies to Foster Economic Growth
- Natural Assets Strategies
  - Improve Sustainable Agriculture Enterprises;
  - Improve the Economic Potential and Employment Opportunities of Fisheries and Aquaculture; and
  - Enhance Ecotourism and Cultural Tourism Activities
- Workforce and Education Strategies
  - Strategies for Growth Sectors;
  - Science, Technology, Engineering, and Mathematics (STEM);
  - Advanced manufacturing / information technology;
  - Healthcare/Life Sciences; and
  - Green technologies



- General Strategies
  - Provide support services, incubators, and skills development for new businesses;
  - Create partnerships between sectors to improve educational outcomes;
  - Encourage collaborative relationships to provide quality, affordable childhood education; and
  - Promote arts organizations, artists and programs

The 2013 Update added two new significant strategies:

- Protect Long Island from the perils of climate change; and
- Revitalize Long Island's poorest places

The LI REDC Plan highlights many of the regional concerns important to the communities of Babylon and West Babylon, such as rebuilding infrastructure, utilizing green technologies, and enhancing ecotourism and cultural tourism activities. The NYRCR planning process will also play a significant role in helping to protect Long Island from the impacts of climate change. Increasing the resiliency of assets, reducing risks to individuals and properties, and improving emergency preparedness procedures are all key strategies in addressing climate change at the local level.

### ***Cleaner, Greener Long Island Regional Sustainability Plan, Long Island Regional Sustainability Consortium (2013)***

Created through Governor Cuomo's Cleaner, Greener NY Program, the plan sets forth a regional, community-based vision for future sustainability on Long Island based on economic prosperity, social responsibility and environmental health. A Regional Sustainability Consortium—composed of technical experts and local stakeholders—developed strategies and recommendations in five main focus areas: Economic Development and Workforce Housing; Energy; Transportation; Land Use and Livable Communities; Waste Management; Water Management; and Governance and Implementation.



## Section 2: Assessment of Risk and Need

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*Venetian Shores Park*



### A. DESCRIPTION OF COMMUNITY ASSETS AND ASSESSMENT OF RISK

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A critical goal of the Village of Babylon/West Babylon 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 are places, services, or groups that fulfill the important community economic, environmental, and social functions. 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 NYRCR Village of Babylon/West Babylon Community (Community) whose loss or impairment due to flood events would compromise essential functions or critical facilities of the community. 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.

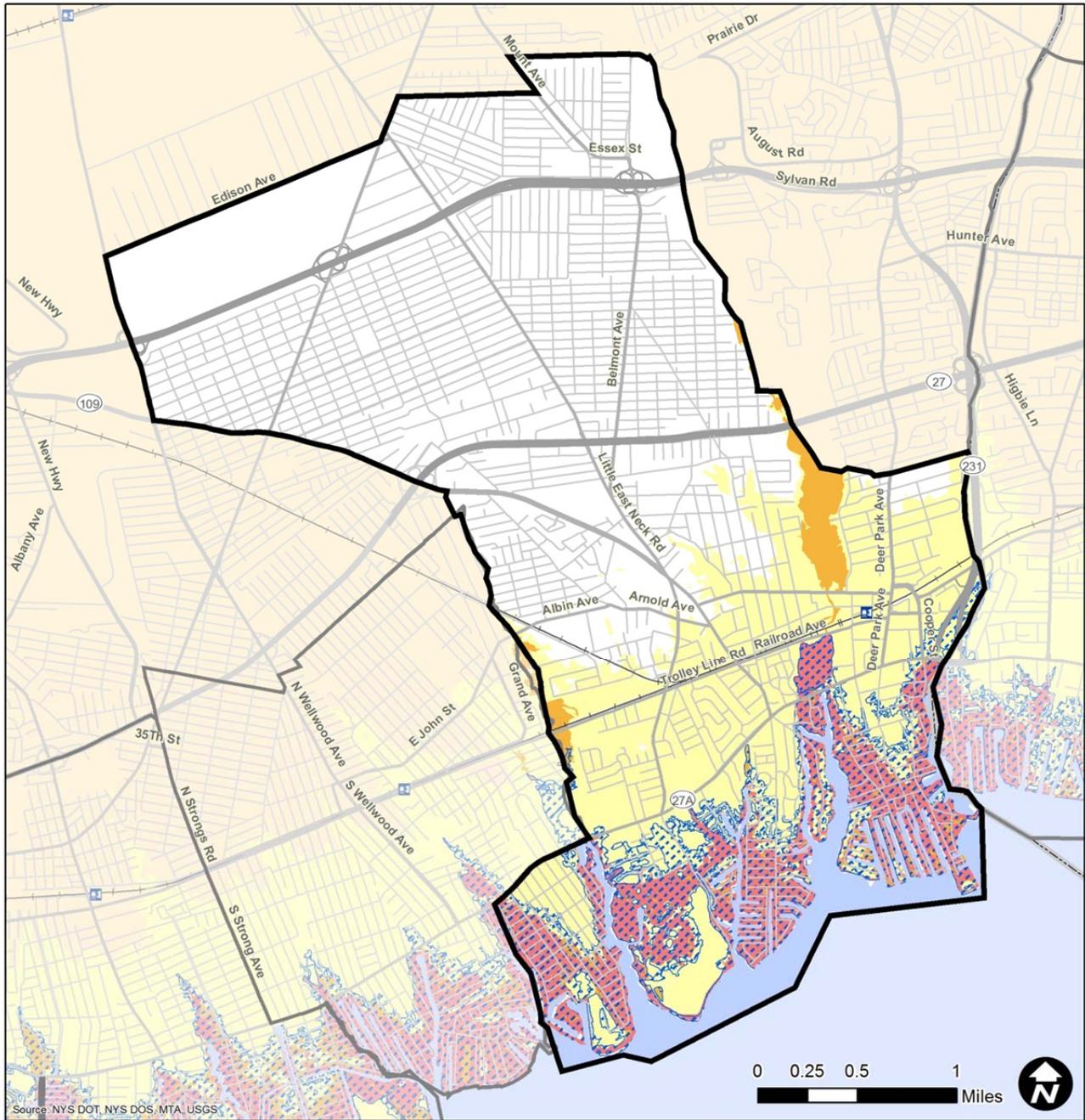
Assets were identified in three geographic areas at risk to storm inundation and sea level rise:<sup>20</sup>

- **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 on the next page is the Risk Assessment Map of the Village of Babylon/West Babylon Community.



Figure 2: Risk Assessment Map



Legend		Roads	Risk Area	
	Village of Babylon/West Babylon NYRCR Planning Area			Extreme
	Other NYRCR Planning Areas			High
	Long Island Railroad Station			Moderate
	Long Island Railroad			Hurricane Inundation





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. High Value Community Assets will also generally be limited in number within a community and be difficult to replace in the short- to mid-term.*

*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 whose function could be replaced or duplicated in a mid-term time frame without significant burden to a Community's long-term health. Median Value Community Assets are generally more common than High Value Assets.*

*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 NYRCR 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 5.

### ***i. Description of Community Assets***

Assets were identified through two methods: community engagement and technical mapping. The community engagement approach was undertaken by members of 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 technical mapping effort was undertaken using data 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 hidden 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. The asset classifications, which included facilities and/or specific places as well as systems (storm sewer, electric, etc.), are as follows:

- Natural and Cultural Resources;
- Health and Social Services (Life Safety and Administration/Education);
- Infrastructure Systems (Transportation and Utilities);
- Housing; and
- Economic

### 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 Babylon and West Babylon 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 undeveloped natural coastal resources actually provides 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 natural and cultural resources, such as the Carlls River watershed, are relatively large in geographic area and span multiple risk assessment areas. While relatively dense suburban development patterns throughout the Town of Babylon have compromised the overall health of the watershed, many residents recognize, particularly following Superstorm Sandy, that the watershed plays a critical role in managing stormwater and local water quality.

Five parks are located within the NYRCR Village of Babylon/West Babylon Community: Belmont Lake State Park, Southards Pond Park, Bergen Point Golf Course, Venetian Shores Park, and Argyle Lake Park (see Table 2). These parks are all located in risk areas. Belmont Lake State Park and Southards Pond are located partially in the Moderate risk area. Bergen Point, Venetian Shores, and Argyle Lake are all located near major water bodies and include areas at High and Extreme risk.



**Table 2. Parkland Resources**

Asset/Resource	Risk Assessment Area(s) <sup>4</sup>	Community Value
Belmont Lake State Park	Moderate and N/A	Medium
Southards Pond Park	Moderate and N/A	Medium
Bergen Point Golf Course	Moderate, High, and Extreme	Medium
Venetian Shores Park	Moderate, High, and Extreme	Medium
Argyle Lake Park	Moderate, High, and Extreme	Medium

The rivers and creeks that flow north to south through the NYRCR Community are associated with several areas of freshwater wetlands, and the wetlands along Carlls River support a Natural Heritage Community (see Table 3).

**Table 3. Natural Resources**

Asset/Resource	Risk Assessment Area(s)	Community Value
Freshwater Wetlands associated with Carlls River, Santapoque Creek, Sampawams Creek, and the Babylon and West Babylon Creeks	Moderate, High, and Extreme	Medium
Natural Heritage Communities: Red Maple-Blackgum Swamp	Moderate	Medium

Two properties listed in the National Register of Historic Places are located in the NYRCR Community (see Table 4). Both are north of Montauk Highway, in the Moderate risk area.

**Table 4. National Register Listed Historic Resources**

Asset/Resource	Risk Assessment Area(s)	Community Value
Nathaniel Conklin House	Moderate	Medium
Babylon Town Hall	Moderate	High

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<sup>4</sup> Assets not in the extreme, high, and moderate risk assessment areas are noted as not applicable (N/A.)



### 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, which coordinate emergency services during an emergency, two are located along the South Shore of Long Island: the Babylon Town Civil Defense facility is located directly north of the NYRCR Lindenhurst Community and the Islip Public Safety facility is located between the NYRCR West Islip and Oakdale/West Sayville Communities. There are no emergency operations facilities located within the NYRCR Village of Babylon/West Babylon Community.

The NYRCR Village of Babylon/West Babylon Community has one police station, the Suffolk County Police Department’s First Precinct (see Table 5). The building housing the police department is located outside of the Risk Assessment Areas.

Within the NYRCR Village of Babylon/West Babylon Community, there are eight fire stations under the control of four fire departments (see Table 6). The Argyle, Babylon HQ, West Babylon 3, and Cedar Street fire stations are all located in the Moderate risk area. The four other fire stations are located outside of the Risk Assessment Areas.

There are no hospitals located within the Community. The closest hospital, Good Samaritan Hospital Medical Center, is located in West Islip.

**Table 5. Police Stations**

Asset/Resource	Risk Assessment Area(s)	Community Value
Suffolk County Police Department First Precinct	N/A	High

**Table 6. Fire Stations**

Asset/Resource	Risk Assessment Area(s)	Community Value
Argyle HQ	Moderate	High
Babylon HQ Fire Station	Moderate	High
E. Farmingdale Fire Station 2	N/A	High
N. Babylon Fire Station 2	N/A	High
W. Babylon Fire Station 2	N/A	High
W. Babylon Fire Station 3	Moderate	High
W. Babylon HQ Fire Station	N/A	High
Cedar St. Fire Station	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.

A New York State Parks Recreation & Historic Preservation office is located in a non-risk area in the northeastern corner of the NYRCR Community adjacent to the Southern State Parkway (see Table 7).

**Table 7. NYS Facilities and Offices**

Asset/Resource	Risk Assessment Area(s)	Community Value
OPRHP - Long Island Region	N/A	Low

A total of 22 NYS Office for Persons with Developmental Disabilities (OPWDD) locations are spread throughout the Community, 17 of which are sited in non-risk areas. The remaining four sites all fall within Moderate risk areas in the southern portion of the Community near the Babylon LIRR station and marina areas (see Table 8).

**Table 8. NYS OPWDD State and Voluntary Program Locations**

Asset/Resource	Risk Assessment Area(s)	Community Value
134 Park Ave., Apt 4U-IRA	Moderate	High
93 Clair Court	Moderate	High
Catholic Charity of Rockville Centre	Moderate	High
WORC Park Ave VOIRA	Moderate	High
17 Facilities	N/A	High

Two post offices serve the Community, one in Babylon near the LIRR station and the other serving West Babylon in the northwest portion of the Community (see Table 9). The Babylon post office is located inside a Moderate risk area.

**Table 9. Post Offices**

Asset/Resource	Risk Assessment Area(s)	Community Value
Babylon	Moderate	Low
West Babylon	N/A	Low



There are thirteen identified schools located in the NYRCR Community, nine of which are located in non-risk areas (see Table 10). The remaining four schools are located in Moderate risk areas near the LIRR rail line and Montauk Highway. Four schools are identified by NYS DOS as emergency shelter facilities, as noted in Table 11; all are within non-risk areas.

**Table 10. Schools**

Asset/Resource	Risk Assessment Area(s)	Community Value
Harding Avenue School	Moderate	High
John F Kennedy School	Moderate	High
Saint Joseph’s School	Moderate	High
South Bay School	Moderate	High
Belmont Lake Junior High School	N/A	High
Belmont School	N/A	High
Forest Avenue School (Shelter)	N/A	High
Our Lady of Grace School	N/A	High
Santapogue School	N/A	High
Tooker Avenue School (Shelter)	N/A	High
West Babylon High School (Shelter)	N/A	High
West Babylon Junior High School (Shelter)	N/A	High
West Babylon School	N/A	High

**Table 11. Shelters**

Asset/Resource	Risk Assessment Area(s)	Community Value
Forest Avenue School	N/A	High
Tooker Avenue Elementary School	N/A	High
West Babylon High School	N/A	High
West Babylon Jr. High School	N/A	High

A highway maintenance building owned by the New York State Department of Transportation (NYS DOT) is located on John Street within a Moderate risk area between Montauk Highway and Farmingdale Road (see Table 12). Three other state-owned buildings are identified in the Community and fall within non-risk areas.

**Table 12. State-owned Buildings and Properties**

Asset/Resource	Risk Assessment Area(s)	Community Value
NYS DOT - Hwy Maint., John St.	Moderate	Low
Mental Health Main Office	N/A	Low
Mental Health Main office - Lindenhurst Hostel #2753	N/A	Low
Transportation Dept. - Hwy Maint., North Babylon	N/A	Low



The Babylon Village Hall is located within a Moderate risk area south of the Babylon train station and north of the marina (see Table 14).

**Table 13: Town/Village Halls**

Asset/Resource	Risk Assessment Area(s)	Community Value
Babylon Village Hall Center	Moderate	High

The Babylon Veteran Center is located in the southeast corner of the Community near Babylon train station north of the marina (see Table 14). It falls within a Moderate risk area along Montauk Highway.

**Table 14. Veterans Affairs Facilities**

Asset/Resource	Risk Assessment Area(s)	Community Value
Babylon Veteran Center	Moderate	High

## Infrastructure: Transportation

Major roadways extending through the NYRCR Community include the Southern State Parkway, Sunrise Highway (SR 27) and State Route 109. Additionally, W. Montauk Highway/Main Street (SR 27A) is located mostly in a Moderate risk area with a small portion from Argyle Avenue to Carlston Place designated in the Extreme area. Roadways beneath the elevated LIRR right-of-way such as Railroad Avenue/Trolley Line Road are in a Moderate area. Little East Neck Road from Waterman Street south to Montauk Highway is in a Moderate area. Similarly, Great East Neck Road from Arnold Avenue to Montauk Highway is also in a Moderate area.

LIRR's heavily utilized Babylon line provides frequent service to points west and east. This particular NYRCR Community is home to one elevated LIRR station. In addition, one inter-city bus station, at 235 Deer Park Avenue, is located within the Community.



A total of six LIRR spans, built in the early 1960s, are located within Moderate risk areas (see Table 15).

**Table 15. Bridges**

Asset/Resource	Risk Assessment Area(s)	Community Value
LIRR Bridge crossing SR 109 (BIN # 7036910)	Moderate	Medium
LIRR Central Branch crossing Great East Neck Rd. (BIN 7709640)	Moderate	Medium
LIRR Montauk Branch crossing Great East Neck Rd. (BIN 7709980)	Moderate	Medium
LIRR Montauk Branch crossing Litchfield Ave. (BIN 7709990)	Moderate	Medium
LIRR Montauk Branch crossing Deer Park Ave. (BIN 7710010)	Moderate	Medium
LIRR Montauk Branch crossing Cooper St.	Moderate	Medium

Two at-grade crossings (Muncy Street, Albine Avenue) with two LIRR crossing gates each are located along the LIRR Central Branch within the Community. This infrastructure is not within a Risk Assessment Area.

NYS DOT facilities located within this NYRCR Community are noted in Table 16.

**Table 16. NYSDOT Facilities**

Asset/Resource	Risk Assessment Area(s)	Community Value
N. Babylon (Salt Shed)	N/A	Low
Babylon BC (Special Crew HQ)	Moderate	Low
Babylon BC (Special Crew HQ)	Moderate	Low

**Infrastructure: Utilities**

No major utility property was identified within the Extreme and High risk areas of the NYRCR Community. A number of utilities are present with the Moderate risk area including, in particular, the Bergen Point Wastewater Treatment Plant, which serves the Southwest Sewer District, Suffolk County’s largest sewer district (see Table 17). Gas, electric, and water distribution systems are present throughout these areas, but have not been identified and mapped.

**Table 17. Infrastructure Resources**

Asset/Resource	Risk Assessment Area(s)	Community Value
1 flood control property	Extreme	High
1 sewage treatment plant	Moderate	High
1 drinking water treatment plant	Moderate	High
2 drinking water wells	Moderate	High
2 microwave towers	Moderate	High
2 rail support facilities	Moderate	High
1 telephone utility	Moderate	High



## Housing

A significant number of residential structures are at risk of future flooding and/or storm surge events within the Community. Almost 2,000 residential structures are located within the Extreme risk area while a smaller number, or approximately 230, are found within the High risk area (see Table 18). The Moderate risk area contains an estimated 4,325 single-family, 272 two-to-three-family, and 129 multi-family residential structures.

**Table 18. Housing Resources**

Asset/Resource	Risk Assessment Area(s)	Community Value
1,932 single-family, 63 two-three-family, 2 multi-family structures	Extreme	High
227 single-family, 4 two-three-family structures	High	High
4,325 single-family, 272 two-three-family, 129 multi-family structures	Moderate	High

## Economic Centers

Over 90 percent of the at-risk commercial properties, or 228 parcels, are located along Montauk Highway and within the Moderate risk area (see Table 19). Approximately 20 at-risk commercial properties are situated in Extreme and High risk areas south of Montauk Highway. In addition, there are over 30 industrial properties to the north of the communities adjacent to or near the Babylon Branch of the LIRR and within the Moderate risk area.

**Table 19. Economic Resources**

Asset/Resource	Risk Assessment Area(s)	Community Value
18 commercial properties	Extreme	Medium
2 commercial properties	High	Medium
228 commercial, 34 industrial properties	Moderate	Medium

### ii. 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 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 that assets 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 assets 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 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 Risk Assessment Tool was applied to, 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:

$$\text{Hazard} \times \text{Exposure} \times \text{Vulnerability} = \text{Risk}$$

The asset inventory provided a baseline to identify the most critical assets in the Community, which were then advanced through the 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)<sup>21</sup> in Moderate risk areas;
- Locally-significant community-identified (High Community Value) assets in Moderate risk areas;
- Assets with High Community Value in non-risk areas; and
- 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.



### Risk Assessment Results

The complete Asset Inventory Worksheet and corresponding Risk Assessment Tool data for the NYRCR Village of Babylon/West Babylon Community are provided in Section 5. The inventory catalogued approximately 50 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 and the waterfront. Other assets included transportation facilities, EMS resources, water utility locations, and natural resource systems, including the water bodies, creeks, and wetlands that form the Carlls River watershed.

The area south of Montauk Highway/Main Street is predominantly comprised of residential properties and marine-oriented uses, many of which are located on canals feeding into the Great South Bay. There is a significant quantity of housing, both in the Village of Babylon and West Babylon, 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 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 working sessions. Most recently, there was flooding throughout this area in January 2014 as a result of winter snowfalls and subsequent melting. More than a year after Superstorm Sandy this neighborhood is still recovering with homes in various states of construction (including elevation of homes). Other properties are for sale, abandoned, or in disrepair. 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 as resources situated south of Montauk Highway with adjacencies to the canals and those towards the Great South Bay generally scored in the Severe Risk range with some High Risk assets interspersed. Overall, the assets and systems with the highest risk scores included the Babylon Beach House Home for Adults, residential housing located in the Extreme risk area in the Village of Babylon and West Babylon, and Fred Shores Beach Club. The Babylon Beach House Home for Adults is a critical facility in that it serves a vulnerable population (senior residents). Additionally, the Committee identified the residential housing assets as a high value asset group. These risk scores are shown on the Risk Score Map below.

The Risk Table on the next page provides an identification number for each asset shown on the Risk Scores Map on page 44. 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 20: Assets at Risk**

ID#	Name
<b>Economic</b>	
1	Waterfront Commercial
2	Great South Bay Shopping Center
3	Babylon Village Dock
4	Venetian Yacht Club
5	Marina - Venetian Shores
6	Village Marina/Shore Road Slips - 210 boats
7	Babylon Village Commercial District
<b>Health and Social Services</b>	
8	Nuclear Cardiology - Radioactive Material
9	Babylon Child Care Center
10	Ambulance - EMT
11	St. Joseph Nursery School
12	Nuclear Cardiology - Radioactive Material
13	United Methodist Nursery School
14	Babylon Junior-Senior High School
15	West Babylon Fire Department - Station 3
16	Babylon Fire Station: Headquarters/Village Hall/DPW
17	Babylon Fire Dept.: Argyle Hose Company
18	Babylon Fire Department: Cedar St. Station
<b>Housing</b>	
19	Babylon Beach House - Home for Adults
20	West Babylon Residential Housing - Extreme Risk
21	Village Residential Housing - Extreme
22	Village Residential Housing - High
23	Village Residential Housing - Moderate Risk
24	West Babylon Residential Housing - High Risk
25	Sunrise Senior Living
26	W Babylon Residential Housing - Moderate
27	Options for Community Living Residential Home
28	Working Org of Retarded Children & Adults
29	Bayview Rest Home - Adults (Assisted Living)
30	East Neck Nursing & Rehab Center
<b>Infrastructure Systems</b>	
31	Microwave Tower, Venetian Shores Park
32	Secondary Streets - Extreme Risk
33	Suffolk County Sewer District - Radioactive Materials
34	LIPA Substation & Power Generation Facility
35	Bergen Point Sewage Treatment Plant
36	SCWA Treatment Plant and Wells
37	SCWA - Water Tank and Wells
38	State Hwy 27



Table 20 (cont'd)

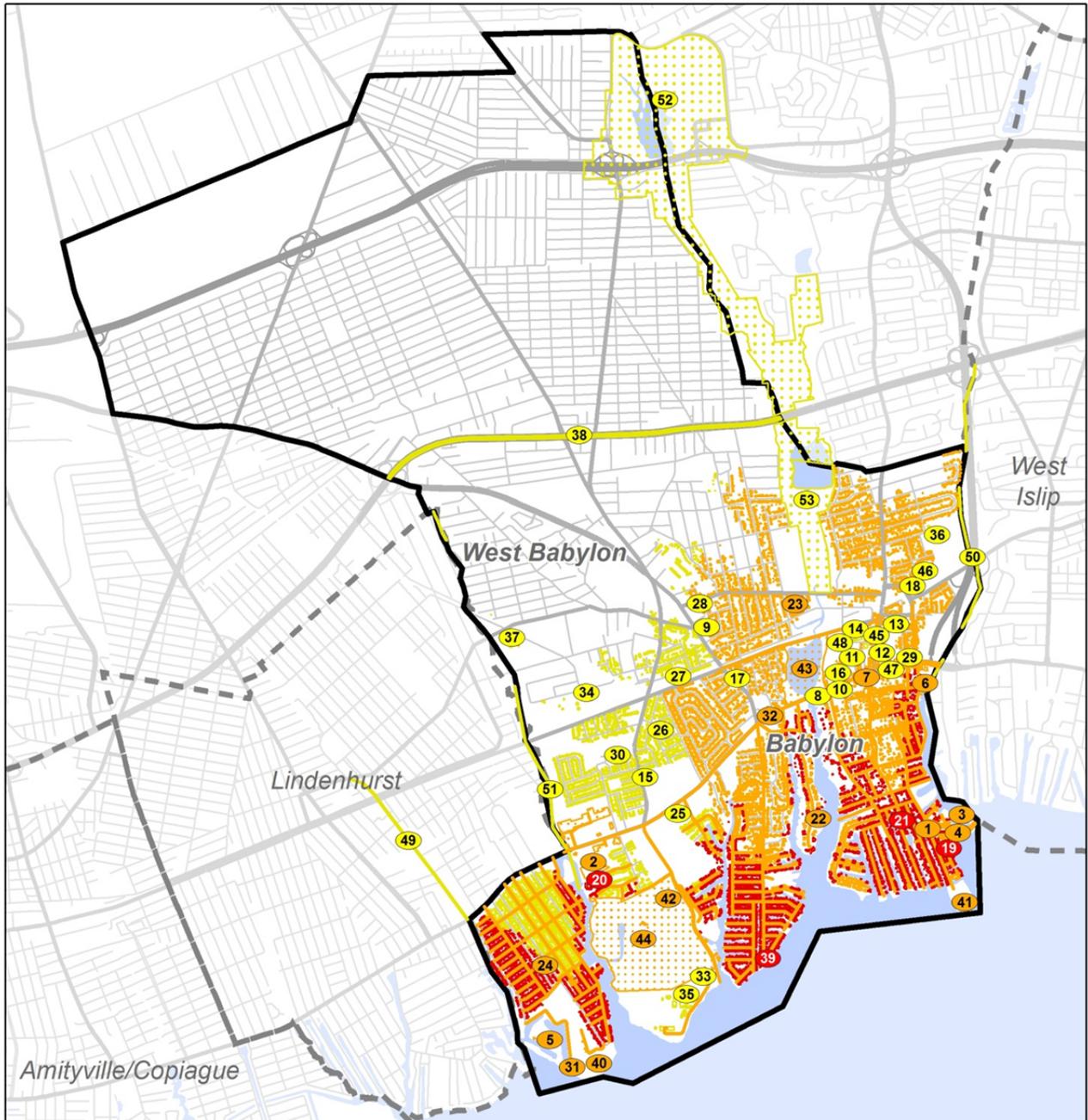
ID#	Name
<b>Natural and Cultural Resources</b>	
39	Fred Shore Beach Club
40	Venetian Shores Park
41	Babylon Village Pool
42	Bergen Point Golf Course & Harbor Club
43	Argyle Lake Park
44	Bergen Point County Park
45	American Legion Hall
46	LIPA Substation
47	First Presbyterian Church
48	St. Joseph's Roman Catholic Church
49	Neguntatogue Creek
50	Sampawams Creek
51	Santapogue Creek
52	Belmont Lake State Park
53	Southards Pond Park

**COLOR KEY:**

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



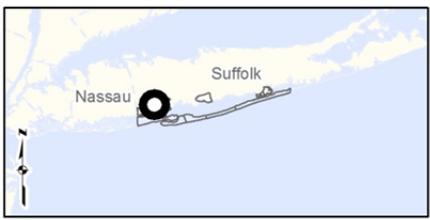
Figure 3: Risk Scores



	Severe Risk		Babylon-West Babylon NYRCR Planning Area
	High Risk		Other NYRCR Planning Areas
	Moderate Risk		
	Residual Risk		

0 0.25 0.5 Miles

Source: NYS DOT, NYS DOS, MTA





### Assessment of Needs and Opportunities

The Committee identified needs and opportunities based on the Community's reconstruction and economic growth goals, existing plans and studies, and the Community's overall vision for its future.

The term "need" is used here to illustrate infrastructure and services that were damaged or rendered inoperable by Superstorm Sandy, as well as operations that failed to work during the storm event or experienced insufficient capacity to respond effectively. During a disaster, many things can go wrong, such as communications breakdowns, equipment failure, infrastructure damage, and more. Considering what took place during the storm event, as well as what was damaged, provided the Committee with insights as to the inherent resiliency of structures, procedures, and operations. This assessment process led to a frank 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.

Opportunities are based on the idea that additional resiliency benefits, whether economic, environmental, social, or cultural, may be achieved by taking advantage of local assets and strengths, and by the integration of new methods, procedures, and materials in the 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.

Throughout this plan, projects and strategies are categorized by their Recovery Support Function (RSF). FEMA uses these RSFs to identify, coordinate, and ultimately deliver assistance to communities from several different funding sources available through the recovery effort—e.g., Federal, State, private, philanthropic, and not-for-profit. The "Economic Development" RSF, for example, brings together opportunities to achieve business recovery and resiliency through the projects identified by the Community (discussed further in Section 4).

The six Recovery Support Functions are:

- **Community Planning and Capacity Building:** Improving the Community's ability to both implement storm recovery activities and to plan to mitigate the effects of future storms.
- **Economic Development:** Returning economic and business activities to a state of health and developing new economic opportunities that result in a stronger, more resilient community.
- **Health and Social Services:** Restoring and potentially expanding public health programs, health care facilities and essential social services, especially for vulnerable populations.
- **Housing:** Assessing local housing conditions and associated risk levels during the re-building process, rebuilding and improving the resiliency of housing.
- **Infrastructure:** Investing in infrastructure to rebuild resources destroyed during the storm and to reduce future risks to critical assets.



- Natural and Cultural Resources: The rehabilitation, management, and protection of the natural and cultural resources that define the community’s physical and human character.

Below are the needs and opportunities identified by the Committee in each of the six RSF categories:

**Table 21. Village of Babylon and West Babylon Needs and Opportunities**

Community Planning and Capacity Building
<b>Need:</b> Update building codes, land use regulations, and design codes for green/resilient construction
<b>Need:</b> Public education and outreach programs that encourage pre-storm preparedness and resilient reconstruction
<b>Need:</b> Improve emergency evacuation preparedness and procedures
<b>Need:</b> Integrate the needs of the special needs population into laws, regulations and plans
<b>Opportunity:</b> Improve regional coordination with other emergency service providers, municipalities, and key institutional entities (i.e. schools, hospitals, etc.)
Economic Development
<b>Opportunity:</b> Strengthen Village downtown commercial district
<b>Opportunity:</b> Establish an identity and increase economic investment along the Montauk Highway corridor in West Babylon
<b>Opportunity:</b> Strengthen recreational areas
<b>Opportunity:</b> Strengthen tourism through innovative infrastructure
Health and Social Services
<b>Need:</b> Create a centrally-located, town-wide/regional emergency disaster facility to provide space for recovery organizations, supply storage and temporary sheltering
<b>Need:</b> Establish a Red-Cross Tier 1 shelter in a closer vicinity to the shoreline
<b>Need:</b> Develop a town-wide emergency communication system coordinated between government agencies, emergency personnel, schools, and the public
<b>Need:</b> Protect special needs populations
Housing
<b>Opportunity:</b> Develop codes, policies and incentives to encourage disaster-resilient housing
<b>Need:</b> Establish service to identify temporary housing following major storm events
<b>Opportunity:</b> Preserve of historic properties and structures
<b>Need:</b> Provide safe, resilient housing meeting the needs of the community



Table 21 (cont'd)

<b>Infrastructure</b>
<b>Need:</b> Repair, enhancement and/or relocation of infrastructure (dams, culverts, drainage, etc.) to reduce flooding
<b>Opportunity:</b> Acquire environmentally sensitive land in flood zones and watersheds to reduce exposure and provide flood and stormwater storage and mitigation
<b>Need:</b> Ensure that municipalities and first responders, including fire departments, have the necessary resources to prepare for and protect the public, property and the natural environment during and after disasters
<b>Need:</b> Improve communication before, during and after disasters
<b>Opportunity:</b> Use natural infrastructure (e.g., wetlands), to manage stormwater runoff
<b>Opportunity:</b> Strengthen Village downtown commercial district through innovative infrastructure
<b>Need:</b> Make electric supply more resilient
<b>Need:</b> Repair, replace, or enhance critical shoreline stabilization infrastructure
<b>Need:</b> Regionally, ensure continued operation of the Bergen Point Wastewater Treatment Plant
<b>Need:</b> Regionally, harden key utility and transportation infrastructure (e.g., electric, natural gas, LIRR ) to reduce future vulnerability
<b>Need:</b> Regionally, address storm surge on Long Island in regional context
<b>Natural and Cultural Resources</b>
<b>Opportunity:</b> Acquire environmentally sensitive land in flood zones and watersheds to reduce exposure and provide flood and stormwater storage and mitigation
<b>Need:</b> Restore/conservate natural resources (e.g., wetlands, dunes) to reduce vulnerability (both at the local and regional levels)
<b>Need:</b> Protect tidal wetlands and other natural resources (i.e. lakes, ponds, rivers, streams, etc.)

The following is a discussion of the needs and opportunities identified by the Committee members and the community at large within each RSF.

### Community Planning and Capacity Building

The community identified the need to update local building codes, land use regulations and design codes to encourage greater resiliency in preparation for future storms. In addition, increased public awareness of storm risks and the need for improved preparation, including evacuation plans, was an opportunity identified to provide overall improved public safety. The community identified the opportunity to address emergency preparedness through regional collaboration and the need to incorporate special needs population into local codes and regulations.

### Economic Development

The Village of Babylon downtown is a key commercial district for the south shore communities in western Suffolk County. The community identified the need to bolster infrastructure resiliency in the downtown area protecting the concentration of key assets while also identifying the opportunity to promote economic development and tourism. Similarly, West Babylon identified the opportunity for economic development along the Montauk Highway corridor in conjunction with infrastructure resiliency improvements.



### Health and Social Services

While the emergency response to Superstorm Sandy was excellent, the Community identified the need to better protect the health and safety of its residents during and after future storm events. One clear problem was the lack of an emergency shelter in the community in better proximity to the population most in need, i.e., closer to the coastal areas. The Community recognizes that such a facility will have to be located and designed to ensure minimal vulnerability. While the community mobilized within existing houses of worship, the American Legion, and the Beach Club pavilion, there were significant challenges during and after Superstorm Sandy related to finding space for recovery organizations and supplies, which hindered optimal response to residents in need.

The community identified the need for a regional Emergency Response/Rescue Facility including the provisions for temporary shelter in close proximity to the impacted residential areas.

### Housing

Overall, 23% of the housing stock in the Village of Babylon and 6% of the housing stock in West Babylon was damaged during Superstorm Sandy.<sup>22</sup> Within the Village of Babylon, approximately 38% of the households were constructed before 1950, 37% between 1950 and 1970, and 25% from 1970 to the present. In West Babylon, approximately 17% of the households were constructed before 1950, 54% between 1950 and 1970, and 28% from 1970 to the present. Many of these older structures pre-date current flood resistant design standards and were severely damaged. With over 70% of the homes in the NYRCR Village of Babylon/West Babylon Community constructed prior to 1970, there are significant opportunities to modernize homes to become more resilient to floods and wind storms. The Committee strongly supported efforts to encourage flood resistant designs that would minimize damage from future storms, such as the elevation of structures, the relocation of heating systems and electrical panels above projected flood levels, upgrading windows/doors/other openings, roof strapping, and overall reinforcing the structural integrity of the homes.

### Infrastructure

The impact of Superstorm Sandy on infrastructure was a significant focus of both the Committee and the residents of the Village of Babylon/West Babylon. The roads, drainage systems, electrical lines, and communication facilities were extensively impacted at a fundamental level, effecting both public safety and quality of life particularly in the neighborhoods south of Montauk Highway. The Community identified a clear need for emergency response rescue equipment upgrades and long term mitigation measures to address repetitive flooding that inhibits evacuation and rescue. While the Village commercial district was generally spared of flood impacts, recovery efforts were impacted due to long term power outages and natural gas being shut off.



The Community identified the need to harden electrical infrastructure and protect the power supply to key assets. Additionally, the Community identified the need to upgrade key tributary (lake, pond, river, stream, etc.) systems and shoreline roadways to mitigate future storm events and frequent flooding conditions.

### **Natural and Cultural Resources**

The NYRCR Village of Babylon/West Babylon Committee recognized the value of the natural environment by noting the area's coastal location and the importance of the Great South Bay and the Carlls River Tributary watershed to the identity, economy, and environment of both communities. While almost all of the land in both the Village of Babylon and West Babylon is developed, the Committee recognized the importance of protecting the remaining vacant, environmentally sensitive lands within flood zones as well. Also, the Committee recognized the importance of restoring and conserving existing wetlands to help reduce vulnerability to future storm events.



## Section 3: Reconstruction and Resiliency Strategies

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*Old Town Hall, Village of Babylon*



The process of identifying the NY Rising Community Reconstruction (NYRCR) Village of Babylon/Babylon Community's (Community) post-storm needs and opportunities informed the NYRCR Village of Babylon/Babylon Planning Committee's (Committee) development of strategies to resolve these needs and realize opportunities. In turn, the strategies helped conceptualize and design projects to specifically address these needs and opportunities.

Strategies are approaches to the conceptualization of projects, programs, policies, or other actions that specifically address an identifiable need. Typically, there are several strategies to address a given need. Communities are most successful when they blend traditional stabilization and repair actions with a holistic, long-range, forward-looking view of recovery and economic development. This section presents the strategies developed by the Committee for how best to use Community assets, capitalize on opportunities, and resolve critical issues.

For every need or opportunity, potential strategies were generated for each Recovery Support Function (RSF) with the goal of identifying strategies with benefits in multiple RSFs. Potential strategies span an array of methodologies and timeframes, from preparedness to retrofits, from immediate procedural improvements to long-range capital investments programs. Strategies may also include conservation of natural protective features, regulatory changes and building code updates, structural defenses, resilient retrofits, market measures, land use planning, and education and outreach in an effort 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 prioritizing the most effective and feasible strategies, and thus identify the highest and best use of Sandy recovery funds. These considerations included how each strategy relates to Superstorm Sandy's impacts on the Community; to what extent each strategy would reduce current and projected risk; whether it contributed to protection of vulnerable populations; feasibility of a successful implementation; compliance with existing regulations; upfront and long-term maintenance costs; direct and indirect benefits; and public perception and support.



### A. RECONSTRUCTION AND RESILIENCY STRATEGIES

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The Committee developed reconstruction and resiliency strategies that were derived from assets at risk relative to the Community's needs, as identified in the previous sections of this Plan. Each strategy was designed to take into account the following considerations:

1. Whether it reduced the level of risk and met an identified community need;
2. Whether it helped (or improved the resiliency of) vulnerable populations; and
3. Whether it could be implemented through discrete programs and/or projects.

The following pages will discuss the strategies developed by the Committee.



**STRATEGY: Strengthen And Harden Electrical Infrastructure To Protect Key Assets Within The Downtown Village Commercial District**

This strategy addresses resiliency issues related to Community Planning and Capacity Building, which relate to the community’s ability to both implement storm recovery activities and to plan to mitigate the effects of future storms. It also addresses the Infrastructure RSF, which relates to investment in infrastructure to re-build capabilities lost during the storm and reducing future risks to critical assets. This strategy addresses risk in the downtown commercial district of the Village of Babylon by providing ongoing electrical power during and after a storm event, thus allowing for the continuous operation of key assets such as the Village Hall, fire houses, schools, places of worship and businesses. Such facilities, where operational, served a number of critical roles during Superstorm Sandy, including the provision of disaster recovery operations, emergency shelter, distribution of food, water, and other supplies, and the dissemination of information. In addition to providing relief services, these facilities in the downtown also serve as meeting places for communal support and cooperation during disasters. Providing uninterrupted electrical power ensures multiple co-benefits for infrastructure resiliency, health and social services, and economic development. There is one proposed and one featured project that were developed to implement this strategy: a Microgrid Engineering Feasibility Study and the implementation of a Microgrid system within the Village of Babylon, respectively.

Project Name	Short Description	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
Microgrid Engineering Feasibility Study	Prepare engineering feasibility study to define scale, infrastructure requirements, ownership, capital costs, and operational requirements/costs associated with proposed microgrid implementation.	\$50,000	Proposed	N
Microgrid Implementation	Implementation of the microgrid infrastructure. The Engineering Study performed will determine energy infrastructure details, transmission, limits of distribution, ownership, operations, etc.	\$10,000,000	Featured	N



**STRATEGY: Strengthen Community Resiliency through the Implementation of Innovative Infrastructure Improvements**

This strategy addresses resiliency issues related to Economic Development and Infrastructure. It is closely linked to the Economic Development RSF, which focuses on returning economic and business activities to a state of health and developing new economic opportunities that result in a stronger, more resilient community. The strategy promotes economic development by attracting new businesses that create jobs and promote vitality. Economic resiliency is an important component of preparedness and response to natural disasters; economically viable, prosperous communities recover more quickly to the impacts of storms owing to their ability to quickly deploy capital and other resources. There is one proposed and one featured project that were developed to implement this strategy through two phases of a Babylon Village Complete Streets Green Infrastructure Project. The projects developed for this strategy have several community co-benefits, including enhanced stormwater management with the use of permeable pavement and rain garden treatments as well as public health benefits from increased physical activity and recreational opportunities.

Project Name	Short Description	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
Complete Streets Engineering Study and Pilot Green Infrastructure	The first phase of this project would involve the preparation of an engineering study to develop a comprehensive scope for a “Complete Streets” project strengthening the connection between Main Street and the Village waterfront. The pilot scope would include the construction of Permeable Pavement Treatments at key intersection(s) and adjacent rain garden treatments along the route between Main Street and Village waterfront.	\$250,000	Proposed	N
Complete Streets Infrastructure Project	Implementation of a comprehensive menu of innovative/green stormwater infrastructure components and complete streets improvements including permeable pavement treatments, bicycle lanes, trolley service, LED lighting and streetscape improvements strengthening the connection between Main Street and the Village waterfront.	\$3,000,000	Featured	N



**STRATEGY: Create Hamlet Identity for West Babylon**

This strategy works towards the objectives outlined for the Economic Development and Infrastructure RSFs. Specifically, this strategy promotes economic development by creating a centralized downtown identity for West Babylon, which will help to attract new businesses, create jobs, and promote community vitality. The strategy promotes the development of essential long-term economic resiliency for the West Babylon hamlet, and offers an opportunity to use land along Montauk Highway for green stormwater management purposes. Green infrastructure will help to facilitate future development and economic growth while increasing interaction and activity within the community. There is one proposed project and one featured project that were developed to implement this strategy, which include the first and second phases of a West Babylon Hamlet Open Space Acquisition and Stormwater Engineering Study and Green Infrastructure Project. The projects developed for this strategy have several community co-benefits including enhanced stormwater management with the creation of stormwater wetlands and passive parks as well as public health benefits from increased physical activity and recreational opportunities.

Project Name	Short Description	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
West Babylon Hamlet Open Space Acquisition and Stormwater Engineering Study and Green Infrastructure Project	The initial phase of this project would involve the preparation of an engineering study to develop the scope of an innovative open space/stormwater infrastructure project with an initial pilot scope of rain gardens/bioswales and combined stormwater/street tree structures in the vicinity of Bergen Avenue and Montauk Highway.	\$250,000	Proposed	N
West Babylon Hamlet Open Space Acquisition and Stormwater Park	Subsequent to property acquisition, the project scope would include the construction of a stormwater wetland/open space park, which would provide enhanced stormwater quality treatment and management and passive park improvements.	\$5,000,000	Featured	N



**STRATEGY: Adequately Equip Municipalities and First Responders for Natural Disasters**

This strategy calls for improved equipment for municipalities and first responders, which will represent an investment that satisfies the objectives of the Infrastructure RSF. Existing emergency equipment and disaster relief facilities were insufficient to meet the Community’s needs during and after Superstorm Sandy. Without access to a high-water truck or adequate rescue boats, many first responders were forced to wade through flood waters to reach stranded victims during the storm. The strategy addresses risk for the Village of Babylon and the entire Town of Babylon by providing essential equipment and materials for emergency responders and municipal personnel for rescue operations and addressing hazards. The strategy ensures that municipalities and first responders will have the resources to aid persons in urgent need of rescue or medical assistance, particularly the elderly or persons with disabilities who are unable to evacuate on their own during an emergency, which represent vulnerable populations. The following projects were developed to implement this strategy:

Project Name	Short Description	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
Village of Babylon Emergency Response and Rescue Equipment and Fixed Generators	Purchase of specialized emergency response equipment and disaster recovery equipment to address existing equipment deficiencies and to facilitate a greater capacity of services and improved response during and after events. Additionally, fixed generators will provide continuous operations to deliver optimal emergency response services.	\$919,000	Proposed	N
Village of Babylon Department of Public Works Fixed Generator	Purchase and install fixed generator for backup power at the Village of Babylon Department of Public Works building.	\$200,000	Proposed	N
West Babylon Fire Department Emergency Response and Rescue Equipment	Purchase of specialized emergency response equipment and disaster recovery equipment to address existing equipment deficiencies and to facilitate a greater capacity of services and improved response during and after events.	\$180,000	Proposed	N
Town of Babylon Division of Fire Prevention Emergency Response and Rescue Equipment	Purchase of specialized emergency response equipment and disaster recovery equipment to address existing equipment deficiencies and to facilitate a greater capacity of services and improved response during and after events.	\$1,005,000	Proposed	Y



Project Name	Short Description	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
Cedar Street Property Acquisition and Construction Of Emergency Equipment Garage – Babylon Fire Department	Acquire property adjacent to the Cedar Street Fire House and construct a new garage facility addressing the lack of storage for specialized emergency equipment and facilitating emergency response and mobilization of equipment.	\$700,000	Proposed	N
West Babylon Fire Department EMS Facility	Construct a freestanding EMS Building directly adjacent to the West Babylon Firehouse.	\$1,000,000	Proposed	N



**STRATEGY: Integrate “Green” and “Gray” Infrastructure to Holistically Manage Water Flow within the Local Watershed**

This strategy addresses resiliency issues related to the Infrastructure RSF. The strategy optimizes and enhances stormwater management infrastructure in flood hazard zones. The strategy addresses risk for the entire Town of Babylon by reducing potential flood-related damage to structures and infrastructure in flood-prone neighborhoods and districts.

During Superstorm Sandy, significant flooding occurred not only along the vulnerable coastal areas, but also along the northern end of the Town of Babylon. To the north, flooding occurred at the base of Argyle Lake and along the entire north-south Carlls River tributary including Southards Pond and Elda Lake. In the coastal areas, storm surge elevation rose to levels above shoreline bulkheads and road elevations.

Because Superstorm Sandy has been characterized as a relatively “low rain/precipitation event,” if rainfall amounts were similar to Hurricane Irene, flooding impacts to the community would have been tremendously increased. This strategy addresses this risk and need by holistically using green and gray infrastructure systems along the watershed to more effectively channel, control, and manage stormwater during high-precipitation storm events.

The following three proposed projects and two featured projects were developed to implement this strategy:

Project Name	Short Description	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
Carlls River Tributary/ Watershed Project (Phase I)	This is a multi-component infrastructure project that involves elements of flood gate/controls at Argyle Lake and Southards Pond and comprehensive dam repairs at Argyle Lake. Dam repairs at Elda Lake and the construction of stormwater wetlands at NYS Route 27 and Carlls River are also integral components of the initial proposed project phase implementation.	\$3,505,000	Proposed	N
Carlls River Tributary/ Watershed Project (Phase II)	This project scope is the next phase of key infrastructure upgrades including the replacement of key culvert crossings and the expansion/widening of the LIRR culvert opening. This phase would also include the construction of stormwater wetlands at Carlls River NYS Parkland (filled wetlands) just south of Elda Lake.	\$3,000,000	Featured	N



Project Name	Short Description	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
Town-wide and Village-wide Coastal Outfall Backflow Infrastructure	This project will install in-line backflow valve infrastructure at 51 coastal outfalls into the Great South Bay and adjoining canals. Twenty-six (26) outfall locations will be implemented in the Village and twenty-five (25) locations within the West Babylon hamlet area.	\$1,605,000	Proposed	Y
West Babylon Hamlet Open Space Acquisition and Stormwater Engineering Study and Green Infrastructure Project	The initial phase of this project would involve the preparation of an engineering study to develop the scope of an innovative open space/stormwater infrastructure project with an initial pilot scope of rain gardens/bioswales and combined stormwater/street tree structures in the vicinity of Bergen Avenue and Montauk Highway.	\$250,000	Proposed	N
West Babylon Hamlet Open Space Acquisition and Stormwater Park	Subsequent to property acquisition, the project scope would include the construction of a stormwater wetland/open space park, which would provide enhanced stormwater quality treatment and management and passive park improvements.	\$5,000,000	Featured	N



**STRATEGY: Improve the Reliability of Communication Systems for Natural Disasters**

This strategy addresses resiliency issues related to the Infrastructure RSF. The strategy improves and links local emergency communication systems among the Village, Town, and Suffolk County Office of Emergency Management, helping to coordinate responses to emergencies, provide timely status updates, and assist in recovery efforts.

Communications were impacted during Superstorm Sandy, particularly those between first responders and other emergency service providers. This strategy seeks to upgrade and improve communication infrastructure to address one of the most important deficiencies identified during Superstorm Sandy. These communication improvements are critical to saving lives and protecting property during emergency events.

There is one proposed project that was developed to implement this strategy, which is the Babylon Central Alarm - Upgrades to Communications Infrastructure. In addition, please see Table 22 in Section 5 for more information on Additional Resiliency Recommendations.

Project Name	Short Description	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
Babylon Central Alarm - Upgrades to Communications Infrastructure	This project includes critical upgrades to the existing communications infrastructure serving ten (10) Fire Departments within the Town of Babylon.	\$257,000	Proposed	Y



**STRATEGY: Repair and Enhance Critical Shoreline Infrastructure**

This strategy works towards the objectives of the Infrastructure and Natural and Cultural Resources RSFs, helping to reduce future risks to critical assets and providing for the rehabilitation, management, and protection of resources that define the community’s physical and human character. The strategy promotes coordination among relevant agencies and municipalities to prevent shoreline loss due to erosion. By reducing erosion and flooding, this strategy also protects structures—particularly residential housing, senior and assisted-living facilities, and roadway infrastructure—near the shore that are susceptible to storm surge and wave action. Repairing shoreline infrastructure also increases the resiliency of important recreational and natural assets that serve the entire general population for the Town of Babylon. In addition, please see Table 22 in Section 5 for more information on Additional Resiliency Recommendations.

Project Name	Short Description	Estimated Cost	Proposed or Featured Project	Regional Project (Y/N)
Araca Road (Dalton Point) Shoreline Stabilization	This project will preserve key open space parcels, proposed to be acquired by the Village, located on both sides of the terminus of Araca Road by stabilizing the shoreline and the terminus of Araca Road along the Great South Bay.	\$925,000	Proposed	N
Little East Neck Road Shoreline Stabilization	A combination of bulkhead treatments with living shoreline treatments will protect the road integrity, mitigate erosion, and provide property stabilization.	\$457,000	Proposed	N
Venetian Shores Park Shoreline Engineering Study and Pilot Constructed Dune Project	The first component of this project is the preparation of an engineering study to develop innovative long-term shoreline stabilization improvements. The Pilot project scope would include the construction of engineered planted dunes.	\$179,500	Proposed	Y
Town-wide and Village-wide Coastal Outfall Backflow Infrastructure	This project will install in-line backflow valve infrastructure at 51 coastal outfalls into the Great South Bay and adjoining canals. Twenty-six (26) outfall locations will be implemented in the Village and twenty-five (25) locations within the West Babylon hamlet area.	\$1,610,000	Proposed	Y



## Section 4: Implementation - Project Profiles

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*Main Street, Village of Babylon*



### Introduction

This section provides a complete Project Profile for each Proposed or Featured Project identified by the New York Rising Community Reconstruction (NYRCR) Planning Committee (Committee) and the NYRCR Village of Babylon/West Babylon Community (Community). In addition to providing a detailed description of each project, the profiles include information on two important elements used by the Committee to evaluate the merits of each project—a Cost-Benefit Analysis and a Risk Reduction Analysis.

The NYRCR Program has allocated to the Community up to \$10.1 million (Village of Babylon: \$6.2 million; West Babylon: \$3.9 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, Planning Committees took into account cost estimates, cost-benefit analyses, the effectiveness of each project in reducing risk to populations and critical assets, feasibility, and community support. Planning Committees also considered the potential likelihood that a project or action would be eligible for CDBG-DR funding. The projects and actions set forth in the NYRCR Plan are divided into three categories. The order in which the projects and actions are listed in the NYRCR Plan does not necessarily indicate the Community's prioritization of these projects and actions. Proposed Projects are projects proposed for funding through the Community's allocation of CDBG-DR funding. Featured Projects are projects and actions that the Planning Committee has identified as important resiliency recommendations and has analyzed in depth, but has not proposed for funding through the NYRCR Program. Additional Resiliency Recommendations (see Section V) are projects and actions that the Planning Committee would like to highlight and that are not categorized as Proposed Projects or Featured Projects. The total cost of Proposed Projects in the NYRCR Plan exceeds the NYRCR Community's CDBG-DR allocation to allow for flexibility if some Proposed Projects cannot be implemented due to environmental review, HUD eligibility, technical feasibility, or other factors. Implementation of the projects and actions found in the NYRCR Plan are subject to applicable Federal, State, and local laws and regulations, including the Americans with Disabilities Act (ADA). Inclusion of a project or action in the NYRCR Plan does not guarantee that a particular project or action will be eligible for CDBG-DR funding or that it will be implemented.

### Cost-Benefit Analysis

A cost-benefit analysis (CBA) is a tool used to determine 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 and identification of projects for implementation; and (2) to support grant applications for funding.



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 that are implemented. With this in mind, the CBA has used a combination of both quantitative and qualitative factors in its analysis.

The CBA cannot, however, evaluate costs and benefits with complete certainty; rather, it provides the community with a practical understanding of the potential estimated costs of project implementation and the potential benefits accrued to the community with the particular project in place. The costs and benefits used to evaluate projects through the CBA are explained further below.

### Project Costs

Project Profiles include a detailed breakdown of all anticipated costs, both short-term and long-term (e.g., construction, operation and maintenance costs, as well as overall life-cycle costs) based on pre-design project conceptualization, informed by comparable projects.

The cost of implementing a project is just one aspect of the justification for funding these Proposed Projects. Another important variable is the future costs of not implementing these projects -- which have the potential to negatively impact the long-term viability of both the Village and its neighboring South Shore communities. 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”).<sup>23</sup>
- **Economic Resiliency:** The project’s potential to help minimize damage to the local economy and to 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.<sup>24</sup>
- **Health, Social and Public Safety Services:** Qualitative information was provided on the overall population benefits of improved access to health and social service facilities and public safety



services; type and size of socially vulnerable population secured;<sup>25</sup> 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, threatened and endangered species, migration or habitat connectivity; any clean-up resulting from the action; creation of open space or a new recreational asset

### Risk Reduction Analysis

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 reduces 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 helps communities and decision-makers understand the potential environmental, social, and economic outcomes associated with implementing a project. (For a more detailed discussion of the methodology and factors used in the Risk Reduction Analysis, see Section 5.)



## **PROPOSED PROJECT: Village Of Babylon Fire Department – Emergency Response & Rescue Equipment & Fixed Generators**

### **Project Description**

This project involves the purchase of specialized emergency response and disaster recovery equipment to address existing equipment deficiencies and to facilitate a greater capacity of services and improved response during and after emergency storm events. Emergency equipment will address land and water rescue operations. Existing equipment was insufficient to meet the community needs during and after Superstorm Sandy. Additionally, fixed generators will provide continuous operations to deliver optimal emergency response services. Equipment would include:



***Military Surplus High Water Rescue Truck***  
*(Photo Credit: Scott Glenn, Babylon Fire Department)*

- a. (1) 5-7 ton military surplus high water rescue truck
- b. (2) Rigid inflatable boats with outboard engines
- c. (20) Exposure/survival suits
- d. (1) Kawasaki 70 Payloader
- e. (2) 900 series military surplus high water dump truck with plow
- f. (1) Fixed generator for Main Firehouse/Village Hall
- g. (1) Fixed generator for Cedar Street Firehouse

This project has high feasibility and no technical challenges are anticipated for implementation of this project. The Village of Babylon Fire Department would have to complete purchase orders for the

### **Village Of Babylon Fire Department – Emergency Response & Rescue Equipment & Fixed Generators**

***Recovery Support Function:***  
Infrastructure

***Estimated Cost:*** \$919,000

***Assets Made More Resilient:***  
Babylon Village Hall, Fire Department Headquarters, Cedar Street Firehouse

***Risk Reduction & Benefits:***  
Improved emergency response efforts  
Reduced emergency response times during extreme weather events  
Increased resiliency of key assets due to continuous power



equipment identified. No real property acquisition or additional constraints were identified. However, implementation of the Cedar Street acquisition and construction project (see project profile below) would allow for the long-term storage of purchased equipment.

### Estimated Project Costs

The total estimated cost for this proposed project is \$919,000. The capital cost to purchase the identified emergency equipment is estimated at \$394,000. The capital cost to purchase the generators is estimated at \$525,000.

As an additional consideration, ongoing operations and maintenance for the total useful life of the equipment is estimated to be \$150,000. The operations and maintenance costs were calculated using the assumption of \$5,000 per year for a total useful life of 30 years. Ongoing operations and maintenance for the total useful life of the generators is estimated to be \$156,000. The operations and maintenance costs were calculated using the assumption of \$3,900 per year for a total useful life of 20 years. (Note: Estimate includes the costs of engineering services.)



***Babylon Fire Department Rescue Boat***  
*(Photo Credit: Scott Glenn, Babylon Fire Department)*

### Project Benefits

#### ***Risk Reduction Benefits***

Properly equipping first responders will reduce the risk of injury and death to residents as well as the responders themselves. The ability to provide continuous power to critical operations increases the resiliency of the entire community by providing the ability to begin and sustain recovery operations within a short period of time.



### ***Health and Social Benefits***

It is vital to the health and safety of all residents in the Village of Babylon that the Fire Department has the capacity to respond and serve all affected areas during and following a disaster. Community safety and preparedness are contributing factors to the overall quality of life in this community; therefore, there will be positive social benefits to procuring the necessary equipment for community resiliency.

### **Cost Benefit Analysis**

The Village of Babylon recognizes the inefficiencies and shortcomings of their currently available emergency facilities and rescue equipment as demonstrated by the aftermath of Superstorm Sandy and are seeking the necessary life-saving equipment for handling future events. At a cost of \$919,000, the project will have numerous benefits including decreased vulnerability to prolonged recovery, and health and social benefits to all members of the community. This analysis demonstrates that the benefits outweigh the costs making the project justifiable and appropriate.

### **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. Yet the project still increases resiliency throughout the Community as residents, business owners, and the first responders in the area will benefit from increased preparedness and decreased response times. Enhancing the capacity of the Fire Department to respond to affected areas during an emergency event will also help to mitigate property loss or damage for many assets throughout the Village.

### **General Timeframe for Implementation**

It is estimated that, from the time implementation begins, this proposed project could be implemented in the near-term (0 to 12 months). Bid documents will be prepared and vendor(s) will be selected (2 months). While most of the project items are straightforward purchases, the fixed generators will have to be installed at the Main Firehouse/Village Hall and the Cedar Street Firehouse. The installation of the fixed generators will take approximately 1-2 months, depending on time of year, weather, or other variable factors.

### **Regulatory Requirements Related to Project**

No permitting or approvals are anticipated to be required for this project.

### **Jurisdiction**

Village of Babylon



## ***PROPOSED PROJECT: Village of Babylon Department of Public Works – Fixed Generator***

### **Project Description**

This proposed project involves the purchase and installation of a fixed generator for backup power at the Village of Babylon Department of Public Works building. The loss of power at critical facilities was a major issue during Superstorm Sandy, affecting the ability of the Village to respond to emergency concerns and problems. This Proposed Project is categorized under Community Planning and Capacity Building, as it will increase the capacity of the Village to respond to and recover from emergency situations. No technical challenges or property constraints were identified for the implementation of this project.



***Sample Fixed Emergency Generator***

### **Estimated Project Costs**

The total estimated cost for this proposed project is \$200,000.

As an additional consideration, ongoing operations and maintenance for the total useful life of the generator is estimated to be \$78,000. The operations and maintenance costs were calculated using the assumption of \$3,900 per year for a total useful life of 20 years. (Note: Estimate includes the costs of engineering services.)

### **Village of Babylon Department of Public Works – Fixed Generator**

***Recovery Support Function:***  
Infrastructure

***Estimated Cost:*** \$200,000

***Assets made more Resilient:***

Babylon Village Department of  
Public Works

***Risk Reduction & Benefits:***

Increased resiliency by providing  
the Department with continuous  
power



### Project Benefits

#### **Risk Reduction Benefits**

The installation of a generator at the Village of Babylon Department of Public Works (DPW) will increase the resiliency of the DPW by supplying continuous power during an outage 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.

#### **Cost-Benefit Analysis**

The proposed equipment purchases have been analyzed in terms of their costs and benefits. At a cost of \$200,000, the project will have numerous benefits including decreased vulnerability to prolonged recovery, and increasing the capacity of the Village of Babylon Department of Public Works to provide critical services during emergency situations. This analysis demonstrates that the benefits outweigh the costs making the project justifiable and appropriate.

#### **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. The proposed project is anticipated to reduce the vulnerability of the Babylon Village Department of Public Works building by securing continuity of service after an emergency event. The project also increases resiliency throughout the Community, as residents, business owners, and the first responders in the area will benefit from increased preparedness and delivery of critical services. Enhancing the capacity of the DPW to respond to affected areas during an emergency event will also help to mitigate property loss or damage for many assets throughout the Village.



*Village of Babylon Department of Public Works*

#### **General Timeframe for Implementation**

It is estimated that, from the time implementation begins, this proposed project could be implemented in the near-term (0 to 12 months). Bid documents will be prepared and vendor(s) will be selected (2 months). The fixed generator will have to be installed at Village of Babylon Department of Public Works, which will take approximately 1-2 months, depending on time of year, weather, or other variable factors.

#### **Regulatory Requirements Related to Project**

The Village of Babylon would have to approve a purchase order for the fixed generator and associated infrastructure improvements.

#### **Jurisdiction**

Village of Babylon



## **PROPOSED PROJECT: West Babylon Fire Department – Emergency Response & Rescue Equipment**



**West Babylon Fire Department Headquarters**  
(Photo Credit: Ellen McArdle, West Babylon Fire District)

### **West Babylon Fire Department – Emergency Response & Rescue Equipment**

**Recovery Support Function:** Infrastructure

**Estimated Cost:** \$180,000

**Assets Made More Resilient:** West Babylon  
Fire Department Headquarters

#### **Risk Reduction & Benefits:**

Increased resiliency of key assets by  
providing emergency services with  
continuous power.

Improved emergency response efforts

Reduced emergency response times during  
extreme weather events

### **Project Description**

This project involves the purchase of specialized emergency response and disaster recovery equipment to address existing equipment deficiencies and to facilitate a greater capacity of services and improved response during and after events. Emergency equipment will address land and water rescue. Equipment would include:

- a. (1) 5-7 ton military surplus high water rescue truck
- b. (1) Argo ATV all-terrain/amphibious vehicle
- c. (2) Rigid inflatable boats with outboard engines
- d. (2) 14' flat bottom aluminum dorys/skiffs
- e. (2) Portable fire pumps
- f. (6) Portable generators (>5,000 watts)
- g. (20) Exposure/survival suits
- h. (30) Chainsaws



The equipment identified is rescue and life-saving equipment. Existing equipment was insufficient to meet the community needs during and after Superstorm Sandy. This project has a high feasibility and no technical challenges are anticipated for implementation of this project. The West Babylon Fire Department would have to complete purchase orders for the fixed generator. No real property acquisition or additional constraints were identified.

### **Estimated Project Costs**

The total estimated cost for this proposed project is \$180,000.

As an additional consideration, ongoing operations and maintenance for the total useful life of the equipment is estimated to be \$150,000. The operations and maintenance costs were calculated using the assumption of \$5,000 per year for a total useful life of 30 years.

### **Project Benefits**

#### ***Risk Reduction Benefits***

The specialized emergency response equipment and disaster recovery equipment will address existing equipment deficiencies and facilitate both greater capacity of services and improved response during and after events. Emergency equipment will address land and water rescue operations, thereby reducing risk, particularly for areas and assets that were inaccessible due to Sandy floodwaters.

#### ***Health and Social Benefits***

It is vital to the health safety of all residents in the hamlet that the Fire Department has the capacity to respond and serve all areas affected during and following a disaster. During Superstorm Sandy, the Fire Department was incapable of reaching certain areas of West Babylon due to high floodwaters, putting lives at risk of from numerous public health threats and environmental exposures.

### **Cost Benefit Analysis**

The West Babylon Fire Department recognizes the inefficiencies and shortcomings of their currently available emergency and rescue equipment as demonstrated by the aftermath of Superstorm Sandy and are seeking the necessary life-saving equipment for handling future events. The proposed equipment purchases have been analyzed in terms of their costs and benefits. At a cost of \$180,000, the project will have numerous benefits including decreased vulnerability to prolonged recovery, and health and social benefits to all residents of the hamlet of West Babylon. This analysis demonstrates that the benefits outweigh the costs making the project justifiable and appropriate.



### **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. Yet the project still increases resiliency throughout the Community as residents, business owners, and the first responders throughout the hamlet of West Babylon will benefit from increased preparedness and decreased response times. Enhancing the capacity of the Fire Department to respond to affected areas during an emergency event will 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 could be implemented in the near-term (0 to 12 months). Bid documents will be prepared and vendor(s) will be selected (2 months). Most of the project items are straightforward purchases that will not require installation or contracting services.

### **Regulatory Requirements Related to Project**

No permitting or approvals are anticipated to be required for this project.

### **Jurisdiction**

Town of Babylon



## **PROPOSED PROJECT: Town Of Babylon Division of Fire Prevention - Emergency & Rescue Equipment**

### **Project Description**

This project involves the purchase of specialized emergency response equipment and disaster recovery equipment to address existing equipment deficiencies and to facilitate a greater capacity of services and improved response during and after events. Emergency equipment will address land and water rescue operations and specialized operations of propane/fuel tank recovery and spill response. Equipment would include:

- a) (1) Pay loader
- b) (2) 5-7 ton military surplus high water rescue trucks
- c) (1) Compact utility loader
- d) (1) Humvee pickup with boom
- e) (3) Humvee military surplus trucks
- f) (1) Utility truck with boom and winch
- g) (1) Boat for debris recovery operations and salvage equipment

### **Town Of Babylon Division of Fire Prevention - Emergency & Rescue Equipment**

**Recovery Support Function:**  
Infrastructure

**Estimated Cost:** \$1,005,000

**Assets Made More Resilient:** Town of Babylon Division of Fire Prevention

**Risk Reduction & Benefits:**

Increased resiliency of key assets by providing emergency services with continuous power

Improved emergency response efforts

Reduced emergency response times during extreme weather events



**Fuel Tank Recovery Efforts**  
(Photo Credit: Rich Groh, TOB DEC)

The equipment identified is rescue and life-saving equipment. Existing equipment was insufficient to meet the community needs during and after Superstorm Sandy. The Town’s Division of Fire Prevention is independent (no relationship) from both the Village Fire Department and the West Babylon Fire Department. The Town’s Division of Fire Prevention covers a larger geographic area for all unincorporated areas of the Town and functions in concert with the local fire departments providing specialized rescue and life-saving services.



This project has a high feasibility and no technical challenges are anticipated for implementation of this project. The Town of Babylon would have to complete purchase orders for the identified equipment. No real property acquisition or additional constraints have been identified.

### Estimated Project Costs

The total estimated cost for this proposed project is \$1,005,000.

As an additional consideration, ongoing operations and maintenance for the total useful life of the equipment is estimated to be \$150,000. The operations and maintenance costs were calculated using the assumption of \$5,000 per year for a total useful life of 30 years.

### Project Benefits

#### ***Risk Reduction Benefits***

The specialized fire emergency response equipment and disaster recovery equipment will address existing equipment deficiencies and facilitate both greater capacity of services and improved response during and after events. Equipment included will address the specialized operations of propane tank and fuel tank recovery and spill response, which was a major issue during and after Superstorm Sandy.

#### ***Health and Social Benefits***

The project would enhance the capacity of the Town of Babylon Division of Fire Protection. It is vital to the health safety of all residents in the Town that the Division of Fire Protection has the capacity to respond and serve all areas affected during and following a disaster. During Superstorm Sandy, the Division of Fire Protection was incapable of reaching certain areas of the Town of Babylon due to high floodwaters, putting lives at risk of from numerous public health threats and environmental exposures.

### Cost Benefit Analysis

The Town of Babylon Division of Fire Prevention recognizes the inefficiencies and shortcomings of their currently available emergency and rescue equipment as demonstrated by the aftermath of Superstorm Sandy and are seeking the necessary life-saving equipment for handling future events. The proposed equipment purchases have been analyzed in terms of their costs and benefits. At a cost of \$1,005,000, the project will have numerous benefits including decreased vulnerability to prolonged recovery, and health and social benefits to all residents of the Town of Babylon. This analysis demonstrates that the benefits outweigh the costs making the project justifiable and appropriate.



### **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. Yet the project still increases resiliency throughout the Community as residents, business owners, and the first responders throughout the Town of Babylon will benefit from increased preparedness and decreased response times. Enhancing the capacity of the Department of Fire Prevention to respond to affected areas during an emergency event will 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 could be implemented in the near-term (0 to 12 months). Bid documents will be prepared and vendor(s) will be selected (2 months). Most of the project items are straightforward purchases that will not require installation or contracting services.

### **Regulatory Requirements Related to Project**

No permitting or approvals are anticipated to be required for this project.

### **Jurisdiction**

Town of Babylon



## **PROPOSED PROJECT: Microgrid Engineering Feasibility Study – Babylon Village**

### **Project Description**

This project involves the preparation of an engineering feasibility study to define the scale, infrastructure requirements, ownership, capital costs, and operational requirements and costs associated with microgrid implementation. The Village of Babylon downtown area was subject to inundation and flooding from Superstorm Sandy and was without electricity for an extended period of time. A microgrid project would enhance resiliency of key assets within the Village downtown center by providing independent, uninterrupted electrical power when and if the main electrical grid goes off-line. The key assets anticipated to be part of a microgrid project include the Village Hall, Fire Department Headquarters, Village DPW, Babylon Jr/Sr High School Complex, American Legion, St. Joseph Church complex, First Presbyterian Church and other key commercial/institutional businesses. Subject to the findings of the engineering study, another asset to be included within the microgrid could be the Bayview Rest Home, an assisted living facility on Main Street.

This project is classified under Community Planning and Capacity Building as this action is a study to determine the feasibility and cost associated with development of a microgrid to serve key facilities within the Village that are necessary for disaster resiliency and recovery. This project is also classified as fulfilling other recovery support functions, including Infrastructure Strategies, Health and Social Services, and Economic Development. No technical challenges or property constraints are anticipated for implementation of this project. The project is an engineering study and therefore has high feasibility.

### **Estimated Project Costs**

\$50,000

### **Microgrid Engineering Feasibility Study – Babylon Village**

**Recovery Support Function:** Community Planning and Capacity Building

**Estimated Cost:** \$50,000

**Assets Made More Resilient:** Babylon Village Hall, Fire Department Headquarters, Babylon Village DPW, Babylon Jr/Sr High School Complex, American Legion, St. Joseph Church complex, First Presbyterian Church and other key commercial/institutional businesses in the Village of Babylon

#### **Risk Reduction & Benefits:**

Enhanced resiliency of key assets by providing independent, uninterrupted electrical power

Environmental benefits through the delivery of clean energy

Increased resilience of vulnerable populations, particularly in assisted living facilities



**Sample fuel cell microgrid**  
(Photo Credit: FuelCell Energy Inc.)

## Project Benefits

### **Risk Reduction Benefits**

It is anticipated that the implementation of the microgrid project will enhance resiliency of key assets within the Village downtown center by providing independent, uninterrupted electrical power when the main electrical grid goes off-line and therefore reduce the vulnerability of emergency response services and maintain operation of a critical mass of key assets necessary during a natural disasters as well as during disaster recovery.

**Figure 4: Conceptual Microgrid Exhibit**



### **Economic Benefits**

It is anticipated that the entire community, including local business owners in downtown Babylon, would benefit greatly from the microgrid project if implemented, as uninterrupted electrical power during and after a storm will help protect their businesses. The microgrid implementation aims to fulfill one of the Long Island Regional Economic Development Council’s key strategies (*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.*)



### ***Environmental Benefits***

While dependent upon final design, it is anticipated that the microgrid infrastructure will deliver clean, renewable energy utilizing green technologies on a daily basis.

### ***Health and Social Benefits***

Based on the initial risk reduction analysis, one of the key assets that could benefit from the implementation of the microgrid project is the Bayview Rest Home, an assisted living facility on Main Street. Bayview Rest Home is a 75-bed facility that, like many other facilities in the area, lost electrical power during Superstorm Sandy, and would benefit greatly from having uninterrupted power during and after future storms. Older adults residing in assisted-living facilities are at higher risk of having chronic conditions that require daily medications, specialized equipment, and ongoing coordinated care. The loss of electricity in an assisted-living facility, such as the Bayview Rest Home, could jeopardize life-saving medications that need to be refrigerated or certain specialized equipment does not have back-up power generation. Older adults are also at higher risk of trips or falls that could be debilitating or even life threatening, a risk that is exacerbated without proper lighting or illumination.

### **Cost Benefit Analysis**

This project would be justified, as it would help to fortify and improve the resiliency of downtown Babylon Village—specifically the concentration of key assets and businesses located in the area. At a cost of \$50,000 for the engineering feasibility study, the project will have numerous benefits including supporting and promoting the eventual provision of uninterrupted electrical power and decreased vulnerability to prolonged recovery. The benefits of this relatively inexpensive study are anticipated to outweigh the cost, making the project justifiable and appropriate.

### **Risk Reduction Analysis**

The key assets that could be part of the microgrid project include Village Hall, Fire Department Headquarters, Village DPW, Babylon Jr/Sr High School Complex, American Legion, St. Joseph Church complex, First Presbyterian Church and other key commercial/institutional businesses. Subject to the findings of the engineering study, other affected assets could include the Bayview Rest Home, an assisted living facility, on Main Street, which was included in the risk reduction analysis below.

Implementation of the microgrid project is projected to significantly reduce the vulnerability of the key assets listed above, since these assets would experience limited interruption in service with uninterrupted electrical power. The microgrid infrastructure will reduce the risk of adversely impacting emergency response services and maintain a critical mass of key assets operational during and immediately after natural disasters.



### General Timeframe for Implementation

It is estimated that, from the time implementation begins, this project could be implemented in the near-term (0 to 12 months). The engineering feasibility study will take approximately 6 months, depending on the overall project scope.

### Regulatory Requirements Related to Project

None. However, future project phases may require New York State Department of Environmental Conservation (DEC) permitting or affect DEC programmatic interests.

### Jurisdiction

Village of Babylon



## **PROPOSED PROJECT: Carlls River Tributary/Watershed Project (Phase 1)**

### **Project Description**

This project involves several interrelated infrastructure improvements that will manage water in the Carll’s River watershed. Phase 1 will include an initial engineering study and first round of infrastructure improvements. The engineering study will determine the overall scope of improvements for the Carlls River watershed, which will ultimately define the scope and technical feasibility of the specific components to be implemented.

Infrastructure elements to be considered in this study are the flood gates at Argyle Lake and Southard’s Pond, dams at Argyle and Elda Lakes, culvert infrastructure at Park Avenue, Locust

Avenue, LIRR trestle and Trolleyline Road as well as potential construction of stormwater wetlands at NYS Route 27 and Carlls River. All of the infrastructure elements are an integral part of one ecological/watershed area and need to be approached in a holistic manner.

Significant flooding occurred during Superstorm Sandy at the base of Argyle Lake adjacent to Main Street (Montauk Highway). The roadway was inundated in this immediate area. The elevation of Argyle Lake during Superstorm Sandy was within 2-3 inches of flooding the adjoining residential district and commercial district. Additionally, flooding has occurred along the entire north-south Carlls River tributary including Argyle Lake, Southards Pond, Elda Lake, etc. from both major (e.g. Hurricane Irene) storm events and minor storm events. Superstorm Sandy has been characterized as a relatively low rain/precipitation event. If Superstorm Sandy included rainfall amounts similar to Hurricane Irene, the impact to this area would have been tremendously increased.

### **Estimated Project Costs**

The total estimated cost of this proposed project is \$3,505,000. The cost of the initial engineering study is \$150,000. Planned infrastructure improvements are preliminarily estimated at \$3,335,000. (Note: More accurate cost estimates will be ultimately determined by the initial engineering study that will determine the overall scope of each project component.)

### **Carlls River Tributary/ Watershed Project (Phase 1)**

**Recovery Support Function:** Infrastructure

**Estimated Cost:** \$3,505,000

**Assets Made More Resilient:** Residences in all risk areas of Babylon Village and West Babylon hamlet, Argyle Lake Park, and streets in Extreme risk area

**Risk Reduction & Benefits:**

Reduced risk of wide spread flooding

Figure 5: Carlls River Tributary Watershed Project

**Project Benefits**

**Risk Reduction Benefits**

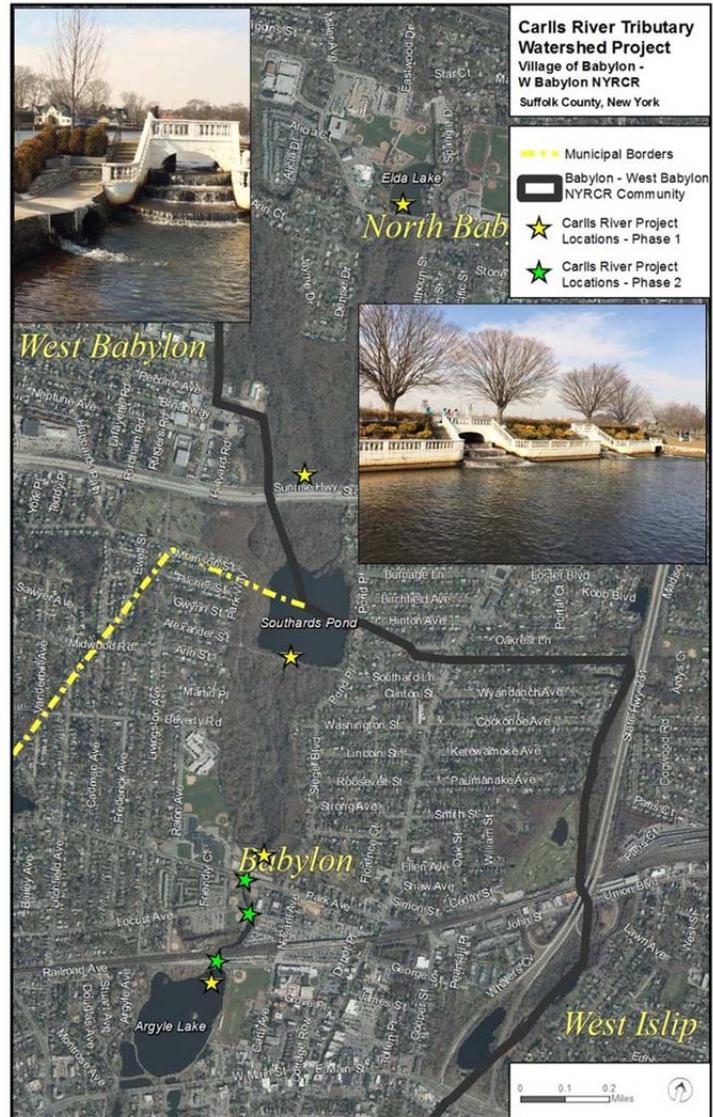
The Carlls River watershed is a key natural resource. Improved health and management of the watershed is vital for reducing local flood impacts—particularly during events such as Superstorm Sandy. The project could potentially reduce local flooding and improve local water quality, which benefits all residents within the community and greater watershed. This multi-component project will allow water levels to be adjusted and managed in preparation of major storm events. This will provide significant risk reduction to many assets in the tributaries watershed by reducing their exposure to flooding and flood damage. These assets include residential areas in the Extreme and High risk areas, key commercial assets, major and secondary road corridors in the Extreme risk area, LIRR infrastructure, and protection of parks/open space like Argyle Lake Park. All of the proposed infrastructure improvement elements are an integral part of an ecological/watershed area that will reduce risk and enhance the Carlls River tributary water quality and flow management.

**Economic Benefits**

Design and construction of the improvements to the various components of the Carlls River Tributary will create temporary jobs for a period of two years or more. The resiliency improvements planned for the watershed will reduce future storm-related emergency and recovery costs for the Town and Village of Babylon as well as adjacent homeowners and businesses along the tributary.

**Environmental Benefits**

The project could potentially improve local water quality through improved stormwater management and treatment, which benefits all residents within the community and the greater watershed, including the Great South Bay. The construction of stormwater wetlands at NYS Route 27 and Carlls River will be critically important to the ecological health of the Carlls River watershed. The stormwater wetlands help support and expand avian and aquatic wildlife in the area.





### Cost Benefit Analysis

The Carlls River watershed is a critical element of the Community's natural environment. The preservation and enhancement of the watershed would have numerous direct benefits (reduced flooding of adjacent neighborhood and community assets) and co-benefits (stabilizing property values/tax rates, preserving critical environmental areas and habitats, and recreational activities for the community) that support the conclusion that this project is a good investment.

### Risk Reduction Analysis

This multi-phase infrastructure project will provide significant risk reduction to residential areas, commercial assets, major and secondary road corridors, LIRR infrastructure and protection of park/open space assets. There are several assets anticipated to be positively affected by the implementation of this project. Enhanced flooding protection from 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 of secondary roads in the extreme risk areas as well as Argyle Lake Park. With a total area greater than 15 square miles, the Carlls River watershed is a sprawling and extensive natural system. As a result, the preservation and enhancement of the watershed reduces risk throughout much of the NYRCR Community.

### General Timeframe for Implementation

It is estimated that, from the time implementation begins, this project could be implemented in the long-term (12 to 36+ months). An engineering evaluation will first be required to determine the overall scope of improvements for the watershed (4-6 months). Engineering plans are then submitted to regulatory agencies for review and permit approval (2 months). Upon receiving regulatory and permit approvals, bid documents will be prepared and contractor(s) to conduct the work will be selected (2 months). The project will then be constructed per the contractor schedule submitted during the bidding process. Construction is anticipated to take 2-4 years, depending on the project design, time of year, weather, or other variable factors.

### Regulatory Requirements Related to Project

This project is anticipated to require permits and approvals from the New York State Department of Environmental Conservation (NYS DEC), the New York State Department of Transportation (NYS DOT), the Village of Babylon, and the Town of Babylon. Partnership and agreement with NYS DOT to construct wetlands on NYS DOT property will be required. A review of plans is also required by the New York State Office of Parks, Recreation & Historic Preservation (NYS OPRHP) if the project impacts State parkland and/or parkways. Otherwise, no additional constraints are anticipated.

### Jurisdiction

Town of Babylon and Village of Babylon



## PROPOSED PROJECT: *Town-Wide and Village-Wide Coastal Outfall Backflow Infrastructure*

### Project Description

This project involves the installation of in-line backflow valve infrastructure at 51 coastal outfalls into the Great South Bay and adjoining canals to reduce chronic street flooding within Extreme and Moderate residential areas associated with high tides and frequent storm events. Twenty-six (26) outfall locations will be implemented in the Village and twenty-five (25) locations within the West Babylon hamlet area.

Backflow infrastructure at coastal outfalls would have mitigated street flooding and property flooding during Superstorm Sandy until the storm surge elevation rose to levels above shoreline bulkheads and road elevations. Evacuation time and associated storm preparedness will be increased. Additionally, chronic and frequent street flooding caused from storm high tides would be mitigated. Specific locations within the Village and hamlet of West Babylon will be provided following project development.

### Estimated Project Costs

Total cost with 26 installed in the Village and 25 installed in the Town is approximately \$1,610,000; each outfall unit costs \$31,500.

(Note: Includes engineering, installation, and contingency costs.)

### Town-Wide and Village-Wide Coastal Outfall Backflow Infrastructure

**Recovery Support Function:** Infrastructure

**Estimated Cost:** \$1,610,000

**Assets Made More Resilient:** Residences and streets in the Extreme risk area of Babylon Village and West Babylon hamlet, waterfront commercial areas

**Risk Reduction & Benefits:**

Decreased vulnerability to flooding from improvements to coastal outfalls and valve infrastructure



*Typical coastal outfall*



### Project Benefits

#### ***Risk Reduction Benefits***

This project will reduce risk and chronic street flooding within residential areas located in the Extreme, High, and Moderate risk areas associated with high tides and frequent storm events by installing in-line backflow valve infrastructure at 51 coastal outfalls into the Great South Bay and canals.

While there are many assets within the Community that this project could potentially affect, the Planning Committee felt most confident that the project would reduce the risk for commercial properties along the waterfront, streets in the Extreme risk area, and residential housing in the Extreme risk area in Babylon Village and the West Babylon hamlet.

#### ***Economic Benefits***

The coastal outfalls are anticipated to reduce the risk of flooding for waterfront commercial properties and the streets that connect residents and visitors to those waterfront properties. With a reduced risk of flooding, waterfront commercial assets are more likely to be able to quickly recover and re-open for business after a storm event.

#### ***Health and Social Benefits***

This project is intended to reduce flood risk to residential housing located within the Extreme risk area in this planning area. Based on the number of homes located in the Extreme risk area, as well as population data from the 2010 U.S. Census, 2,400 residential structures, home to approximately 6,960 Babylon residents, would benefit from this project.

### Cost Benefit Analysis

The total project cost of \$1,610,000 is an investment that will yield high returns while reducing government and private expenditures as a result of future storms. Other benefits include decreased risk/vulnerability to flooding through the storm water system; economic benefit to maintaining residential property values; environmental benefits from reducing the back flow of storm sewer water into residential streets and private property. Health and social benefits from maintaining clear access to medical facilities during emergency events and for emergency responders would also be a benefit resulting from this project. This analysis demonstrates that the benefits of this project outweigh the costs making the project justifiable and appropriate.



### Risk Reduction Analysis

This project would reduce the risk for commercial properties along the waterfront, streets in the Extreme risk area, and residential housing in the Extreme risk area in Babylon Village and the West Babylon hamlet. Reduced flooding from the installation of coastal outfall tidal valves is anticipated to significantly reduce the vulnerability (measured as duration of potential service loss) of residential areas within Extreme risk areas. Thus, for residential assets, risk is anticipated to be reduced from Severe to High. In addition, streets and waterfront commercial properties are anticipated to experience reduced flooding as a result of the coastal tidal valves, reducing potential service losses for these assets. Since groups of assets, such as homes in the Extreme risk area, are grouped as a single asset, there are many hundreds of individual structures, facilities, or resources that would be affected by the Proposed Project. Risk reduction for the local street network is of particular importance, as flooding severely limited access for emergency response teams during Superstorm Sandy.

### General Timeframe for Implementation

It is estimated that, from the time implementation begins, this project could be implemented in the near-term (0 to 12 months). Engineering design specifications will take approximately 2 months to prepare. Engineering plans are then submitted to regulatory agencies for review and permit approval (2 months). Upon receiving regulatory and permit approvals, bid documents will be prepared and contractor(s) to conduct the work will be selected (2 months). The project will then be constructed per the contractor schedule submitted during the bidding process. Construction is anticipated to take 3-6 months, depending on the project design, time of year, weather, or other variable factors.

### Regulatory Requirements Related to Project

This project is anticipated to require permits and approvals from NYS DEC, the Village of Babylon, and the Town of Babylon.

### Jurisdiction

Town of Babylon and Village of Babylon



## **PROPOSED PROJECT: Araca Road (Dalton Point) Shoreline**

### **Stabilization**

#### **Project Description**

This project involves the acquisition of properties at Dalton Point, the construction of bulkheading, and the development of a living shoreline to reduce the frequency and risk of flooding impacts from storm events, related high tide flooding and shoreline erosion adjacent to single-family homes along Araca Road and the road integrity of Araca Road. This project will also preserve key open space parcels (Dalton Point), proposed to be acquired by the Village and located on both sides of the terminus of Araca Road, by stabilizing the shoreline with bulkhead treatments and addressing existing erosion problems. The project will also incorporate living shoreline treatments at the terminus of Araca Road along the Great South Bay.

#### **Araca Road (Dalton Point) Shoreline Stabilization**

**Recovery Support Function:**  
Infrastructure

**Estimated Cost:** \$925,000

**Assets Made More Resilient:** Residences and streets in the Extreme risk area of Babylon Village

**Risk Reduction & Benefits:**

Decreased vulnerability to flooding impacts from storm events, related high tide flooding, and shoreline erosion

The construction of bulkheading and development of a living shoreline will require close coordination with the NYS DEC and the U.S. Army Corps of Engineers (USACE). While the project will require coordination between several entities as well as permitting, the project still has high feasibility.

#### **Estimated Project Costs**

\$925,000 (Note: Includes engineering, installation, and contingency costs.)

#### **Project Benefits**

##### **Risk Reduction Benefits**

The shoreline stabilization project at Araca Road will reduce the frequency and risk of flooding impacts from storm events, related high tide flooding and shoreline erosion. The anticipated risk reduction resulting from this project would greatly benefit Village of Babylon Residential Housing in the Extreme risk area. Secondary streets in the Extreme risk area would also see significant risk reduction as a result of reduced flooding. However, since these residences and streets are located very close to the Great South Bay coast, they would continue to be vulnerable to flooding that comes over bulkheads, wind hazards, and power outages.

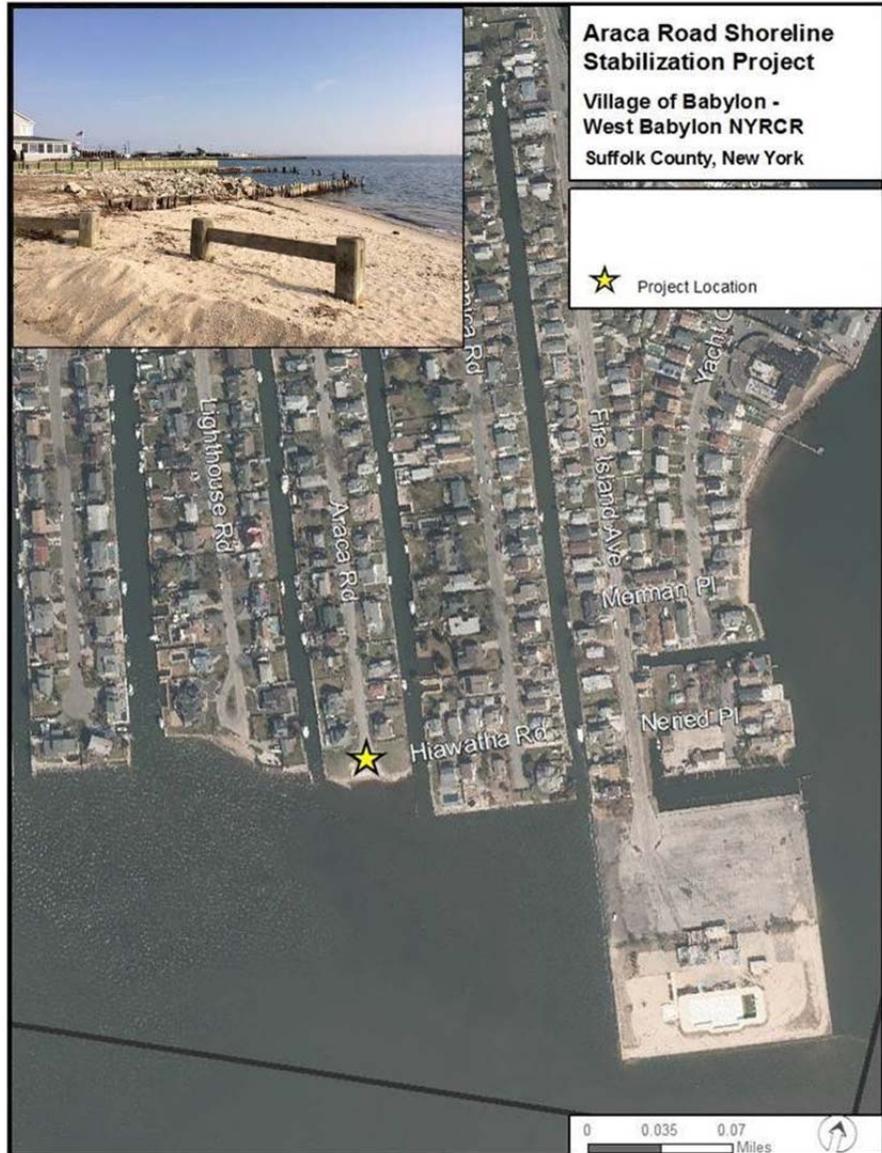
Figure 6: Araca Road Shore

**Environmental Benefits**

The construction of a living shoreline at Dalton Point could provide numerous environmental benefits, including the stabilization of the shoreline and the creation of valuable marine habitat to support various aquatic and terrestrial species. The living shoreline could also serve to improve water quality of the Great South Bay via filtration of up-land water run-off.

**Health and Social Benefits**

This project is intended to reduce flood risk to residential housing located within the Extreme risk area in the Village of Babylon. Based on the number of homes located in the Extreme risk area, as well as population data from the 2010 U.S. Census, 1,434 residential structures, home to approximately 3,944 Village residents, would benefit from this project.





### Cost Benefit Analysis

The stabilization of the shoreline and the incorporation of living shoreline treatments will provide public and private benefits for several assets and groups of assets located along the coast through the avoidance of damage caused by flooding during high tide and extreme storm events. With natural benefits including improved flood control, reduced erosion, and potential water quality and habitat improvements, the total project cost of \$925,000 is an investment that will yield high returns. These benefits are considered to outweigh the capital investment of the project, particularly with the Community's high concentration of housing in close proximity to the waterfront.

### Risk Reduction Analysis

This Proposed Project will primarily reduce risk for Village of Babylon housing in the Extreme risk area (approximately 1,434 structures) and secondary streets located in the Extreme risk area. This project will provide additional protection for vulnerable residences and streets against hurricane wave action and storm surge, as well as the longer-term effects of erosion and sea level rise.

### General Timeframe for Implementation

It is estimated that, from the time implementation begins, this project could be implemented in the mid-term (12 to 36 months). Engineering design specifications will take approximately 2-4 months to prepare. Engineering plans are then submitted to regulatory agencies for review and permit approval (2 months). Upon receiving regulatory and permit approvals, bid documents will be prepared and contractor(s) to conduct the work will be selected (2 months). The project will then be constructed per the contractor schedule submitted during the bidding process. Construction is anticipated to take 9-12 months, depending on the project design, time of year, weather, or other variable factors.

### Regulatory Requirements Related to Project

The project is anticipated to require permits and approvals from the NYS DEC, the USACE, and the Village of Babylon.

### Jurisdiction

Village of Babylon



## **PROPOSED PROJECT: *Little East Neck Road Shoreline Stabilization***

### **Project Description**

This project involves the construction of bulkheading and development of a living shoreline to reduce the frequency and risk of flooding impacts from storm events, related high tide flooding and shoreline erosion adjacent to the terminus of Little East Neck Road and the surrounding single-family homes. The terminus of Little East Neck Road has deteriorated bulkheading with the existing road edge failing. The combination of bulkhead treatments with living shoreline treatments will protect the road integrity, mitigate erosion, and provide property line stabilization along the street side of the Fred Shore Beach Club property adjacent to Little East Neck Road. However, no portion of the project scope will occur on private property (Fred Shore Beach Club). The scope of the project will occur within the right-of-way of Little East Neck Road.

The project will require close coordination with the NYS DEC and the USACE but is still a highly feasible project.

### **Estimated Project Costs**

\$457,400 (Note: Includes engineering, installation, and contingency costs.)

#### **Little East Neck Road Shoreline Stabilization**

**Recovery Support Function:** Infrastructure

**Estimated Cost:** \$457,000

**Assets Made More Resilient:** Residences and streets in the Extreme risk area of the hamlet of West Babylon

**Risk Reduction & Benefits:**

Decreased vulnerability to flooding impacts from storm events, related high tide flooding, and shoreline erosion

**Figure 7: Little East Neck Road Shoreline Stabilization**

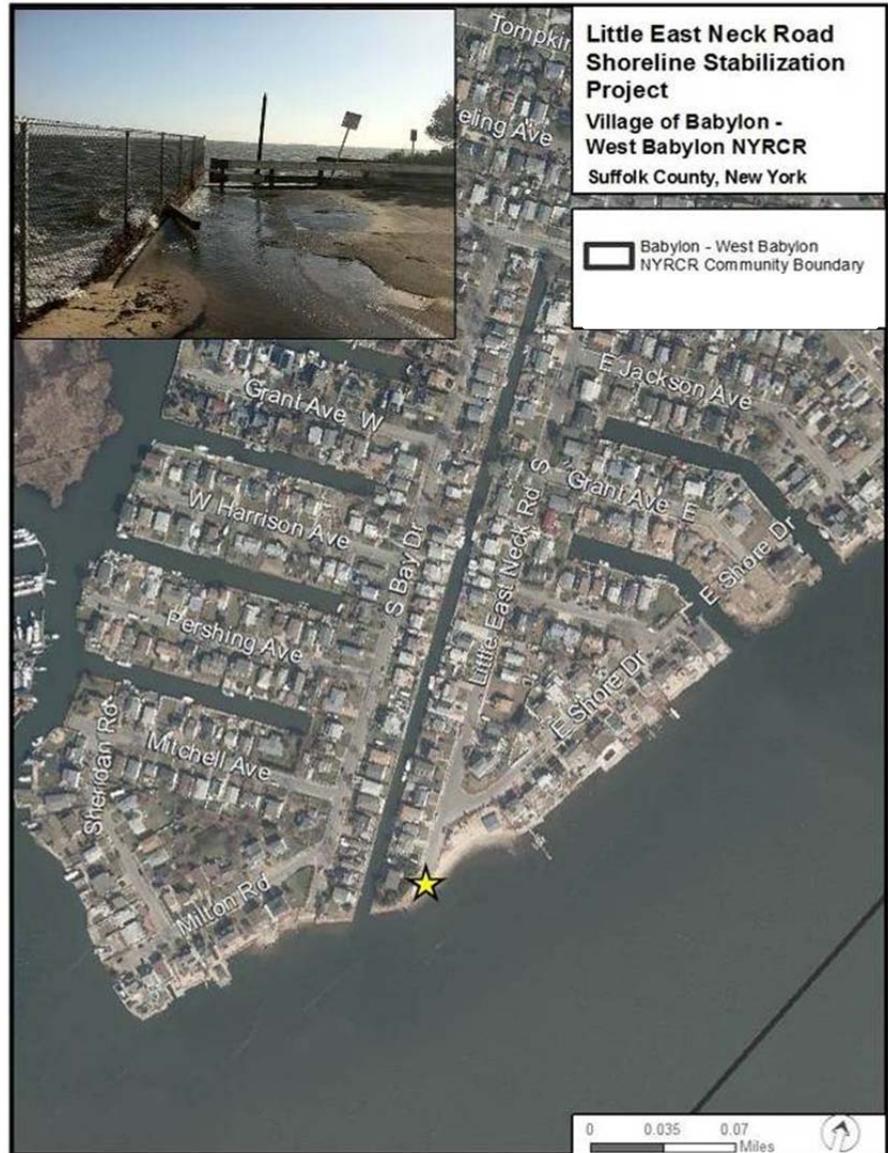
**Project Benefits**

**Risk Reduction Benefits**

The shoreline stabilization project at Little East Neck Road will reduce the frequency and risk of flooding impacts from storm events, related high tide flooding and shoreline erosion adjacent to single family homes. The anticipated risk reduction resulting from this project would greatly benefit West Babylon housing in the Extreme risk area as well as the Fred Shore Beach Club. Secondary streets in the Extreme risk area would also see significant risk reduction as a result of reduced flooding. However, since these residential areas and the Fred Shores Beach Club are located along the Great South Bay coast, they would continue to be vulnerable to flooding that comes over bulkheads, wind hazards, and power outages.

**Environmental Benefits**

The construction of a living shoreline at the Little East Neck Road terminus could provide numerous environmental benefits, including the stabilization of the shoreline and the creation of valuable marine habitat to support various aquatic and terrestrial species. The living shoreline could also serve to improve water quality of the Great South Bay via filtration of up-land water run-off.





### **Health and Social Benefits**

This project is intended to reduce flood risk to housing located within the Extreme risk area in the hamlet of West Babylon. Based on the number of homes located in the Extreme risk area as well as population data from the 2010 U.S. Census, 975 residential structures, home to approximately 2,974 West Babylon residents, would benefit from this project.

### **Cost Benefit Analysis**

The stabilization of the shoreline and the incorporation of living shoreline treatments will provide public and private benefits for several assets and groups of assets located along the coast through the avoidance of damage caused by flooding during high tide and extreme storm events. With natural benefits including improved flood control, reduced erosion, and potential water quality and habitat improvements, the total project cost of \$457,400 is an investment that will yield high returns. These benefits are considered to outweigh the capital investment of the project, particularly with the Community's high concentration of housing in close proximity to the waterfront.

### **Risk Reduction Analysis**

This Proposed Project will reduce risk for West Babylon housing in the Extreme risk area (approximately 975 structures), Fred Shore Beach Club, and secondary streets located in the Extreme risk area. This project will provide additional protection for vulnerable residences and streets against hurricane wave action and storm surge, as well as the longer-term effects of erosion and sea level rise.

### **General Timeframe for Implementation**

It is estimated that, from the time implementation begins, this project could be implemented in the mid-term (12 to 36 months). Engineering design specifications will take approximately 2-4 months to prepare. Engineering plans are then submitted to regulatory agencies for review and permit approval (2 months). Upon receiving regulatory and permit approvals, bid documents will be prepared and contractor(s) to conduct the work will be selected (2 months). The project will then be constructed per the contractor schedule submitted during the bidding process. Construction is anticipated to take 9-12 months, depending on the project design, time of year, weather, or other variable factors.

### **Regulatory Requirements Related to Project**

It is anticipated to require permits and approvals from the NYS DEC, the USACE, and the Town of Babylon.

### **Jurisdiction**

Town of Babylon



## **PROPOSED PROJECT: Venetian Shores Park Shoreline Engineering Study and Pilot Constructed Dune Project**

### **Project Description**

This pilot project involves the elevation of the southeast shoreline area of Venetian Shores Park with constructed and stabilized dunes. Soft shoreline stabilization methods and technologies that are well understood and have been used for other dune restoration projects in Long Island will be employed.

Venetian Shores Park is a public park open to the entire general population for the Town of Babylon—2010 population of 210,000 (not just West Babylon/Venetian Shores). The first component of this project is the preparation of an engineering study to develop innovative long-term shoreline stabilization improvements to protect a key recreational asset and adjacent homes. The pilot project scope would include the construction of an engineered planted dune on the shore-side of Venetian Boulevard and Granada Parkway (SE corner of park along Great South Bay) and on the southwesterly side of park beach adjacent to parking lot. This engineering study and pilot project would demonstrate the effectiveness of utilizing constructed dunes and living shoreline treatments as shoreline protection immediately adjacent to residential streets, homes and open space/park assets.

As a Town of Babylon property, the Venetian Shores project would require close collaboration and partnership with the Town. Otherwise, there are no property issues or other constraints anticipated for this project and it is considered a highly feasible project.

### **Estimated Project Costs**

\$179,500 (Note: Includes engineering, installation, and contingency costs.)

#### **Venetian Shores Park Shoreline Engineering Study and Pilot Constructed Dune Project**

**Recovery Support Function:** Infrastructure

**Estimated Cost:** \$180,000

**Assets Made More Resilient:** Residences and streets in the Extreme risk area of the hamlet of West Babylon; Venetian Shores Park, including microwave tower

#### **Risk Reduction & Benefits:**

Decreased vulnerability of flooding through the construction of a shoreline stabilized dune

**Project Benefits**

**Risk Reduction Benefits**

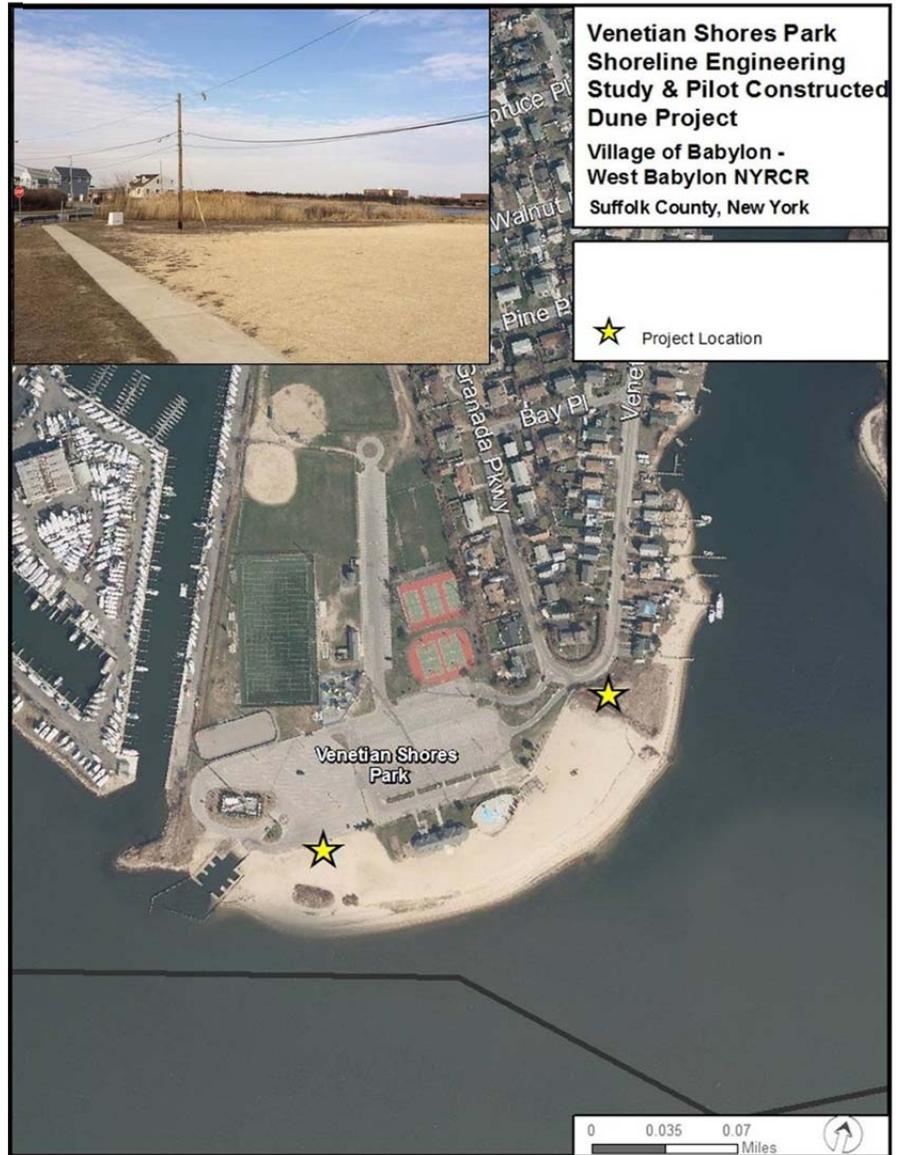
This pilot project will include the construction of a shoreline dune stabilized with indigenous plantings as a protective shoreline improvement. This project is anticipated to reduce the risk for Venetian Shores Park and a microwave tower located in the park by having stabilized dunes that reduce these assets' exposure to flooding. This project is also expected to reduce the vulnerability of housing and secondary roads located in the Extreme risk area within the hamlet of West Babylon.

**Health and Social Benefits**

Coastal dunes are an important and natural barrier to wind and wave forces, particularly in an event similar to Superstorm Sandy. The construction and stabilization of the dunes at Venetian Shores Park is anticipated to reduce flood risk to

housing located within the Extreme risk area of West Babylon. Based on the number of homes located in the Extreme risk area as well as population data from the 2010 U.S. Census, 975 residential structures, home to approximately 2,974 West Babylon residents, would benefit from this project. Additionally, Venetian Shores Park represents an important recreational asset for the entire Town of Babylon community. Restoration of the beach and dunes at Venetian Shores Park would ensure the continuation of a healthy and natural recreation opportunity for Town residents.

**Figure 8: Venetian Shores Park Shoreline Engineering Study**





### Cost Benefit Analysis

The stabilization of the shoreline and the incorporation of natural dune features will provide public and private benefits for several assets and groups of assets located along the coast through the avoidance of damage caused by flooding during high tide and extreme storm events. As the project will result in improved flood control and reduced erosion, the total project cost of \$179,500 is an investment that will yield high returns. These benefits are considered to outweigh the capital investment of the project, particularly with the Community's high concentration of residential and recreational assets in close proximity to the waterfront.

### Risk Reduction Analysis

This Proposed Project will reduce risk for West Babylon Residential Housing in the Extreme risk area (approximately 975 structures), Venetian Shores Park, and secondary streets located in the Extreme risk area. This project will provide additional protection for vulnerable assets against hurricane wave action and storm surge, as well as the longer-term effects of erosion and sea level rise.

### General Timeframe for Implementation

It is estimated that, from the time implementation begins, this project could be implemented in the mid-term (12 to 36 months). Engineering design specifications will take approximately 2-4 months to prepare. Engineering plans are then submitted to regulatory agencies for review and permit approval (2 months). Upon receiving regulatory and permit approvals, bid documents will be prepared and contractor(s) to conduct the work will be selected (2 months). The project will then be constructed per the contractor schedule submitted during the bidding process. Construction is anticipated to take 9-12 months, depending on the project design, time of year, weather, or other variable factors.

### Regulatory Requirements Related to Project

This project is anticipated to require permits and approvals from the NYS DEC, the U.S. ACE and the Town of Babylon.

### Jurisdiction

Town of Babylon



## **PROPOSED PROJECT: West Babylon Hamlet Open Space Acquisition/Stormwater Engineering Study and Pilot Green Infrastructure Project**

### **Project Description**

The initial phase of this project involves the preparation of an engineering study to develop the scope of an innovative open space/stormwater infrastructure project with an initial pilot scope of rain gardens/bioswales and combined stormwater/street tree structures in the vicinity of Bergen Avenue and Montauk Highway. This engineering study and pilot scope would be the initial step in a long term, multi-benefit project of improving stormwater management and creating a hamlet identity for West Babylon. The project scope includes the acquisition of a key open-space parcel for a constructed wetland/open-space park that will provide improved infrastructure, cultural and educational benefits and serve as an economic stimulus along the Montauk Highway corridor.

The initial pilot scope has revealed a limited right-of-way shoulder area for construction implementation, which may impact feasibility of implementation. Also, this project ultimately would involve the acquisition of the private property for the open-space stormwater retention area and hamlet center. Nonetheless, the project is feasible.

### **West Babylon Hamlet Open Space Acquisition/Stormwater Engineering Study and Pilot Green Infrastructure Project**

**Recovery Support Function:** Economic Development

**Estimated Cost:** \$250,000

**Assets Made More Resilient:** Streets in the Extreme risk area in the West Babylon hamlet

**Risk Reduction & Benefits:**  
Decreased vulnerability to flooding through stormwater quality improvements and stormwater runoff reduction

### **Estimated Project Costs**

\$250,000 (Note: Includes engineering, installation, and contingency costs.)

### **Project Benefits**

#### **Risk Reduction Benefits**

This pilot project will result in stormwater quality improvements and stormwater runoff reduction with demonstration combined street tree/stormwater storage structures and rain garden treatments adjacent to sidewalk areas along Montauk Highway and Bergen Avenue.



This project is anticipated to reduce flood risk for streets in the Extreme risk area of the West Babylon hamlet, particularly along Montauk Highway and Bergen Avenue. The stormwater runoff reduction resulting from this project is expected to significantly reduce the vulnerability of secondary streets in the Extreme risk area.

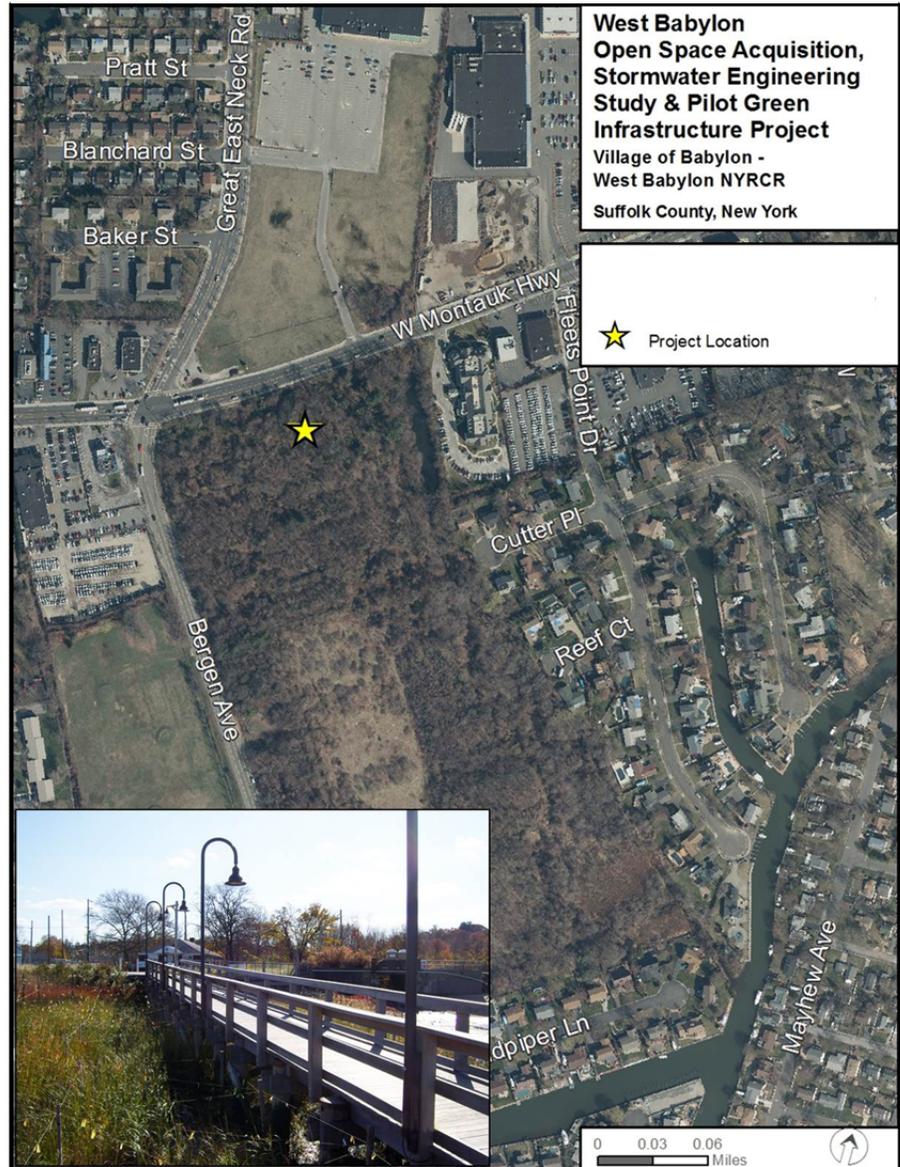
**Economic Benefits**

Designating and supporting the creation of a hamlet center for West Babylon could be a catalyst for economic development in the community, which currently has no area that is considered “downtown” or the center of town. Green infrastructure and public open spaces will help to facilitate future growth and development and encourage community activities and interaction.

**Environmental Benefits**

The integration of a stormwater retention area and rain gardens within the proposed West Babylon hamlet center aims to alleviate some of the negative environmental impacts of stormwater runoff by retaining a larger percentage of stormwater and reducing flood risk in the area. The project could potentially improve local water quality, which benefits all residents within the community and the greater watershed, including the Great South Bay.

Figure 9: West Babylon Open Space Acquisition



West Babylon  
Open Space Acquisition,  
Stormwater Engineering  
Study & Pilot Green  
Infrastructure Project  
Village of Babylon -  
West Babylon NYRCR  
Suffolk County, New York

★ Project Location



### Cost Benefit Analysis

West Babylon residents have expressed a desire to establish a new identity, particularly after the damaging effects of Superstorm Sandy to both local and neighboring commercial areas. West Babylon's commercial district along Montauk Highway is an ideal location to invest in a key open space area. A \$250,000 initial investment in West Babylon will lay the groundwork for an enhanced hamlet identity, increased economic activity, and improved stormwater management. The potential benefits of this project are considered to outweigh the costs.

### Risk Reduction Analysis

The proposed project would help to reduce flooding along the Montauk Highway corridor, thereby reducing risks to nearby residential housing in the Extreme and High risk areas, businesses, and the local street network itself. The potential for increased economic activity is also an important component, as the project will help to reduce risk for any new investment in the area.

### General Timeframe for Implementation

It is estimated that, from the time implementation begins, this project could be implemented in the near-term (0 to 12 months). The engineering study will take approximately 2 months to complete. The pilot scope is anticipated to take approximately 6 months, in parallel with engineering plans to be submitted to regulatory agencies for review and permit approval. Upon receiving regulatory and permit approvals, bid documents will be prepared and contractor(s) to conduct the work will be selected (2 months). The project will then be constructed per the contractor schedule submitted during the bidding process. Construction is anticipated to take 2 months, depending on the project design, time of year, weather, or other variable factors.

### Regulatory Requirements Related to Project

This project is anticipated to require permits or approvals from NYS DOT, the Suffolk County Department of Public Works, and the Town of Babylon.

### Jurisdiction

Town of Babylon



## **PROPOSED PROJECT: Complete Streets Engineering Study and Pilot Green Infrastructure Project**

### **Project Description**

The first phase of this project involves the preparation of an engineering study to develop a comprehensive scope for a “complete streets” project strengthening the connection between Main Street and the Village waterfront. The pilot scope would include the construction of Permeable Pavement Treatments at key intersection(s) and adjacent rain garden treatments along route between Main Street and the Village waterfront. This engineering study and pilot scope would be the initial step in a long term multi-benefit project strengthening the connectivity between Main Street and Village waterfront with a menu of innovative/green stormwater infrastructure elements, permeable pavement treatments, bicycle and trolley service, LED lighting, shoreline stabilization treatments, and streetscape enhancements. This project would provide enhanced stormwater management reducing frequent street flooding and provide the additional benefit as an economic stimulus into the Village waterfront.

The Village of Babylon owns all affected roads within project scope and the proposed pilot project components have been implemented in multiple locations across the United States. The preliminary determination is that this would be a highly feasible project.

### **Estimated Project Costs**

\$250,000 (Note: Includes engineering, installation, and contingency costs.)

### **Complete Streets Engineering Study and Pilot Green Infrastructure Project**

**Recovery Support Function:** Infrastructure

**Estimated Cost:** \$250,000

**Assets Made More Resilient:** Residences in all risk areas within the Village of Babylon, waterfront, and downtown commercial areas, and streets in the Extreme risk area

#### **Risk Reduction & Benefits:**

Decreased vulnerability to flooding through the implementation of permeable pavement and rain garden treatments

Increased economic resiliency with enhanced tourism activity



**Green Pedestrian Infrastructure**

(Photo Credit: Pedestrian Bicycle Information Center)



## Project Benefits

### ***Risk Reduction Benefits***

This pilot project will incorporate the use of decorative permeable pavement treatments along Willow Street and Fire Island Avenue and incorporate adjacent rain garden treatments as the first phase of a “complete streets” project. These actions will achieve stormwater runoff reduction. Ultimately, the long-term goal of a “complete streets” program would be to provide strengthened connectivity between the Village Main Street and the waterfront area with a comprehensive program of innovative green infrastructure, dedicated bicycle lanes, trolley service and associated streetscape enhancements. Such a program would have multiple benefits, including improved stormwater management, flood protection, improved connectivity to the waterfront area, and enhanced tourism activity.

Implementation of a “complete streets” pilot project in Babylon Village would reduce the vulnerability of several key assets including residential housing in all risk areas, secondary streets, and commercial districts. The permeable pavement and rain garden treatments are anticipated to reduce stormwater runoff, which should reduce the risk of flooding during extreme storm events. Improved stormwater management is anticipated to reduce the vulnerability from flooding for streets in the Extreme risk area. Lastly, this project is expected to increase the economic resiliency of the Village Main Street commercial district and the Village waterfront commercial enterprises and allow for increased multi-modal connectivity, which would allow residents to travel to commercial centers even with gas shortages, which happened after Superstorm Sandy.

### ***Economic Benefits***

Complete street projects have been shown to stimulate economic growth by providing accessible and efficient connections between residential, commercial, and recreational areas. Within the Village of Babylon, a complete streets program would help connect the downtown commercial area to waterfront commercial assets. This project also aims to fulfill one of the Long Island Regional Economic Development Council’s key strategies (Develop innovation and industry clusters in transformative 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.)



***Bicycles in Babylon Village***

### ***Environmental Benefits***

The integration of permeable pavement and rain gardens within the complete streets design aims to alleviate some of the negative environmental impacts of stormwater runoff by retaining a larger percentage of stormwater than a normal street design. Additionally, complete streets encourage the use of non-motorized transportation options, such as bicycling and walking—reducing motor vehicle traffic and improving local air quality.



### **Health and Social Benefits**

There are multiple health co-benefits with the implementation of complete street design principles. Redesigning streets to make it safe for walking and bicycling has been shown to improve safety for all road users by reducing crashes. Supporting regular physical activity, such as walking and biking, can have several positive physical and mental benefits, including weight control, reducing the risk of cardiovascular disease, type 2 diabetes, increased incidence of other illnesses, improved mood, and life expectancy. In addition, improvements in local air quality resulting from a reduction in motor-vehicle traffic can help reduce the incidence of asthma attacks.

### **Cost Benefit Analysis**

The proposed project has been analyzed in terms of its costs and benefits. While this project only represents Phase 1 of a larger “complete streets” project, once fully implemented, a complete streets project will provide numerous benefits, including improved public health and safety, increased multi-modal mobility, and reduced flooding from stormwater. Together, these improvements provide both public and private benefits stretching across several of the identified Recovery Support Functions, including health and social services, economic development and infrastructure. This analysis demonstrates that the benefits outweigh the costs, making the project justifiable and appropriate.

### **Risk Reduction Analysis**

Once fully implemented, this project will reduce risks to Village of Babylon housing in all risk areas, secondary streets, and commercial districts by improving stormwater management and reducing local flooding. In addition to reduction of risks to key assets, the implementation of this project is anticipated to improve multi-modal circulation and reduce the local street network’s risk to flooding because of the proposed improvements. With safety as a primary goal of any complete streets project, this proposed project reduces risk for all residents and visitors in the Community. However, such streetscape improvements are particularly beneficial to vulnerable populations, such as the elderly and disabled.

### **General Timeframe for Implementation**

It is estimated that, from the time implementation begins, this Project has potential for immediate implementation (0 to 12 months). The engineering study is anticipated to take 2 months. Engineering plans are then submitted to regulatory agencies for review and permit approval (3 months). Upon receiving regulatory and permit approvals, bid documents will be prepared and contractor(s) to conduct the work will be selected (2 months). The project will then be constructed per the contractor schedule submitted during the bidding process. Construction is anticipated to take approximately 3-4 months, depending on the project design, time of year, weather, or other variable factors.

### **Regulatory Requirements Related to Project**

Appropriate permits and approvals would be necessary from the NYS DOT and the Village of Babylon.

### **Jurisdiction**

Village of Babylon



## **PROPOSED PROJECT: Cedar Street Property Acquisition and Construction of Emergency Equipment Garage – Babylon Fire Department**

### **Project Description**

This project involves the acquisition of property and the construction of a new garage facility to address the lack of storage for specialized emergency equipment and to facilitate emergency response and mobilization of equipment.

In order to implement this project, the property adjacent to the Cedar Street Firehouse would have to be acquired and necessary permits and approval from the Village of Babylon for acquisition and construction of the garage would need to be obtained. This project is determined to be highly feasible.

### **Estimated Project Costs**

The total estimated cost of the project is \$700,000. Acquisition of the property adjacent to the Cedar Street Firehouse is estimated at \$400,000. (Note: Includes engineering, installation, and contingency costs.)

### **Project Benefits**

#### **Risk Reduction Benefits**

This project will provide the necessary storage of specialized equipment and will help facilitate emergency response and mobilization of equipment.

### **Cost Benefit Analysis**

The Village of Babylon recognizes the inefficiencies and shortcomings of their currently

### **Cedar Street Property Acquisition and Construction of Emergency Equipment Garage – Babylon Fire Department**

**Recovery Support Function:** Infrastructure

**Estimated Cost:** \$700,000

**Assets Made More Resilient:** Babylon Fire Department facilities and mobile equipment

#### **Risk Reduction & Benefits:**

Increased capacity to provide emergency services during and after events



**Cedar Street Firehouse**



available emergency facilities, as demonstrated in the aftermath of Superstorm Sandy. The proposed facility upgrades have been analyzed in terms of their costs and benefits. At a cost of \$700,000, the project will have numerous benefits including reducing emergency response time and ensuring comprehensive provision of emergency services to residents.. During emergency events, quick access to equipment and resources is absolutely critical ensure that first responders are well-prepared. The potential benefits of enhanced emergency service facilities are believed to outweigh the costs of this project.

### **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. Yet the project increases resiliency throughout the Community as residents, business owners, and the first responders in the area will benefit from increased preparedness and decreased response times. Enhancing the capacity of the Fire Department to respond to affected areas during an emergency event will also help to mitigate property loss or damage for many assets throughout the Village.

### **General Timeframe for Implementation**

It is estimated that, from the time implementation begins, this project could be implemented in the near-term (0 to 12 months). The property acquisition phase is anticipated to take up to 3-4 months. Following property acquisition, engineering plans for the new garage will be submitted to regulatory agencies for review and permit approval (2 months). Upon receiving regulatory and permit approvals, bid documents will be prepared and contractor(s) to conduct the work will be selected (2 months). The project will then be constructed per the contractor schedule submitted during the bidding process. Construction is anticipated to take approximately 1-2 months, depending on the design, time of year, weather, or other variable factors.

### **Regulatory Requirements Related to Project**

Necessary permits and approvals from the Village of Babylon would be required for the acquisition and construction of the garage.

### **Jurisdiction**

Village of Babylon



## PROPOSED PROJECT: West Babylon Fire Department EMS Facility

### Project Description

This project involves the construction of a freestanding EMS Building directly adjacent to the Firehouse. The new EMS Building will properly house dedicated EMS vehicles, which represent approximately 90% of emergency calls in the District. The building will also provide dormitory quarters for EMS personnel, thus facilitating improved response time.

The project would require the construction of a two-story building with a total square footage of approximately 3,000 square feet. The ground floor of the building would be used for the storage of four emergency response vehicles and the second floor would provide dormitory quarters, office space, bathrooms, and common space for emergency personnel. The proposed location for the EMS facility is located on a property owned by the West Babylon Fire Department and therefore no real property issues or other constraints are anticipated for this project. This is considered to be a highly feasible project.

### Estimated Project Costs

\$1,000,000 (Note: Includes engineering, installation, and contingency costs.)

### Project Benefits

#### Risk Reduction Benefits

This project will provide a separate freestanding building for storage of EMS vehicles and dormitory quarters for personnel facilitating and improving emergency response time and services. The Fire District has a large number of senior housing developments, assisted living, and nursing homes. The vulnerable residents of these developments and facilities would benefit from risk reductions associated with this project.

### West Babylon Fire Department EMS Facility

**Recovery Support Function:** Infrastructure

**Estimated Cost:** \$1,000,000

**Assets Made More Resilient:** West Babylon Fire Department facilities and mobile equipment

#### Risk Reduction & Benefits:

Increased capacity to provide emergency services during and after events, particularly for senior population living in West Babylon



**West Babylon Fire Department Rescue Vehicle**  
(Photo Credit: Ellen McArdle, West Babylon Fire District)



### **Health and Social Benefits**

The project would enhance the capacity of the West Babylon Fire Department, which serves all of the residents of the West Babylon hamlet. It is vital to the health and safety of all residents in the hamlet that the Fire Department has the capacity to respond and serve all areas affected during and following a disaster. During Superstorm Sandy, the Fire Department was incapable of reaching certain areas of West Babylon due to high floodwaters. In particular, approximately 14% of the population in West Babylon is aged 65 or over, equaling almost 6,200 vulnerable residents that would benefit from improved emergency response capacity and service.

### **Cost Benefit Analysis**

At a cost of \$1,000,000, the project will have numerous benefits including reducing emergency response time and ensuring comprehensive provision of emergency services to residents. During emergency events, quick access to equipment and resources is absolutely critical ensure that first responders are well-prepared in all situations. The potential benefits of enhanced emergency service facilities are believed to outweigh the cost of this project. In these situations, every additional minute of response/travel time can mean the difference between life and death.

### **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. Yet the project still increases resiliency throughout the Community as residents, business owners, and the first responders in the area will benefit from increased preparedness and decreased response times. As a result, the proposed project is anticipated to reduce risks to all residents and properties throughout West Babylon. Such a facility would greatly reduce response and transportation times for those requiring EMS services. The West Babylon Fire Department would be better prepared and equipped to serve those in need with a dedicated EMS facility centrally located within West Babylon.

### **General Timeframe for Implementation**

It is estimated that, from the time implementation begins, this project could be implemented in the mid-term (12 to 36 months). Engineering plans will need to be prepared (6-8 months) and submitted to regulatory agencies for review and permit approval (approximately 4 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 then be constructed per the contractor schedule submitted during the bidding process. Construction is anticipated to take approximately 6-8 months, depending on the project design, time of year, weather, or other variable factors.

### **Regulatory Requirements Related to Project**

Anticipated permits and approvals required for this project would be needed from the West Babylon Fire District and the New York State Division of Building Standards and Codes.

### **Jurisdiction**

Town of Babylon



## **PROPOSED PROJECT: *Babylon Central Alarm – Upgrade to Communications Infrastructure***

### **Project Description**

This project involves critical upgrades to the existing communications infrastructure serving ten (10) Fire Departments within the Town of Babylon. The Central Alarm provides vital and essential emergency communications for coordinated response.

There are no anticipated challenges for this project since the central alarm system is an existing communication system that needs upgrades; thus, this is a highly feasible project.

### **Estimated Project Costs**

\$257,000

### **Project Benefits**

#### ***Risk Reduction Benefits***

Communication was a major challenge during Superstorm Sandy, particularly for fire personnel working in extremely challenging conditions. By making critical upgrades to the central alarm 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 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.

#### ***Health and Social Benefits***

Improved emergency response time during an emergency or disaster can reduce the risk the risk of injury or death for both first responders and the people they are working to protect and assist.

### **Babylon Central Alarm – Upgrade to Communications Infrastructure**

***Recovery Support Function:*** Infrastructure

***Estimated Cost:*** \$257,000

***Assets Made More Resilient:*** Town of Babylon member Fire Department facilities

***Risk Reduction & Benefits:***

Increased capacity to provide emergency services during and after events



## Cost Benefit Analysis

The proposed central alarm upgrade has been analyzed in terms of its costs and benefits. At a cost of \$257,000, the project will have numerous benefits including improving the speed and quality of emergency response. During emergency events, quick responses are absolutely critical ensure the health and safety of residents. The potential benefits of an enhanced alarm system are believed to outweigh the costs of this project.

## 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 alarm upgrade. The project would increase resiliency throughout the Community, however, as residents, business owners, and the first responders in the area would benefit from better coordination among departments and decreased emergency response times. As a result, the proposed project is anticipated to reduce risks to all residents and properties throughout the Town of Babylon. All emergency responders and Town departments 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 project could be implemented in the near-term (0 to 12 months). Engineering plans will need to be prepared (4-5 months) and then submitted to the Fire Departments and the Town review and approval (2 months). Upon receiving necessary approvals, bid documents will be prepared and contractor(s) to conduct the work will be selected (2 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

None

## Jurisdiction

Town of Babylon



**Town of Babylon Central Alarm**  
*(Photo Credit: Scott Glenn, Babylon Fire Department)*



## FEATURED PROJECT: *Microgrid Implementation – Babylon Village*

### Project Description

This project involves the implementation of microgrid infrastructure in downtown Babylon Village. Energy infrastructure details, transmission, limits of distribution, ownership, operations, etc. will be determined by the Engineering Study performed as a Proposed Project, discussed earlier.



**Sample Fuel Cell Microgrid**  
(Photo Credit: FuelCell Energy Inc.)

The initial feasibility study will determine the overall scope of the microgrid system, which will ultimately determine the technical feasibility of the project. However, due to the innovative nature of this project, there are technical feasibility issues that are anticipated, including but not limited to determining the type of energy source and technology that could be used to power the microgrid. Acquisition of real property may be necessary to construct and install the microgrid and transmission infrastructure.

Additional constraints would be determined by the feasibility study.

### **Microgrid Implementation – Babylon Village**

**Recovery Support Function:**  
Infrastructure

**Estimated Cost:** \$10,000,000

**Assets Made More Resilient:**  
Babylon Village Hall, Fire Department Headquarters, Babylon Village DPW, Babylon Jr/Sr High School Complex, American Legion, St. Joseph Church complex, First Presbyterian Church and other key commercial /institutional businesses in the Village of Babylon

**Risk Reduction & Benefits:**  
Enhanced resiliency of key assets by providing independent, uninterrupted electrical power

Economic resilience for commercial assets in Village downtown

Environmental benefits through the delivery of clean energy

Increased resilience of vulnerable populations, particularly assisted living facilities



### Estimated Project Costs

\$10,000,000 (Note: The anticipated operation and maintenance costs for this project were not defined within this cost estimate since the initial feasibility study has not yet been performed. However, substantial operations and maintenance costs are expected once the microgrid infrastructure is installed.)

### Project Benefits

#### ***Risk Reduction Benefits***

It is anticipated that the implementation of the microgrid project will enhance resiliency of key assets within the Village downtown center by providing independent, uninterrupted electrical power when the main electrical grid goes off-line and therefore reduce the vulnerability of emergency response services and maintain operation of a critical mass of key assets necessary during natural disasters as well as during disaster recovery.

#### ***Economic Benefits***

Local business owners in downtown Babylon would benefit greatly from the proposed project because of the potential for uninterrupted electrical power during and after a storm. Eventual implementation of the microgrid project would be an innovative infrastructural investment that would improve the long-term sustainability and ensure a dynamic and resilient downtown area in the Village of Babylon. The microgrid implementation would fulfill one of the Long Island Regional Economic Development Council's key strategies: *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.*

#### ***Environmental Benefits***

The microgrid infrastructure could also offer environmental benefits through the generation and delivery of cleaner, more efficient energy—including solar energy—on a daily basis, which would reduce greenhouse gas emissions.

#### ***Health and Social Benefits***

Based on the initial risk reduction analysis, one of the key assets that could benefit from the implementation of the microgrid project is the Bayview Rest Home, an assisted living facility on Main Street. Bayview Rest Home is a 75 bed facility that, like many other facilities in the area, lost electrical power during Superstorm Sandy, and would benefit greatly from having uninterrupted power during and after future storms. Older adults residing in assisted-living facilities are at higher risk of having chronic conditions that require daily medications, specialized equipment, and ongoing coordinated care. The loss of electricity in an assisted-living facility, such as the Bayview Rest Home, can jeopardize life-saving medications that need to be refrigerated or certain specialized equipment that is not supported with back-up power. Older adults are also at higher risk of trips or falls that could be debilitating or even life threatening, a risk that is exacerbated by the absence of proper illumination during a blackout.



### Cost Benefit Analysis

This project would help to fortify and improve the resiliency of downtown Babylon Village, including a concentration of key assets and businesses. At a cost of \$10,000,000 for the full implementation of the microgrid, the project will have numerous benefits including the eventual provision of uninterrupted electrical power. Once implemented, the benefits of this project are anticipated to outweigh its cost.

### Risk Reduction Analysis

The key assets anticipated to be part of the microgrid project include Village Hall, Fire Department Headquarters, Village DPW, Babylon Jr/Sr High School Complex, American Legion, St. Joseph Church complex, First Presbyterian Church and other key commercial/institutional businesses. Subject to the findings of the engineering study, other affected assets could include the Bayview Rest Home, an assisted living facility, located on Main Street.

Implementation of the microgrid project is projected to reduce the vulnerability of the key assets listed above, since these assets would experience limited interruption in service with uninterrupted electrical power. The microgrid infrastructure will reduce the risk of adversely impacting emergency response services and maintain a critical mass of key assets operational during and immediately after natural disasters.

### General Timeframe for Implementation

It is estimated that, from the time implementation begins, this project could be implemented in the long-term (3-5 years). Based on the engineering study prepared during an earlier phase, property acquisition may be required, which could take approximately 6-12 months. Engineering plans will then be prepared (6-8 months) and submitted to regulatory agencies for review and permit approval (6-8 months). Upon receiving regulatory and permit approvals, bid documents will be prepared and contractor(s) to conduct the work will be selected (2 months). The project will then be constructed per the contractor schedule submitted during the bidding process. Construction is anticipated to take at least 18 months, depending on the project scope and design, time of year, weather, or other variable factors.

### Regulatory Requirements Related to Project

This project is anticipated to require appropriate permits and approvals from the Village of Babylon and the New York Public Service Commission. It is also expected that the Village of Babylon will have to coordinate and collaborate closely with LIPA/PSEG Long Island.

### Jurisdiction

Village of Babylon



## FEATURED PROJECT: *Carlls River Tributary/Watershed Project (Phase 2)*

### Project Description

This project involves the next phase of key stormwater infrastructure upgrades at the Carlls River watershed, including the replacement of key culvert crossings and the expansion/widening of the LIRR culvert opening. Phase 1 of these improvements, a proposed project, is discussed above. The series of major culvert crossing replacements would include Park Avenue, Locust Avenue, LIRR trestle, and Trolleyline Road. This comprehensive program of water quality and management improvements would also include the construction of stormwater wetlands at Carlls River NYS Parkland (filled wetlands) just south of Elda Lake.

### Estimated Project Costs

\$3,000,000

### Project Benefits

#### **Risk Reduction Benefits**

The Carlls River 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 project could potentially reduce local flooding and improve local water quality, which benefits all residents within the community and greater watershed. This multi-component project will allow water levels to be adjusted and managed in preparation of major storm events. This will provide significant risk reduction to many assets in the tributaries watershed by reducing their exposure to flooding and flood damage. These assets include residential areas in the Extreme and High risk areas, key commercial assets, major and secondary road corridors in the Extreme risk area, LIRR infrastructure, and protection of parks/open space like Argyle Lake Park.

### **Carlls River Tributary/Watershed Project (Phase 2)**

**Recovery Support Function:** Infrastructure

**Estimated Cost:** \$3,000,000

**Assets Made More Resilient:** Residences in all risk areas of Babylon Village and West Babylon hamlet, Argyle Lake Park, and streets in Extreme risk area

#### **Risk Reduction & Benefits:**

Reduced risk of wide spread flooding from dam repairs and wetland construction for stormwater retention



**Economic Benefits**

Design and construction of the improvements to the various components of the Carlls River Tributary will create temporary jobs for a period of two years or more. The resiliency improvements planned for the watershed will reduce future storm-related emergency and recovery costs for the Town and Village of Babylon by reducing local flooding. As a result, the project would reduce the amount of time, energy, and costs required to navigate and provide services during floods.

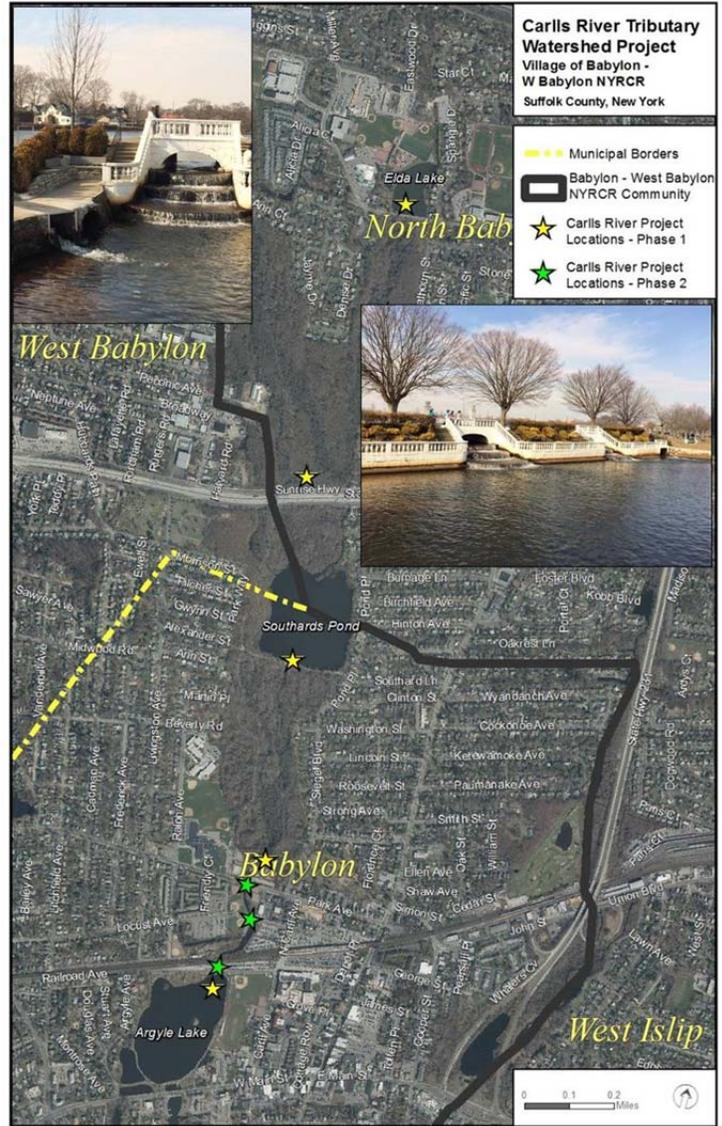
**Environmental Benefits**

The proposed infrastructure improvements to the watershed will reduce risk and enhance the Carlls River tributary water quality and flow management. The project could potentially improve local water quality, which benefits all residents within the community and the greater watershed, including the Great South Bay. The construction of stormwater wetlands at NYS Route 27 and Carlls River will be critically important to the ecological health of the Carlls River watershed. The stormwater wetlands can help support and expand avian and aquatic wildlife in the area.

**Health and Social Benefits**

This project is intended to reduce flood risk to housing located within the Extreme and High risk areas. Based on the number of homes located in the Extreme and High risk areas as well as population data from the 2010 U.S. Census, 2,700 residential structures, home to approximately 7,830 Babylon residents, could potentially benefit from this project.

**Figure 10: Carlls River Tributary Watershed Project**





### Cost Benefit Analysis

The Carlls River watershed is a critical element of the Community's natural environment. The preservation and enhancement of the watershed would have numerous direct benefits (reduced flooding of adjacent neighborhood and community assets) and co-benefits (stabilizing property values/tax ratables, preserving critical environmental areas and habitats, and recreational activities for the community) that support the conclusion that this project is a good investment.

### Risk Reduction Analysis

This multi-phase infrastructure project will provide significant risk reduction to residential areas, commercial assets, major and secondary road corridors, LIRR infrastructure and protection of park/open space assets. There are several assets anticipated to be positively affected by the implementation of this project. Enhanced flooding protection from 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 of secondary roads in the Extreme risk areas as well as Argyle Lake Park. With a total area greater than 15 square miles, the Carlls River watershed is a sprawling and extensive natural system. As a result, the preservation and enhancement of the watershed reduces risk throughout much of the NYRCR Community.

### General Timeframe for Implementation

It is estimated that, from the time implementation begins, this project could be implemented in the long-term (36 months or longer). Engineering plans will first need to be prepared (6-8 months). Engineering plans are then 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 then be constructed per the contractor schedule submitted during the bidding process. Construction is anticipated to take at least 15-18 months, depending on the project design, time of year, weather, or other variable factors.

### Regulatory Requirements Related to Project

This project is anticipated to require permits and approvals from the NYS DEC, NYS DOT, the Village of Babylon, and the Town of Babylon. Partnership and agreement with NYS DOT to construct wetlands on NYS DOT property will be required. Review of plans will also be required by the New York State Office of Parks, Recreation & Historic Preservation (NYS OPRHP) if the project impacts State parkland and/or parkways. Otherwise, no additional constraints anticipated.

### Jurisdiction

Town of Babylon and Village of Babylon



## **FEATURED PROJECT: West Babylon Hamlet Open Space Acquisition/Stormwater Park**

### **Project Description**

This Featured Project is Phase 2 of the Proposed Project: West Babylon Hamlet Open Space Acquisition/Stormwater Engineering Study and Pilot Green Infrastructure Project. Subsequent to property acquisition, the project scope would include the construction of a stormwater wetland/open space park, which would provide enhanced stormwater quality treatment and management, and passive park improvements (i.e., elevated boardwalk trail network, interpretative signage, etc.). The project will provide improved infrastructure, cultural, and educational benefits and serve as an economic stimulus along the Montauk Highway corridor.

### **West Babylon Hamlet Open Space Acquisition/Stormwater Park**

**Recovery Support Function:** Economic Development

**Estimated Cost:** \$5,000,000

**Assets Made More Resilient:** Streets in the Extreme risk area in the West Babylon hamlet

#### **Risk Reduction & Benefits:**

Decreased vulnerability to flooding through stormwater quality improvements and stormwater runoff reduction

The technical feasibility of this project would be determined by the results of the initial pilot project as proposed above. This project would also ultimately involve the acquisition of property for an open space stormwater retention area and hamlet center. The project is anticipated to be reasonably feasible.

### **Estimated Project Costs**

\$5,000,000 (Note: The final scope of the stormwater wetland and park will be determined by the results of the pilot project.)

### **Project Benefits**

#### **Risk Reduction Benefits**

This project will result in stormwater quality improvements and stormwater runoff reduction with demonstration combined street tree/stormwater storage structures and rain garden treatments adjacent to sidewalk areas along Montauk Highway and Bergen Avenue. Ultimately, the long-term goal is the acquisition of property at the southeast quadrant of Montauk Highway and Bergen Avenue to construct a large-scale stormwater wetland and park to serve as a hamlet center. This project would have multiple benefits, including improved stormwater management, enhanced open space, expanded educational opportunities, and increased economic stimulus along the corridor.



This project is anticipated to reduce flood risk to streets in the Extreme risk area in the West Babylon hamlet, particularly along Montauk Highway and Bergen Avenue. The stormwater runoff reduction resulting from this project is expected to significantly reduce the vulnerability of secondary streets in the Extreme risk area.

**Economic Benefits**

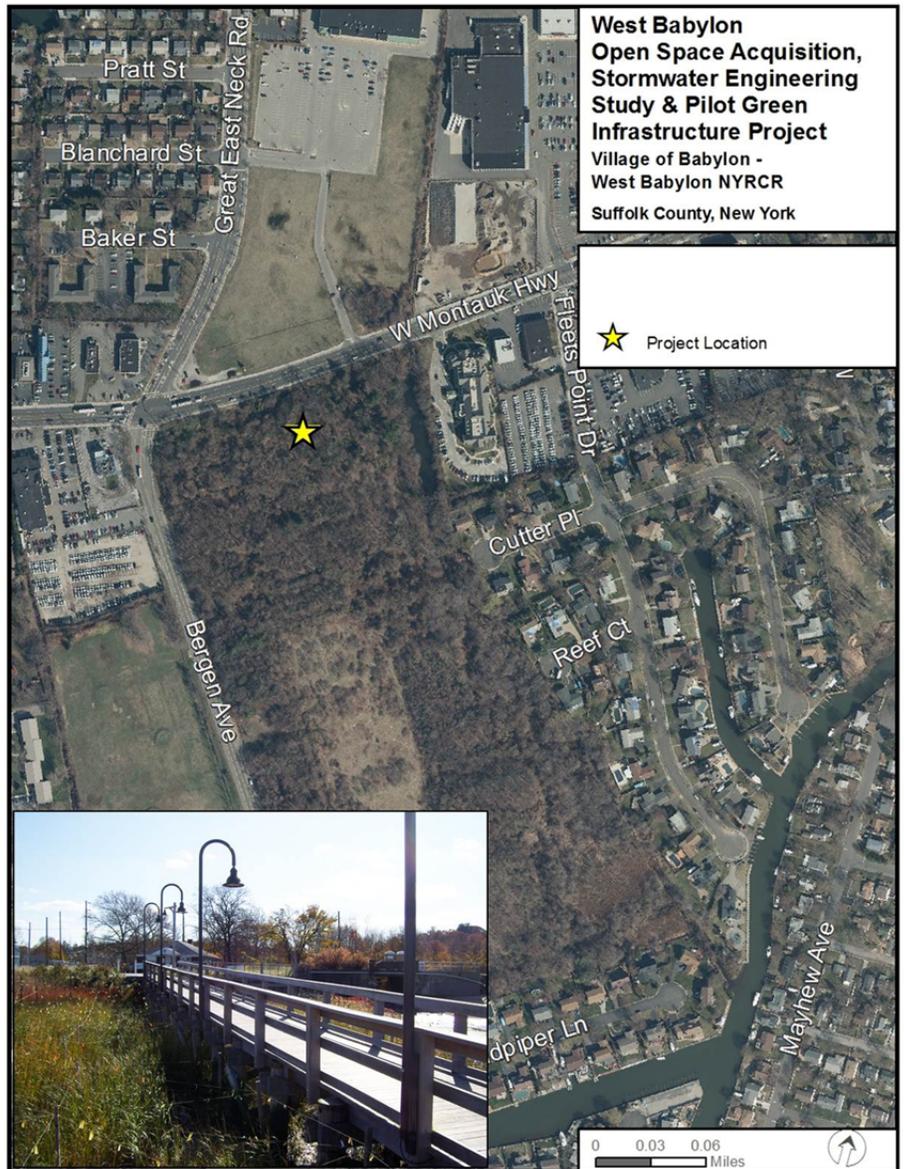
Designating and supporting the creation of a hamlet center for West Babylon could be a catalyst for economic development in the community, which currently has no area that is considered to be the center of town or a “downtown.”

**Environmental Benefits**

The integration of a stormwater retention area and rain gardens within the proposed West Babylon hamlet center would alleviate some of the negative environmental

impacts of stormwater runoff by retaining a larger percentage of stormwater and by reducing flood risk in the area. The project could potentially improve local water quality, which would benefit all residents within the Community and the greater watershed, including the Great South Bay.

Figure 11: West Babylon Open Space Acquisition





### Cost Benefit Analysis

West Babylon residents have expressed a desire to develop their community identity, particularly after the damaging Superstorm Sandy caused to local commercial areas. West Babylon's commercial district along Montauk Highway is an ideal location to invest in a key open-space area, with the goal of anchoring a "downtown" for the hamlet.

An investment of \$5,000,000 in West Babylon will lay the groundwork for an enhanced hamlet identity, increased economic activity, and improved stormwater management. The potential benefits of this project outweigh the costs.

### Risk Reduction Analysis

The project would help to reduce flooding along the Montauk Highway corridor, thereby reducing risks to nearby housing in the Extreme and High risk areas, businesses, and the local street network itself. The potential for increased economic activity is also an important component, as the project will help to reduce risk to any new investment in the area.

### General Timeframe for Implementation

It is estimated that, from the time implementation begins, this project could be implemented in the long-term (36 months or more). The property acquisition timeframe can not yet be established due to unknown factors, such as whether eminent domain will be required. Following property acquisition, engineering plans will be submitted to regulatory agencies for review and permit approval (3-6 months). Upon receiving regulatory and permit approvals (3-4 months), 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 12-24 months, depending on the project design, time of year, weather, or other variable factors.

### Regulatory Requirements Related to Project

This project is anticipated to require permits or approvals from the NYS DOT, the Suffolk County Department of Public Works, and the Town of Babylon.

### Jurisdiction

Town of Babylon



## FEATURED PROJECT: *Complete Streets Infrastructure Project*

### Project Description

This project involves the implementation of a comprehensive program of innovative and green stormwater infrastructure improvements including permeable pavement treatments, bicycle lanes, trolley service, LED lighting, and streetscape improvements strengthening the connection between the Village of Babylon’s Main Street and the Village waterfront.

The preliminary determination is that this would be a technically feasible project, because the Village of Babylon owns all affected roads within the project scope and the proposed project components have been implemented in multiple locations across the United States.

### Estimated Project Costs

\$3,000,000

### Project Benefits

#### **Risk Reduction Benefits**

Implementation of a “complete streets” project in Babylon Village is anticipated to reduce the vulnerability of several key assets including housing in all risk areas, secondary streets, and commercial districts. The permeable pavement and rain garden treatments are anticipated to reduce stormwater runoff, which should reduce the risk of flooding during extreme storm events. Improved stormwater management is anticipated to reduce the vulnerability to flooding for streets in the Extreme risk area.

### Complete Streets Infrastructure Project

**Recovery Support Function:** Infrastructure

**Estimated Cost:** \$3,000,000

**Assets Made More Resilient:** Residences in all risk areas within the Village of Babylon, waterfront, and downtown commercial areas, and streets in the Extreme risk area

#### **Risk Reduction & Benefits:**

Decreased vulnerability to flooding through the implementation of permeable pavement and rain garden treatments

Increased economic resiliency with enhanced tourism activity



**Complete Streets Infrastructure**  
(Photo Credit: Pedestrian Bicycle Information Center)



## FEATURED PROJECT: *Complete Streets Infrastructure Project*

### Project Description

This project involves the implementation of a comprehensive program of innovative and green stormwater infrastructure improvements including permeable pavement treatments, bicycle lanes, trolley service, LED lighting, and streetscape improvements strengthening the connection between the Village of Babylon’s Main Street and the Village waterfront.

The preliminary determination is that this would be a technically feasible project, because the Village of Babylon owns all affected roads within the project scope and the proposed project components have been implemented in multiple locations across the United States.

### Estimated Project Costs

\$3,000,000

### Project Benefits

#### **Risk Reduction Benefits**

Implementation of a “complete streets” project in Babylon Village is anticipated to reduce the vulnerability of several key assets including housing in all risk areas, secondary streets, and commercial districts. The permeable pavement and rain garden treatments are anticipated to reduce stormwater runoff, which should reduce the risk of flooding during extreme storm events. Improved stormwater management is anticipated to reduce the vulnerability to flooding for streets in the Extreme risk area.

### Complete Streets Infrastructure Project

**Recovery Support Function:** Infrastructure

**Estimated Cost:** \$3,000,000

**Assets Made More Resilient:** Residences in all risk areas within the Village of Babylon, waterfront, and downtown commercial areas, and streets in the Extreme risk area

#### **Risk Reduction & Benefits:**

Decreased vulnerability to flooding through the implementation of permeable pavement and rain garden treatments

Increased economic resiliency with enhanced tourism activity



**Complete Streets Infrastructure**  
(Photo Credit: Pedestrian Bicycle Information Center)



### ***Economic Benefits***

This project is expected to increase the economic resiliency of the Village Main Street commercial district and the Village waterfront commercial enterprises and to allow for increased multi-modal connectivity, which would allow residents to travel to commercial centers even with gas shortages, which happened after Superstorm Sandy.

### ***Environmental Benefits***

The integration of permeable pavement and rain gardens within the complete streets design aims to alleviate some of the negative environmental impacts of stormwater runoff by retaining a larger percentage of stormwater than a normal street design. Additionally, complete streets encourage the use of non-motorized transportation options, such as bicycling and walking—reducing motor vehicle traffic and improving local air quality.

### ***Health and Social Benefits***

There are multiple health co-benefits promoted by the implementation of complete street design principles. Redesigning streets to make it safe for walking and bicycling has been shown to improve safety for all road users by reducing crashes. Supporting regular physical activity, such as walking and biking, can have several positive physical and mental benefits, including weight control, reducing the risk of cardiovascular disease, type 2 diabetes, reducing the incidence of other illnesses, improved mood, and increased longevity. Lastly, improvements in local air quality resulting from a reduction in motor-vehicle traffic can help reduce the incidence of asthma attacks.

### **Cost Benefit Analysis**

Once implemented, this project will have numerous benefits including improved public health and safety, increased multi-modal mobility, and reduced flooding from stormwater. Together, these improvements provide both public and private benefits stretching across several of the identified Recovery Support Functions, including health and social services, economic development and infrastructure. The many benefits of this project outweigh its costs.

### **Risk Reduction Analysis**

Once fully implemented, this project will reduce risks to Village of Babylon housing in all risk areas, secondary streets, and commercial districts. In addition to reduction of risks to key assets, the implementation of this project is anticipated to improve multi-modal circulation and reduce the local street network's risk to flooding. With safety as a primary goal of any complete streets project, this proposed project reduces risk for all residents and visitors in the Community. However, such streetscape improvements are particularly beneficial to vulnerable populations, such as the elderly and disabled.



### General Timeframe for Implementation

It is estimated that, from the time implementation begins, this Project has potential for immediate implementation (0 to 12 months). Engineering and landscape architecture plans will be submitted to the Town for review and permit approval (2 months). Upon receiving regulatory and permit approvals, bid documents will be prepared and contractor(s) to conduct the work will be selected (2 months). The project will then be constructed per the contractor schedule submitted during the bidding process. Construction is anticipated to take 6-8 months, depending on the project design, time of year, weather, or other variable factors.

### Regulatory Requirements Related to Project

Appropriate permits and approvals would be necessary from the Village of Babylon.

### Jurisdiction

Village of Babylon



## Section 5: Additional Materials

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***Home Elevation***

*(Photo Credit: NYS DOS/Patricia Bowie)*



**A. ADDITIONAL RESILIENCY RECOMMENDATIONS**

Table 22: Additional Resiliency Recommendations

Strategy	Project Name	Short Description	Cost Estimate	Regional (Y/N)
Identify and repair, replace or enhance critical shoreline stabilization infrastructure	Fred Shore Beach Club Shoreline Stabilization	Bulkhead and living shoreline improvements in coordination with Little East Neck Road Terminus Stabilization Proposed Project.	\$500,000	N
Reinforce Bergen Point Wastewater Treatment Plant	Bergen Point Wastewater Facility	Work with Suffolk County to increase resiliency of Critical Facility Southwest Sewer District 3 Plant at Bergen Point, to prevent wastewater release following storm.	\$242,000,000	Y
Improve and link local emergency communication systems to disseminate warnings and evacuation notifications, coordinate emergency response provide timely status updates and assist in recovery efforts	Develop Alert System	Develop an automated call/text emergency alert system to enable a more resilient communication system.	\$100,000	Y
	Great South Bay HAM Radio Club	Purchase equipment and supplies to provide emergency communication for shelters and first responders, Town of Babylon and Village of Babylon government entities.	\$50,000	Y
Repair, enhancement and/or relocation of infrastructure to reduce flooding	Updated Drainage / Road Raising Engineering Study	Engineering study on the feasibility of elevating municipal roads and right of ways within the 100-year flood zones.	\$250,000	Y



Table 22 (cont'd)

Strategy	Project Name	Short Description	Cost Estimate	Regional (Y/N)
Create a centrally-located, town-wide/regional emergency disaster facility to provide space for recovery organizations, supply storage, and temporary sheltering by re-purposing an existing underutilized building	Acquire 301 Henry Street	Acquire warehouse property at 301 Henry Street for use as a central disaster relief center, supply storage, and short-term shelter during a disaster.	\$1,500,000	Y
Make enhancements to existing facilities so that they can serve as temporary shelters	Fixed Generator – American Legion	Install backup power generation at American Legion. This facility was essential to immediate mobilization following Superstorm Sandy. Provides an in-place command structure and members trained in First Aid allowed for immediate response both on-site and mobile.	\$250,000	N
	First Presbyterian Church of Babylon (Town of Babylon FEMA VOAD Center)	Install back up power generation. Upgrade bathroom facilities to allow for immediate relief, first aid, and response.	\$400,000	N
	West Babylon Junior/Senior High School	Upgrade West Babylon Junior/Senior High School from a Tier 3 to a Tier 1 Facility by updating and improving the site to include backup power generation and bath/shower facilities.	\$500,000	Y



**B. MASTER TABLE OF PROJECTS**

Table 23: Master Project Table

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Strengthen And Harden Electrical Infrastructure To Protect Key Assets Within The Downtown Village Commercial District	Microgrid Engineering Feasibility Study	Prepare engineering feasibility study to define scale, infrastructure requirements, ownership, capital costs, and operational requirements/costs associated with proposed microgrid implementation.	Proposed	\$50,000	N
Adequately Equip Municipalities and First Responders for Natural Disasters	Village of Babylon Emergency Response and Rescue Equipment and Fixed Generators	Purchase of specialized emergency response equipment and disaster recovery equipment to address existing equipment deficiencies and to facilitate a greater capacity of services and improved response during and after events. Additionally, fixed generators will provide continuous operations to deliver optimal emergency response services.	Proposed	\$919,000	N
	Village of Babylon Department of Public Works Fixed Generator	Purchase and install fixed generator for backup power at the Village of Babylon Department of Public Works building.	Proposed	\$200,000	N



Table 23 (cont'd)

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Adequately Equip Municipalities and First Responders for Natural Disasters  <i>continued</i>	West Babylon Fire Department Emergency Response and Rescue Equipment	Purchase of specialized emergency response equipment and disaster recovery equipment to address existing equipment deficiencies and to facilitate a greater capacity of services and improved response during and after events.	Proposed	\$180,000	N
	Town of Babylon Division of Fire Prevention Emergency Response and Rescue Equipment	Purchase of specialized emergency response equipment and disaster recovery equipment to address existing equipment deficiencies and to facilitate a greater capacity of services and improved response during and after events.	Proposed	\$1,005,000	Y
	Cedar Street Property Acquisition and Construction of Emergency Equipment Garage – Babylon Fire Department	Acquire property adjacent to the Cedar Street Fire House and the construct a new garage facility addressing the lack of storage for specialized emergency equipment and facilitating emergency response and mobilization of equipment.	Proposed	\$700,000	N
	West Babylon Fire Department EMS Facility	Construct a freestanding EMS Building directly adjacent to the West Babylon Firehouse.	Proposed	\$1,000,000	N



Table 23 (cont'd)

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Integrate “Green” and “Gray” Infrastructure to Holistically Manage Water Flow within the Local Watershed	Carlls River Tributary / Watershed Project (Phase I)	This is a multi-component infrastructure project that involves the repair of flood gate/controls at Argyle Lake and Southards Pond, dam repairs at Argyle Lake and Elda Lake, and the construction of stormwater wetlands at NYS Route 27.	Proposed	\$3,505,000	Y
	Town-wide and Village-wide Coastal Outfall Backflow Infrastructure	This project will install in-line backflow valve infrastructure at 51 coastal outfalls into the Great South Bay and adjoining canals.	Proposed	\$1,610,000	Y
Repair and Enhance Critical Shoreline Infrastructure	Araca Road (Dalton Point) Shoreline Stabilization	This project will preserve key open space parcels, proposed to be acquired by the Village, located on both sides of the terminus of Araca Road by stabilizing the shoreline with bulkhead and living shoreline treatments and addressing existing erosion problems.	Proposed	\$925,000	N
	Little East Neck Road Shoreline Stabilization	This project will use a combination of bulkhead and living shoreline treatments to protect the road integrity, mitigate erosion, and provide property line stabilization along the street side of the Fred Shore Beach Club property adjacent to Little East Neck Road.	Proposed	\$457,000	N



Table 23 (cont'd)

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Repair and Enhance Critical Shoreline Infrastructure  <i>continued</i>	Venetian Shores Park Shoreline Engineering Study and Pilot Constructed Dune Project	This project includes the preparation of an engineering study to develop innovative long-term shoreline stabilization improvements and a pilot project that would include the construction of an engineered planted dune in two locations.	Proposed	\$180,000	Y
Improve the Reliability of Communication Systems for Natural Disasters	Babylon Central Alarm – Upgrade to Communications Infrastructure	This project includes critical upgrades to the existing communications infrastructure serving ten (10) member Fire Departments within the Town of Babylon.	Proposed	\$257,000	Y
Create Hamlet Identity for West Babylon	West Babylon Hamlet Open Space Acquisition/Storm water Engineering Study and Pilot Green Infrastructure Project	The initial phase of this project would involve the preparation of an engineering study to develop the scope of an innovative open space/ stormwater infrastructure project with an initial pilot scope of rain gardens/ bioswales & combined stormwater/street tree structures in the vicinity of Bergen Avenue and Montauk Highway.	Proposed	\$250,000	N
Strengthen Community Resiliency through the Implementation of Innovative Infrastructure Improvements	Complete Streets Engineering Study and Pilot Green Infrastructure Project	The project would involve the preparation of an engineering study to develop a comprehensive scope for a “complete streets” project and the pilot scope would include the construction of permeable pavement and rain gardens at key intersection(s).	Proposed	\$250,000	N



Table 23 (cont'd)

Strategy	Project Name	Short Description	Project Category	Estimated Cost	Regional (Y/N)
Strengthen Community Resiliency through the Implementation of Innovative Infrastructure Improvements <i>continued</i>	Complete Streets Green Infrastructure Project	Implementation of a comprehensive menu of innovative/green stormwater infrastructure components and complete streets improvements to strengthen connection between Main Street and the Village waterfront.	Featured	\$3,000,000	N
Strengthen And Harden Electrical Infrastructure To Protect Key Assets Within The Downtown Village Commercial District	Microgrid Implementation	Implementation of the microgrid infrastructure. Energy infrastructure details, transmission, limits of distribution, ownership, operations, etc. will be determined by the Engineering Study performed.	Featured	\$10,000,000	N
Integrate "Green" and "Gray" Infrastructure to Holistically Manage Water Flow within the Local Watershed	Carlls River Tributary / Watershed Project (Phase II)	Includes the replacement of key culvert crossings, the expansion/ widening of the LIRR culvert, and the construction of stormwater wetlands at Carlls River NYS Parkland (filled wetlands) just south of Elda Lake.	Featured	\$3,000,000	Y
Create Hamlet Identity for West Babylon	West Babylon Hamlet Open Space Acquisition/Storm water Engineering and Green Infrastructure Project	Subsequent to property acquisition, the project would include the construction of a stormwater wetland/open space park and passive park improvements.	Featured	\$5,000,000	N



### C. PUBLIC ENGAGEMENT PROCESS

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Governor Cuomo has been a strong proponent of bottom-up, community-driven planning; in other words, the real “experts” are the residents of the communities that have been confronted first-hand by these natural disasters. A critical component, therefore, of the NYRCR Program is the exchange of information between the the Committee, the State, the Consultant Team, and the public to identify appropriate projects, strategies, and solutions that are likely to carry community support. The public in this case is defined as area residents, employees, civic groups, neighborhood and homeowner associations, environmental and other interest groups, business interests, governmental agencies, educational, medical, religious, and other institutions, the media, elected/appointed officials, as well as other stakeholders who express interest in the process.

As part of its Public Engagement strategy, the Committee:

- Established the means to engage and facilitate information sharing with the public throughout the development of the NYRCR Plan;
- Educated the public and elicited public comments and suggestions regarding all aspects of the Plan within the NYRCR Communities;
- Employed outreach techniques that allowed for collection and coordination of public communication and comments; and
- Reached out to groups that might normally be underrepresented in a planning study, such as minorities, non-English speaking residents, low-income residents, seniors, youth, and the disabled

The Committee utilized a number of dissemination techniques to achieve a thorough, responsive, open, and transparent communication process.

#### Committee Meetings

Planning Committee Meetings were held on a regular basis. 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 event planning and feedback, NYRCR Conceptual Plan development, strategies, projects, and costs.

The following Village of Babylon/West Babylon NYRCR Program Committee meetings were held, all at The First Presbyterian Church of Babylon, Babylon, NY:



- Preliminary Meeting with the Committee, Tuesday, August 13, 2013, 12:00 PM
- Committee Meeting 1, Wednesday, August 28, 4:00 PM
- Committee Meeting 2, Wednesday, September 11, 4:00 PM
- Committee Meeting 3, Wednesday, September 25, 4:00 PM
- Committee Meeting 4, Wednesday, October 9, 4:00 PM
- Committee Meeting 5, Wednesday, October 30, 4:00 PM
- Committee Meeting 6, Wednesday, December 4, 7:00 PM
- Committee Meeting 7, Tuesday, January 14, 2014, 4:00 PM
- Committee Meeting 8, Wednesday, February 12, 7:00 PM
- Committee Meeting 9, Wednesday, March 5, 4:00 PM
- Committee Meeting 10, Scheduled for Wednesday, March 26, 4:00 PM

All Committee Meetings were open to the public, with meeting dates and times posted on the NYRCR website (<http://www.stormrecovery.ny.gov/nyrcr>). For each Committee Meeting, notifications were sent and meeting materials were prepared. They included agendas, sign-in sheets, minutes, comment log, PowerPoint presentations, graphics/boards, and handouts. The public was invited to comment on the work of the Committee by filling out a comment form available at each Committee Meeting.

The Committee also formed several subcommittees to explore certain topics in further detail, which included a joint Babylon/West Babylon Subcommittee, Infrastructure Subcommittee, Microgrid Subcommittee, and the Public Outreach Subcommittee.

### Public Engagement

While the Committee represents the interests of many, it was important to provide opportunities for the public to participate in the development of the Plan. While the primary vehicle was Public Engagement Events, additional outreach opportunities for comment were provided through online venues such as the NYRCR website. Several Committee Members, for



***Building Back Better***

*(Photo Credit: New York State Department of State)*

instance, organized a region-wide outreach and education event in late 2013, specifically to reach,



educate, and assist vulnerable populations— those who may not have access to government programs and other sources of assistance. Jon Kaiman, Governor Cuomo’s Special Advisor for Long Island Storm Recovery, spoke at the event, and representatives from the Governor’s Office of Storm Recovery and several charitable organizations provided information and assistance. Over 500 people attended the event, from as far west as Staten Island and New Jersey, and as far east as Mastic/Shirley, and all points in between.

### Public Engagement Events

Each Public Engagement Event included a presentation of work done to date and an opportunity for attendees to provide feedback. Each Public Engagement Event was preceded by public notice (including press releases, announcements, individual mailings, and other appropriate means) and outreach to underserved communities and displaced stakeholders. At each Event, information was gathered from those attending, feedback was collected for inclusion in the ongoing planning process. Public Engagement Events were scheduled to coincide with major milestones. Event materials were available in English and if requested, in Spanish.

Presentation materials were developed for each event that illustrated the key points of the information presented using plain language, graphics, simulations, etc. These were available following the event on the NYRCR website for download.

The process included a series of four Public Engagement Events:

1. To define the Community Vision and solicit initial input on the asset inventory and assessment of risk to community assets;
2. To solicit input from the public concerning the content of the Conceptual Plan;
3. To confirm projects and implementation frameworks; and
4. To present the Final Plan

Outreach for Public Engagement Events included: posting on the State NYRCR 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 libraries, community centers, and other centers of activity; e-mails and/or texts to lists available from chambers, civics, school districts, churches, synagogues, American Legion, VFW, AARP, Hibernians, and other community leaders. Outreach also included requests to community organizations to post information on their websites. Phone calls were made to elected officials and other key players in the local residential and business community and calls to each Committee member to assist them with their outreach effort (e.g., calls/e-mails to their contacts and announcements at their events).



***Town of Babylon Public Engagement Event***

Each Public Engagement Event was formatted as an open house that the public could attend during any part of the allotted two to three hours. Stations were positioned around the room for the various topics. Committee members, municipal representatives, State planners, and the NYRCR Consultant Team were present at each station to provide opportunity for the community to exchange ideas in a comfortable setting. This structure provided an opportunity for each attendee to work within their own schedule and comment on all or some of the specific aspects of the process in a meaningful way.

As the project progressed, the public was presented with maps, a geographic scope, community assets, risk to assets, and a vision statement, needs and opportunities, strategies and projects that had been vetted and/or created by the Committee. The desired outcome of each Public Engagement Event was to obtain the public's reactions and feedback to the Committee's work in order to incorporate their input. Comments were compiled by the NYRCR Consultant Team and provided to the Committee in a clear and comprehensive manner at follow-up Committee meetings. The Committee reviewed the public's feedback and incorporated it into the NYRCR Plan. The schedule for the first three Public Engagement Events was as follows:

### **Event #1, Thursday, September 26, 2013**

This public open house workshop was focused on gathering the public's knowledge, experience, and recommendations that are essential in the development of the NYRCR Plan. The public was invited to provide input on the Community Reconstruction Planning Committee's work to date, including the draft Community Vision, Community Assets, and Needs and Opportunities.



Approximately 100 community members attended the event and it was observed that attendees were pleased with the resources that were made available, receptive to the planning work to date, and engaged in discussions with their Committee members and fellow community members alike.

### **Event #2, Thursday, November 7, 2013**

This public open house workshop was focused on presenting each of the three New York Rising Community Reconstruction (NYRCR) Program Community Conceptual Plans in the Town of Babylon and allowing the public to respond to the content of these plans. Approximately 300 Community members attended the event and it was observed that attendees were actively engaged in reviewing the materials available, eager to discuss the project with Committee Members and interested in providing input to the planning process.

Public Engagement Event #2 was a joint meeting with the Town of Babylon Communities of the Village of Amityville/Copiague, the Village of Babylon/West Babylon, and the Village of Lindenhurst. These three Communities are in close geographic proximity to each other and have similar issues and needs regarding resiliency. These Communities are also similar in regard to the fact that areas south of Montauk Highway are all predominantly within the Extreme and High risk areas, all three communities suffered extensive damage in these areas and finally, large areas existing within each community contain damage from the storm that has yet to be remediated. This combined Community meeting format allowed all the attendees to see what each of the three Planning Committees has done to date. Viewing and listening to the strategies and projects from other similar communities permitted attendees to consider applicability of these concepts in their Community.

### **Event #3, Monday, February 24, 2014**

The third public engagement meeting was held at Lindenhurst High School on February 24th from 5 PM to 7 PM and was hosted in a public open house workshop format. Committee members hosted a highly engaged public, providing updates on the overall NYRCR planning process, an overview of the Risk Assessment and Reduction Analysis and detailed overviews of proposed and featured Projects. Committee members were instrumental in explaining to the residents of the Community how proposed projects and featured projects were formulated through the NYRCR planning process. Residents were encouraged to complete a Project Questionnaire after review of the projects, as their review would be incorporated as projects continue to be refined. Committee members also asked residents to participate in the online meeting and encourage their neighbors and stakeholders in the Community to do the same.

**The fourth Public Engagement Event is planned for after the release of this Plan.**



### Online Meeting

After seeing the success of the online meetings with the Fire Island NYRCR Community, the other Suffolk County NYRCR Communities utilized an online meeting format to accompany the third public engagement event. The overall format for the online events provided a digital open house that could be attended at any time 24 hours a day, seven days a week, for a ten-day timeframe.

The Online Public Meeting provided identical stations to the in-person meeting. Respondents were asked to identify their community and were able to view the Planning process and comment on all of the materials provided. The Online Meetings provided valuable comments, which were summarized for the Committee's review and consideration in the planning process. There were 17 respondents to the online meeting survey for Babylon/West Babylon.

### Expert Sessions

**Power (Electric/Gas) Resiliency Education Session:** Held on Tuesday, December 17, 2013 at the West Islip Community Center on Higbie Lane. Over 30 members from the various Suffolk County NYRCR Planning Committees were in attendance. The education session focused on National Grid/LIPA (operated by PSEG Long Island as of January 1, 2014) lessons learned post-Superstorm Sandy as well as current and future hardening projects/initiatives that are being undertaken by the utilities within the County. Committee members who attended stated that the session was valuable in understanding how hardening infrastructure or raising a road can impact the utilities below the road. Other Committee members indicated that it was valuable to meet other Suffolk NYRCR Committee Members from adjacent Communities.

**Flooding & Erosion Protection Education Session:** Held on January 21, 2014, at the West Islip Fire Department, 309 Union Boulevard in West Islip. Representatives from Sea Grant gave an innovative presentation about ongoing and future treatments of the natural shoreline. The presentation also noted that Long Island's coastline is home to a dynamic variety of habitats that supports a range of plants and animals, some of which are endangered and threatened. The shoreline contains heavily developed urbanized barrier islands to the Otis Pike Fire Island High Dune Wilderness, the State's only federally-designated wilderness area. Sea Grant stressed the interplay between the natural and built environments that converge at the "living edge."

The Nature Conservancy provided information about wetlands restoration and the NYS DEC discussed the permitting requirements and thresholds for approval for various types of projects being considered by the Committees.



### Other Considerations

Although the events were advertised as events for the NY Rising Community Reconstruction Program, there were attending community members who were also interested in assistance with individual property concerns. To accommodate these individuals, at each Public Engagement Event tables were available in a separate area for State, FEMA, and NGO staff from the various intake centers to provide individual assistance. These community members were subsequently encouraged to participate in the NYRCR planning process.

### Website

The NYRCR website will serve as a repository for downloadable versions of all public information, event, and event notifications. Posted materials include an overview of the planning process, reports, maps, and documents, summaries of Public Engagement Events, notices of Public Engagement Events, and contact information. The website includes an area to accept public comment, as well as a section for Frequently Asked Questions (FAQs). All materials and information on the website is kept up to date. The address is: <http://www.stormrecovery.ny.gov/nyrcr>.

### Print and Broadcast Media

Study information was also disseminated through selected local, print, radio, and TV media to keep the community informed and to respond to media inquiries. A particular effort was made to include publications, radio, and TV stations that targeted those populations traditionally underrepresented in outreach efforts.

### Outreach Techniques for Receiving Input

An important component of the outreach program was to understand public sentiment and to be able to answer questions and address public concerns. Several methods were provided for the public to make comments and ask questions. Comments were reviewed by the Committee, and used to enhance and improve the NYRCR plan.

### NYRCR Staff Communication

The NYRCR Staff is available to directly answer specific questions and receive comments. The primary contact for the NYRCR Staff is the NYRCR Suffolk County Regional Lead.

### E-Mail

E-mail comments and requests for information can be sent to the State's e-mail address at: [info@stormrecovery.ny.gov](mailto:info@stormrecovery.ny.gov). This email address is prominently displayed on the website so that it is widely disseminated and available for public use.



### Comment Forms

Comment forms were available at Committee meetings and Public Engagement Events and on the state's website to provide an opportunity for the public to contribute their thoughts, which were then passed along to the Committee and the NYRCR Consultant Team.

### Requests for Information

All requests for information were acknowledged by the NYRCR Consultant Team within a week with a letter or email accompanied by the materials requested or by a referral to the State's website where the material can be downloaded. If a response to the request required more than a week, the individual making the request would be contacted with an estimate of the anticipated delivery date. An offer was always made to provide further assistance should it be necessary.



### D. COMMUNITY ASSET INVENTORY

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Based on the direction provided by the State, the development of the asset inventory and subsequent risk assessment process followed a specific methodology, which is outlined below.

#### Pre-Screening/Data Management

The NYRCR Consultant Team used the asset inventory compiled as part of the Conceptual Plan as a baseline in which to identify assets that may potentially be inputted into the Risk Assessment Tool. The pre-screening was designed to advance assets that were either:

- Situated in Extreme and High Risk Areas;
- Critical Assets (FEMA-critical) in Moderate Risk Areas;
- Locally-significant community identified (High Community Value) in Moderate Risk Areas;
- Assets with High Community Value in Non Risk Areas; or
- Life safety services

The asset inventory included in the draft Conceptual Plan was based both on community-identified assets and state identified assets. The assets catalogued in the draft Conceptual Plan included basic data such as Community, asset name and type, asset category, as well as risk area and asset class. As previously indicated, as an initial data management step, all Community and State identified assets were consolidated into one database.

Assets filtered out included those that fell outside of Extreme, High or Moderate risk areas or were non-critical assets located in Moderate risk areas. As previously mentioned, Committee-identified or locally significant high value assets were also included.

#### Assets Groups

Similar assets were grouped as a single asset to the maximum extent possible because these assets would likely experience the same effects from storm events and have similar vulnerabilities. Examples included:

- Street network or electric infrastructure with similar construction and exposure;
- Residential neighborhoods or business districts by risk area; and
- Campuses (multiple buildings/schools on one campus)

In the event that a building or parcel spanned multiple risk areas, the “worst-case or more at-risk” risk area was used for the purposes of analysis.



### Community Value in the Village of Babylon and West Babylon

During Committee Meeting #6 held on December 4, 2013, the Committee participated in a Community Value and Critical Asset pilot exercise. During this exercise, a Critical Assets Worksheet containing roughly 24 asset classes was distributed to the Committee to complete. The contents of critical asset classes were developed using a collaborative approach with the Committee. Similarly, asset classes were also presented at Public Engagement Event 2 (November 7, 2013) in order to solicit verbal commentary from the public on the community value placed on assets and their importance relative to the resilience of the locality.

The various asset classes included a number of facilities and facilities ranging from fire departments to housing, businesses, and schools (see attached worksheet). The purpose of this exercise was to get the Committee to think about each asset class and its importance relative to the resiliency of the community. Committee members were presented with worksheets with asset value definitions (see below) and then asked to identify each asset class as high, medium, or low value.

**High Value Community Asset:** *Asset(s) that are 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.*

**Medium Value Community Asset:** *Asset(s) that are important to the functioning of that 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 whose function could be replaced or duplicated in a mid-term time frame without significant burden to a community's long-term health*

**Low Value Community Asset:** *Assets(s) that 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 final tabulation of Committee responses included four Low Value assets, twelve Medium Value assets and eight High Value assets.

### Using the Risk Assessment Tool

The dual purpose of the Risk Assessment Tool was: (1) to provide risk information as a means to identify and prioritize management measures; and (2) to provide a standardized risk assessment process for the NYRCR Program.

As previously mentioned, the assets catalogued in the NYRCR Conceptual Plan included preliminary data such as community, asset name and type, asset category, as well as risk area and asset class. This task included a review of GIS datasets, aerial imagery, and public/Committee input. Most of the risk



assessment tool fields were populated using appropriate data from the consolidated database. Two important aspects to the tool are how to accurately determine the exposure and vulnerability scores.

### 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 included 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 Committee.

### Hazard Score

The hazard score is automatically populated in the Risk Assessment Tool based on the likelihood and magnitude of a 100-year storm event (1% annual chance). For the purpose of the NYRCR Plan, the Hazard Score was equal to three (3), which can be described as a high intensity storm event that is about as likely as not (possible). The probability of this type of storm to occur within the planning timeframe is considered to be 33-66%.

### Vulnerability Score

The vulnerability score of each asset will be determined using State guidance (based on *Table 3: Vulnerability Based on Impact on Service or Function of Community Assets* contained in Guidance for Community Reconstruction Plans) as well as local background knowledge. Vulnerability generally pertains to length of time that a resource is out of service or a reduction in service capacity.<sup>26</sup>

### Risk Score Range

After populating Risk Assessment Tool with attribute information (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 included some subjective analysis. For a 100-year event, the Risk Score ranges from Residual (less than six) to Severe (54 or greater).



# Village of Babylon/West Babylon NY Rising Community Reconstruction Plan

Table 24: Community Asset Inventory

Asset Inventory	Asset Information (see note)*					Landscape Attributes (see note)*		
	Asset Name	Risk Area	Asset Class	Asset Subcategory	Critical Facility	Community Value	Beach Width: Waterline frequently at shore defense or upland vegetation	Vegetation: Protective vegetation, wetlands, or intervening structures between asset & flood source absent
Waterfront Commercial	Extreme	Economic	Marina/Water Based Business	No, Locally Significant	Med	Yes	Yes	Yes
Babylon Village Dock	Extreme	Economic	Marina/Water Based Business	No, Locally Significant	Low	Yes	Yes	Yes
Babylon Beach House - Home for Adults	Extreme	Housing	Senior Housing	Yes, FEMA	High	Yes	Yes	Yes
Venetian Yacht Club	Extreme	Economic	Marina/Water Based Business	No, Locally Significant	Med	Yes	Yes	Yes
Babylon Village Pool	Extreme	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Med	Yes	Yes	Yes
Venetian Shores Park	Extreme	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Med	Yes	Yes	Yes
Marina - Venetian Shores	Extreme	Economic	Marina/Water Based Business	No, Locally Significant	Low	Yes	Yes	Yes
Bergen Point Golf Course & Harbor Club	Extreme	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Med	Yes	Yes	Yes
Marina - 104 boats	Extreme	Economic	Marina/Water Based Business	No, Locally Significant	Low	Yes	Yes	Yes
Great South Bay Shopping Center	Extreme	Economic	Large Business	No, Locally Significant	Med	Yes	Yes	Yes
Microwave Tower, Venetian Shores Park	Extreme	Infrastructure Systems	Telecommunications	No, Locally Significant	Med	Yes	Yes	Yes
West Babylon Residential Housing - Extreme Risk	Extreme	Housing	Single-Family Residence	No, Locally Significant	High	Yes	Yes	Yes
Fred Shore Beach Club	Extreme	Natural and Cultural Resources	Community Centers	No, Locally Significant	Low	Yes	Yes	Yes
West Babylon Residential Housing - High Risk	High	Housing	Single-Family Residence	No, Locally Significant	High	No	Yes	Yes
Suffolk County Sewer District - Radioactive Materials	Moderate	Infrastructure Systems	Wastewater	Yes, FEMA	Med	No	Yes	Yes
Sunrise Senior Living	Moderate	Housing	Senior Housing	Yes, FEMA	High	No	Yes	Yes
West Babylon Fire Department - Station 3	Moderate	Health and Social Services	Emergency Operations/Response	Yes, FEMA	High	No	Yes	No
Options for Community Living Residential Home	Moderate	Housing	Senior Housing	Yes, FEMA	High	No	Yes	No
Babylon Child Care Center	Moderate	Health and Social Services	Daycare and Eldercare	No, Locally Significant	High	No	Yes	No
Working Org of Retarded Children & Adults	Moderate	Housing	Supportive Housing	Yes, FEMA	High	No	Yes	No



# Village of Babylon/West Babylon NY Rising Community Reconstruction Plan

Table 24 (cont'd)

Asset Inventory	Asset Information (see note)*					Landscape Attributes (see note)*		
Asset Name	Risk Area	Asset Class	Asset Subcategory	Critical Facility	Community Value	Beach Width: Waterline frequently at shore defense or upland vegetation	Vegetation: Protective vegetation, wetlands, or intervening structures between asset & flood source absent	Soils: located on a coastal barrier island or filled wetland
Nuclear Cardiology - Radioactive Material	Moderate	Health and Social Services	Healthcare Facilities	Yes, FEMA	High	No	Yes	Yes
Ambulance - EMT	Moderate	Health and Social Services	Emergency Operations/Response	Yes, FEMA	High	No	Yes	No
Babylon Fire Station: Headquarters/Village	Moderate	Health and Social Services	Emergency Operations/Response	Yes, FEMA	High	No	Yes	No
Babylon Fire Dept - Argyle Hose Company	Moderate	Health and Social Services	Emergency Operations/Response	Yes, FEMA	High	No	Yes	No
St. Joseph Nursery School	Moderate	Health and Social Services	Daycare and Eldercare	No, Locally Significant	High	No	Yes	No
Babylon Fire Dept - Cedar St Station	Moderate	Health and Social Services	Emergency Operations/Response	Yes, FEMA	High	No	Yes	No
Nuclear Cardiology - Radioactive Material	Moderate	Health and Social Services	Healthcare Facilities	Yes, FEMA	High	No	Yes	No
Bayview Rest Home - Adults (Assisted Living)	Moderate	Housing	Senior Housing	Yes, FEMA	High	No	Yes	No
American Legion Hall	Moderate	Natural and Cultural Resources	Community Centers	Yes, FEMA	Low	No	Yes	No
LIPA Substation	Moderate	Natural and Cultural Resources	Transportation	Yes, FEMA	Med	No	Yes	No
United Methodist Nursery School	Moderate	Health and Social Services	Daycare and Eldercare	No, Locally Significant	High	No	Yes	No
East Neck Nursing & Rehab Center	Moderate	Housing	Senior Housing	Yes, FEMA	High	No	Yes	No
Bergen Point Sewage Treatment Plant	Moderate	Infrastructure Systems	Wastewater	Yes, FEMA	High	No	Yes	Yes
SCWA Treatment Plant and Wells	Moderate	Infrastructure Systems	Water Supply	Yes, FEMA	High	No	Yes	No
LIPA Substation & Power Generation Facility	Moderate	Infrastructure Systems	Power Supply	Yes, FEMA	High	No	Yes	No
SCWA - Water Tank and Wells	Moderate	Infrastructure Systems	Water Supply	Yes, FEMA	High	No	Yes	No
State Hwy 27	High	Infrastructure Systems	Transportation	No, Locally Significant	High	No	Yes	No
Argyle Lake Park	Extreme	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Med	Yes	Yes	No
Belmont Lake State Park	High	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Med	Yes	No	No
Bergen Point County Park	Extreme	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Med	Yes	No	Yes



Table 24 (cont'd)

Asset Inventory	Asset Information (see note)*					Landscape Attributes (see note)*		
	Asset Name	Risk Area	Asset Class	Asset Subcategory	Critical Facility	Community Value	Beach Width: Waterline frequently at shore defense or upland vegetation	Vegetation: Protective vegetation, wetlands, or intervening structures between asset & flood source absent
Southards Pond Park	High	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Med	Yes	No	No
Village Residential Housing - Moderate Risk	Moderate	Housing	Single-Family Residence	No, Locally Significant	High	No	Yes	Yes
Village Residential Housing - High	High	Housing	Single-Family Residence	No, Locally Significant	High	No	Yes	Yes
Village Residential Housing - Extreme	Extreme	Housing	Single-Family Residence	No, Locally Significant	High	Yes	Yes	Yes
West Babylon Residential Housing - Moderate	Moderate	Housing	Single-Family Residence	No, Locally Significant	High	No	Yes	Yes
Neguntatogue Creek	Extreme	Natural and Cultural Resources	Water Bodies	No, Locally Significant	Med	Yes	No	No
Sampawams Creek	Extreme	Natural and Cultural Resources	Water Bodies	No, Locally Significant	Med	Yes	No	No
Santapogue Creek	Extreme	Natural and Cultural Resources	Water Bodies	No, Locally Significant	Med	Yes	No	No
Secondary Streets - Extreme Risk	Extreme	Infrastructure Systems	Transportation	No, Locally Significant	Med	Yes	Yes	Yes
First Presbyterian Church	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	No, Locally Significant	Low	No	Yes	No
Babylon Junior-Senior High School	Moderate	Health and Social Services	Schools	No, Locally Significant	Med	No	Yes	No
St. Joseph's Roman Catholic Church	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	No, Locally Significant	Low	No	Yes	No
Babylon Village Commercial District	High	Economic	Downtown Center	No, Locally Significant	Med	No	Yes	Yes

**\* The following Asset Attribute and five Landscape Attributes have the same value (“Yes”) for every asset, and are therefore not included in Table 24:**

- Socially Vulnerable Populations (“Yes”);
- Erosion Rate: Long-term average 1 foot or more/year, or unknown (“No”);
- Shore Defenses: absent, not constructed to anticipated storm or sea level rise conditions, or deteriorating (“Yes”); and
- Dunes or Bluffs: Dunes absent, below BFE, or eroding (scarped), discontinuous, or have little vegetation. Bluff slope is unstable, partially vegetated (“Yes”)



# Village of Babylon/West Babylon NY Rising Community Reconstruction Plan

Table 25: Risk Assessment

Asset Information (see note) *						Landscape Attributes (see note) *				Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Critical Facility	Community Value	Waterline frequently at shore defense or upland vegetation	Protective vegetation between asset & flood source absent	Asset on coastal barrier island or filled wetland	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Waterfront Commercial	Extreme	Economic	Marina/ Water Based Business	No, Locally Significant	Med	Yes	Yes	Yes	2.5	3	4.50	3	41
Babylon Village Dock	Extreme	Economic	Marina/ Water Based Business	No, Locally Significant	Low	Yes	Yes	Yes	2.5	3	4.50	2	27
Babylon Beach House - Home for Adults	Extreme	Housing	Senior Housing	Yes, FEMA	High	Yes	Yes	Yes	2.5	3	4.50	4	54
Venetian Yacht Club	Extreme	Economic	Marina/ Water Based Business	No, Locally Significant	Med	Yes	Yes	Yes	2.5	3	4.50	2	27
Babylon Village Pool	Extreme	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Med	Yes	Yes	Yes	2.5	3	4.50	2	27
Venetian Shores Park	Extreme	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Med	Yes	Yes	Yes	2.5	3	4.50	3	41
Marina - Venetian Shores	Extreme	Economic	Marina/ Water Based Business	No, Locally Significant	Low	Yes	Yes	Yes	2.5	3	4.50	2	27
Bergen Point Golf Course & Harbor Club	Extreme	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Med	Yes	Yes	Yes	2.5	3	4.50	2	27
Marina - 104 boats	Extreme	Economic	Marina/ Water Based Business	No, Locally Significant	Low	Yes	Yes	Yes	2.5	3	4.50	2	27
Great South Bay Shopping Center	Extreme	Economic	Large Business	No, Locally Significant	Med	Yes	Yes	Yes	2.5	3	4.50	3	41
Microwave Tower, Venetian Shores Park	Extreme	Infrastructure Systems	Tele-communications	No, Locally Significant	Med	Yes	Yes	Yes	2.5	3	4.50	3	41
West Babylon Residential Housing - Extreme Risk	Extreme	Housing	Single-Family Residence	No, Locally Significant	High	Yes	Yes	Yes	2.5	3	4.50	4	54
Fred Shore Beach Club	Extreme	Natural and Cultural Resources	Community Centers	No, Locally Significant	Low	Yes	Yes	Yes	2.5	3	4.50	4	54
West Babylon Residential Housing - High Risk	High	Housing	Single-Family Residence	No, Locally Significant	High	No	Yes	Yes	2	3	3.00	3	27



# Village of Babylon/West Babylon NY Rising Community Reconstruction Plan

Table 25 (cont'd)

Asset Information (see note) *						Landscape Attributes (see note) *				Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Critical Facility	Community Value	Waterline frequently at shore defense or upland vegetation	Protective vegetation between asset & flood source absent	Asset on coastal barrier island or filled wetland	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Suffolk County Sewer District - Radioactive Materials	Moderate	Infrastructure Systems	Waste-water	Yes, FEMA	Med	No	Yes	Yes	2	3	2.50	3	23
Sunrise Senior Living	Moderate	Housing	Senior Housing	Yes, FEMA	High	No	Yes	Yes	2	3	2.50	3	23
West Babylon Fire Department - Station 3	Moderate	Health and Social Services	Emergency Operations /Response	Yes, FEMA	High	No	Yes	No	1.5	3	2.00	2	12
Options for Community Living Residential Home	Moderate	Housing	Senior Housing	Yes, FEMA	High	No	Yes	No	1.5	3	2.00	3	18
Babylon Child Care Center	Moderate	Health and Social Services	Daycare and Eldercare	No, Locally Significant	High	No	Yes	No	1.5	3	2.00	3	18
Working Org of Retarded Children & Adults	Moderate	Housing	Supportive Housing	Yes, FEMA	High	No	Yes	No	1.5	3	2.00	3	18
Nuclear Cardiology - Radioactive Material	Moderate	Health and Social Services	Healthcare Facilities	Yes, FEMA	High	No	Yes	Yes	2	3	2.50	3	23
Ambulance - EMT	Moderate	Health and Social Services	Emergency Operations /Response	Yes, FEMA	High	No	Yes	No	1.5	3	2.00	3	18
Babylon Fire Station: Headquarters/ Village Hall/DPW	Moderate	Health and Social Services	Emergency Operations /Response	Yes, FEMA	High	No	Yes	No	1.5	3	2.00	2	12
Babylon Fire Dept - Argyle Hose Company	Moderate	Health and Social Services	Emergency Operations /Response	Yes, FEMA	High	No	Yes	No	1.5	3	2.00	2	12
St. Joseph Nursery School	Moderate	Health and Social Services	Daycare and Eldercare	No, Locally Significant	High	No	Yes	No	1.5	3	2.00	3	18
Babylon Fire Dept - Cedar St Station	Moderate	Health and Social Services	Emergency Operations /Response	Yes, FEMA	High	No	Yes	No	1.5	3	2.00	2	12
Nuclear Cardiology - Radioactive Material	Moderate	Health and Social Services	Healthcare Facilities	Yes, FEMA	High	No	Yes	No	1.5	3	2.00	3	18
Bayview Rest Home - Adults (Assisted Living)	Moderate	Housing	Senior Housing	Yes, FEMA	High	No	Yes	No	1.5	3	2.00	3	18
American Legion Hall	Moderate	Natural and Cultural Resources	Community Centers	Yes, FEMA	Low	No	Yes	No	1.5	3	2.00	3	18



# Village of Babylon/West Babylon NY Rising Community Reconstruction Plan

Table 25 (cont'd)

Asset Information (see note) *						Landscape Attributes (see note) *				Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Critical Facility	Community Value	Waterline frequently at shore defense or upland vegetation	Protective vegetation between asset & flood source absent	Asset on coastal barrier island or filled wetland	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
LIPA Substation	Moderate	Natural and Cultural Resources	Transportation	Yes, FEMA	Med	No	Yes	No	1.5	3	2.00	3	18
United Methodist Nursery School	Moderate	Health and Social Services	Daycare and Eldercare	No, Locally Significant	High	No	Yes	No	1.5	3	2.00	3	18
East Neck Nursing & Rehab Center	Moderate	Housing	Senior Housing	Yes, FEMA	High	No	Yes	No	1.5	3	2.00	3	18
Bergen Point Sewage Treatment Plant	Moderate	Infrastructure Systems	Waste-water	Yes, FEMA	High	No	Yes	Yes	2	3	2.50	2	15
SCWA Treatment Plant and Wells	Moderate	Infrastructure Systems	Water Supply	Yes, FEMA	High	No	Yes	No	1.5	3	2.00	2	12
LIPA Substation & Power Generation Facility	Moderate	Infrastructure Systems	Power Supply	Yes, FEMA	High	No	Yes	No	1.5	3	2.00	3	18
SCWA - Water Tank and Wells	Moderate	Infrastructure Systems	Water Supply	Yes, FEMA	High	No	Yes	No	1.5	3	2.00	2	12
State Hwy 27	High	Infrastructure Systems	Transportation	No, Locally Significant	High	No	Yes	No	1.5	3	2.50	1	8
Argyle Lake Park	Extreme	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Med	Yes	Yes	No	2	3	4.00	2	24
Belmont Lake State Park	High	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Med	Yes	No	No	1.5	3	2.50	1	8
Bergen Point County Park	Extreme	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Med	Yes	No	Yes	2	3	4.00	2	24
Southards Pond Park	High	Natural and Cultural Resources	Parks and Recreation	No, Locally Significant	Med	Yes	No	No	1.5	3	2.50	1	8
Village Residential Housing - Moderate Risk	Moderate	Housing	Single-Family Residence	No, Locally Significant	High	No	Yes	Yes	2	3	2.50	4	30
Village Residential Housing - High	High	Housing	Single-Family Residence	No, Locally Significant	High	No	Yes	Yes	2	3	3.00	4	36
Village Residential Housing - Extreme	Extreme	Housing	Single-Family Residence	No, Locally Significant	High	Yes	Yes	Yes	2.5	3	4.50	4	54
W Babylon Residential Housing -	Moderate	Housing	Single-Family Residence	No, Locally Significant	High	No	Yes	Yes	2	3	2.50	3	23



Table 25 (cont'd)

Asset Information (see note) *						Landscape Attributes (see note) *				Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Critical Facility	Community Value	Waterline frequently at shore defense or upland vegetation	Protective vegetation between asset & flood source absent	Asset on coastal barrier island or filled wetland	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Neguntatogue Creek	Extreme	Natural and Cultural Resources	Water Bodies	No, Locally Significant	Med	Yes	No	No	1.5	3	3.50	1	11
Sampawams Creek	Extreme	Natural and Cultural Resources	Water Bodies	No, Locally Significant	Med	Yes	No	No	1.5	3	3.50	1	11
Santapogue Creek	Extreme	Natural and Cultural Resources	Water Bodies	No, Locally Significant	Med	Yes	No	No	1.5	3	3.50	1	11
Secondary Streets - Extreme Risk	Extreme	Infrastructure Systems	Transportation	No, Locally Significant	Med	Yes	Yes	Yes	2.5	3	4.50	3	41
First Presbyterian Church	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	No, Locally Significant	Low	No	Yes	No	1.5	3	2.00	3	18
Babylon Junior-Senior High School	Moderate	Health and Social Services	Schools	No, Locally Significant	Med	No	Yes	No	1.5	3	2.00	3	18
St. Joseph's Roman Catholic Church	Moderate	Natural and Cultural Resources	Cultural or Religious Establishments	No, Locally Significant	Low	No	Yes	No	1.5	3	2.00	3	18
Babylon Village Commercial District	High	Economic	Downtown Center	No, Locally Significant	Med	No	Yes	Yes	2	3	3.00	3	27

**\* The following Asset Attribute and three Landscape Attributes have the same value for every asset, and are therefore not included in Table 25:**

- Socially Vulnerable Populations (“Yes”);
- Erosion Rate ≥1 foot per year or unknown (“No”);
- Shore defenses absent, not constructed to anticipated conditions, or deteriorating (“Yes”); and
- Dunes absent, below BFE, eroding, little vegetation; Bluff slope unstable, little vegetation (“Yes”)



## E. GLOSSARY

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### Acronyms

- AARP - American Association of Retired Persons
- ACS - American Community Survey
- ADA - Americans with Disabilities Act
- CBA - Cost-benefit analysis
- CBD - Central Business District
- CDBG-DR - Community Development Block Grant – Disaster Recovery
- CDP - Census Designated Place
- CeHa - Coastal Erosion Hazard Area
- CERT - Communication Emergency Response Team
- DPW - Department of Public Works
- EMS - Emergency Medical Services
- FEMA - Federal Emergency Management Agency
- FTE - Full-time equivalent
- GIS - Geographic Information Systems
- HUD - U.S. Department of Housing and Urban Development
- LIRR - Long Island Rail Road
- NOAA - National Oceanic and Atmospheric Administration
- 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

RSF - Recovery Support Function

SBA - Small Business Administration

USACE - U.S. Army Corps of Engineers

VFW - Veterans of Foreign Wars

### Terms

**Asset** - Places or entities where economic, environmental and social functions of the community occur.

**Asset Inventory** - Completing an inventory of the community's social, economic, and natural resource assets that have been, or will be, affected by coastal or riverine hazards.

**Community Vision** - The overall goal of the community throughout the NYRCR planning process.

**Conceptual Plan** - A snapshot of the current thoughts of the community and planning committee. The plans will evolve as communities analyze the risk to their assets, their needs and opportunities, the potential costs and benefits of projects and actions, and their priorities.

**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.

**Implementation Schedule** - Preparing an implementation schedule of the actions needed to implement the strategies.

**Lidar** - A remote sensing technology that measures distance by illuminating a target with a laser and analyzing the reflected light.

**Need** - Infrastructure and 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** - Additional 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.

**Public Engagement** - Offering opportunities for public input and involvement at key milestones in the planning process.

**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.

**Strategies for Investment and Action** - Developing strategies and the projects and actions needed to implement the strategies; identifying potential costs and benefits of chosen projects and actions, as well as potential funding sources.

**Vulnerability** - The capacity of an asset to return to service after an event.



### F. END NOTES

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<sup>1</sup> All photos in this document are provided courtesy of the NYRCR Consultant Team, unless otherwise noted.

<sup>2</sup> U.S. Census Bureau. Census 2010, Table DP-1

<sup>3</sup> With the exception of data on ethnicity and race, all demographic data depicted below is taken from the Census' American Factfinder at the CDP level, and reflects data from the most recent American Community Survey (ACS). Demographic data relating to ethnicity and race were derived from the 2010 Census in order to provide the most recent data available in those categories.

<sup>4</sup> U.S. Census Bureau. American Community Survey estimates (2005-2009)

<sup>5</sup> U.S. Census Bureau. American Community Survey estimates (2005-2009)

<sup>6</sup> U.S. Census Bureau. American Community Survey estimates (2005-2009)

<sup>7</sup> U.S. Census Bureau. American Community Survey estimates (2005-2009)

<sup>8</sup> U.S. Census Bureau. American Community Survey estimates (2005-2009)

<sup>9</sup> U.S. Census Bureau. American Community Survey estimates (2005-2009)

<sup>10</sup> Seven vacancy categories in the 2010 US Census: for rent, rented but not yet occupied, for sale only, sold but not yet occupied, seasonal or recreational or occasional use, for migrant workers, and vacant for some other reason

<sup>11</sup> U.S. Census Bureau. American Community Survey estimates (2005-2009)

<sup>12</sup> Monitoring storm tide and flooding from Hurricane Sandy along the Atlantic coast of the United States, U.S. Geological Survey, October 2012

<sup>13</sup> 2014 New York City Hazard Mitigation Plan, P. 250, January 2014.

<sup>14</sup> Analysis of Communities Impacted by Hurricane Sandy. The U.S. Department of Housing and Urban Development (HUD), Office of Policy Development and Research, January 2013 (draft).

<sup>15</sup> <http://regionalcouncils.ny.gov/themes/nyopenrc/rc-files/longisland/LI-2013-pr.pdf>

<sup>16</sup> Responding to Climate Change in New York State: The Climaid Integrated Assessment for Effective Climate Change Adaptation in New York State: Final Report. New York State Energy Research and Development Authority (NYSERDA). November 2011.

<sup>17</sup> Suffolk County Comprehensive Water Resources Management Plan: Executive Summary, County of Suffolk, Page 1. January 2014.

<sup>18</sup> Fire Island Inlet to Montauk Point (FIMP) Reformulation Study, U.S. Army Corps of Engineers, Page 3. May 2009.

<sup>19</sup> [nan.usace.army.mil/Missions/CivilWorks/ProjectsInNewYork/FireIslandtoMontaukPointReformulationStudy.aspx](http://nan.usace.army.mil/Missions/CivilWorks/ProjectsInNewYork/FireIslandtoMontaukPointReformulationStudy.aspx)



**NY Rising Community Reconstruction Program**  
**[www.stormrecovery.ny.gov/nyrcr](http://www.stormrecovery.ny.gov/nyrcr)**