

P1

Stormwater Drainage Repair

Clear debris and repair the stormwater system

Cost Estimate: \$4,310,000



Key Facts

- Project Type: Protective Measures
- Recovery Function: Infrastructure
- Project Location/Municipality: Bellmore and Merrick
- Primary Target Area Affected: Drainage systems south of Merrick Road
- Consistency with NYRCR: Address short, medium, and long-term risks
- Potential Beneficiaries: Bellmore and Merrick residents and businesses south of Merrick Road

Project Information

Many areas in Merrick and Bellmore experienced flooding during Superstorm Sandy, particularly south of Merrick Road. Flood waters not only rose over bulkheads and into neighborhoods, but also traveled up through stormwater drains, bringing in sediment and debris from the bay. During Hurricane Irene and Lee the source of flooding was rainfall, which overwhelmed the system's capacity.

This project would inspect the drainage system, specifically in areas that flooded during Sandy or Irene, or that are subject to routine tidal flooding. Following inspection, the drainage infrastructure will be cleaned out, repaired, or replaced. These improvements will allow the drainage to function more optimally and will help to minimize street flooding due to rain and high tides. Following a storm event, roads may drain more quickly, allowing first responders, local residents and business owners quicker access to their destinations.



Extra debris collected in drainage system after Superstorm Sandy



P2

Outfall Assessment and Tidal Check Valve Installation

Inspect outfalls along the coastline of Bellmore and Merrick and install tidal check valves where appropriate

Cost Estimate: \$750,000



Key Facts

- Project Type: Water Control Facilities
- Recovery Function: Infrastructure
- Project Location/Municipality: Bellmore-Merrick shoreline within 1,200 feet of estuary
- Primary Target Area Affected: South Bellmore and Merrick
- Consistency with NYRCR: Address short, medium, and long-term risks
- Potential Beneficiaries: Bellmore and Merrick residents and businesses

Project Information

There are about 230 outfalls along the coast of Bellmore and Merrick that discharge collected in storm drains from roofs and streets. Open or damaged outfalls allow a path for floodwaters to back up into the drainage system and flood roadways upstream of the outfall. While the cause of tidal flooding in Bellmore and Merrick is due to a number of factors, tidal check valves can be effective when flooding is caused by water entering the system through outfalls along the shoreline.

This project includes the inspection of outfalls along the coastline of Bellmore and Merrick to determine the condition and appropriateness of installation of tidal check valves.

After inspection, 25 tidal check valves will be installed, of either the inline pipe tight or slip-on duckbill type, on outfalls where they would be most effective in addressing flooding. Records of assessment and installation will be provided in Geographic Information Systems software for ongoing asset management.



High tides can cause flooding in low-lying streets when seawater backs up into storm sewers



A check valve allows stormwater to flow out, but prevents tide water from flowing into storm sewers

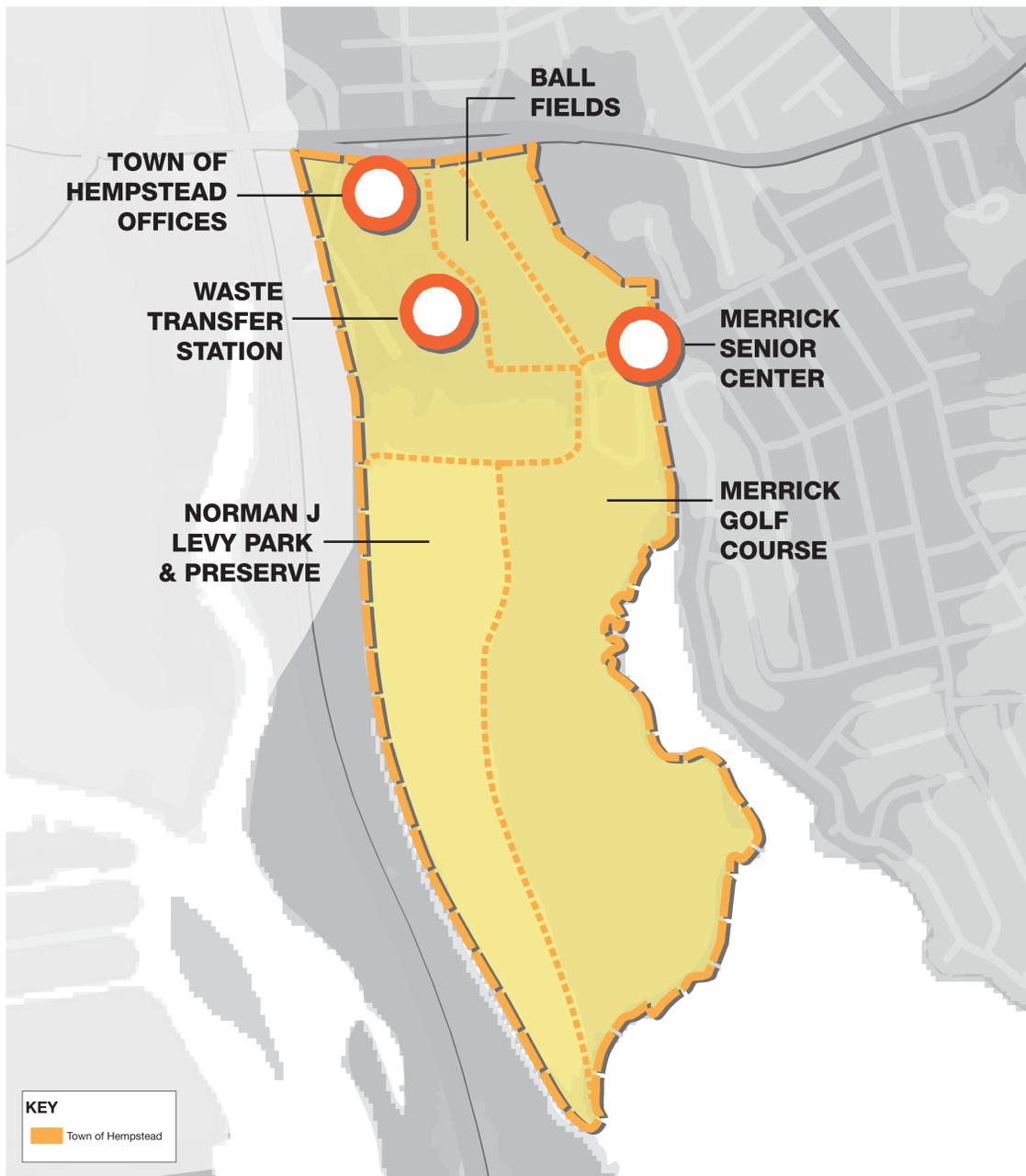


P3

Southwest Merrick Masterplan

Create a Masterplan to re-envision Town-owned parcels as resilient community facilities and open space that also prevent flooding

Cost Estimate: \$250,000



Key Facts

- Project Type: Planning and Additional Study
- Recovery Function: Natural and Cultural Resources
- Project Location/Municipality: Merrick Road, Clubhouse Road (includes current Waste Transfer Station, TOH offices, Merrick Senior Center, Ball fields, Golf Course, and Levy Preserve)
- Primary Target Area Affected: Southwest Merrick
- Consistency with NYRCR: Drive economic growth
- Potential Beneficiaries: Bellmore and Merrick Residents

Project Information

The collection of parcels owned by the Town of Hempstead near Merrick and Clubhouse Roads were significantly impacted by Superstorm Sandy. The Town of Hempstead Dept of Sanitation Waste Transfer Station was flooded, causing trash to enter the waterways. The Norman Levy Preserve wetlands provided protection from the storm surge but were damaged in the process. Merrick Road, an emergency evacuation route, was severely flooded.

This project includes the creation of a Masterplan to re-envision the combined parcels. Concepts may include:

- Ideas for new buildings and amenities to address community needs.
- Reconfigure site to make more resilient and to reduce flooding to Merrick Road during storm events.
- “Green infrastructure” measures, such as a catchment basin within the site to store water when needed.
- Enhancements to wetlands or other natural barriers within Norman Levy Preserve.
- Improved open space and recreational opportunities.
- Explore potential to create a microgrid using alternative energy like solar and wind.



Bridgeport Park is an example of a comprehensive masterplan



Green Infrastructure measures capture and naturally treat stormwater runoff



P4

Bellmore-Merrick Community Resource Centers

Create network of Community Resource Centers and complementary public education program

Cost Estimate: \$3,000,000



Key Facts

- Project Type: Public Buildings
- Recovery Function: Community Planning and Capacity Building
- Project Location/Municipality: Possible locations include the Merrick Library, Bellmore Library, Newbridge Park, Bellmore Senior Center and Merrick Senior Center
- Primary Target Area Affected: Bellmore and Merrick
- Consistency with NYRCR: Increase resiliency of key assets
- Potential Beneficiaries: Bellmore and Merrick residents

Project Information

Following Superstorm Sandy, Bellmore and Merrick residents were without power for extended periods, making it difficult to access the internet, make phone calls, communicate about distributing aid and gather with their neighbors for support. Community Resource Centers (CRCs) are places for residents to obtain information about emergency preparedness under normal conditions. During and after a storm, these centers would become a place to gather, collect and distribute resources (emergency supplies – deployable showers, non-perishable food, potable water/iodine tablets, blankets and tarps, emergency evacuation instructions, bicycles, toiletries, winter clothing, OTC medications, first aid, hand tools), charge cell phones, access the internet. Possible CRCs include Bellmore Library, Merrick Library, Bellmore Senior Center, Merrick Senior Center, and Newbridge Park.

This project would include the employment of a Local Disaster Recovery Manager who would provide emergency preparedness education to residents and businesses and coordinate the addition of resiliency measures at CRCs. Natural gas generators would be installed at each of the CRCs to ensure power during a storm event.



Bellmore Library could be used as a Community Resource Center



Community Resource Centers can collect and distribute emergency supplies to displaced residents



P5

Priority Road Streetlight Retrofit

Install LED streetlights with solar PV and battery backup on existing utility poles

Cost Estimate: \$2,500,000



Key Facts

- Project Type: Roads and Bridges
- Recovery Function: Infrastructure
- Project Location/Municipality: Priority roads in Bellmore and Merrick
- Primary Target Area Affected: Bellmore and Merrick
- Consistency with NYRCR: Increase resiliency of key assets
- Potential Beneficiaries: Bellmore and Merrick residents, businesses and first responders

Project Information

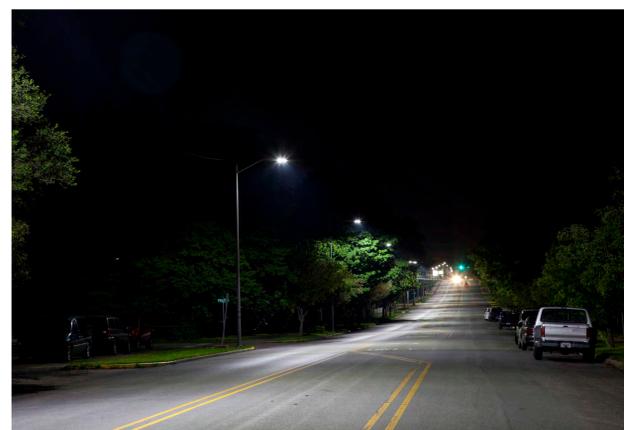
Lack of light on streets following Superstorm Sandy was reported to be a safety hazard by community members and negatively impacted first responders.

This project includes installation of LED street lights with photovoltaics and battery backup on existing utility poles. Installation would be prioritized based on emergency access needs and could include future “Lifeline Network” roads.

If future undergrounding of utility lines occurs and new separate street lights are installed, the LED/PV street lights could be used in other parts of the community.



Solar PV street lights incorporate batteries to store power generated during the day for use at night



LED street lights use less energy and require less maintenance than traditional lamps





Integrated Communication Network

A regionally-coordinated, one stop shop for disaster and emergency information, communication and training

Cost Estimate: (Phase 1) \$20,000 - \$100,000 per CR Area

Project Information

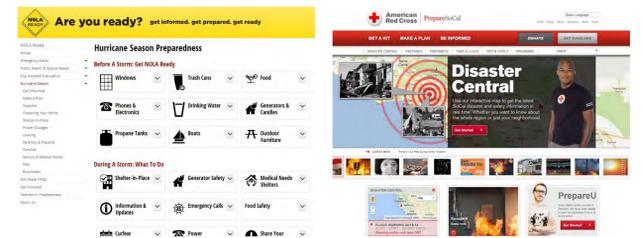
Create a single source for comprehensive information and emergency assistance and establish a communication network that more effectively links the local government with emergency management agencies, faith-based groups, and non-profit organizations to direct aid and recovery efforts to the community's socially vulnerable populations.

Benefits: Phase 1 of this project would evaluate existing emergency communication systems and determine additional needs, with an emphasis on coordination across multiple jurisdictions. Phase 2 would establish a centralized location (such as a website) with consistent "branding" to make disaster information identifiable, and regular updates to keep information current. Phase 3 would include the creation of an educational component, using the website to promote educational seminars on disaster planning. Both Phase 2 and 3 have the potential for private and nonprofit sponsorships and partnerships.

Relationship to Disasters: During and after Superstorm Sandy many residents did not know where to look for emergency information. Some community members did not understand the severity of the storm and were unable to evacuate after conditions became unsafe, putting themselves and emergency responders at risk. Following the storm, power outages and lack of cellphone service left residents unable to communicate with friends and family members, and without a means to find emergency resource information.

Key Facts

- Project Type: Emergency Readiness
- Recovery Function: Community Planning and Capacity Building
- Project Location/Municipality: Nassau County
- Primary Target Area Affected: Nassau County
- Consistency with NYRCR: Coordinate with regional initiatives
- Potential Beneficiaries: All Nassau County residents impacted by future disasters



Business Continuity Program

Establish a business continuity program to ensure that businesses can maintain essential functions during and after emergency events

Cost Estimate: \$35,000 - \$40,000 per CR Area

Project Information

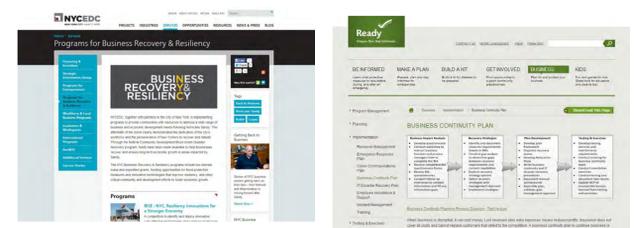
Business continuity planning ensures that businesses have the capability to maintain essential functions during a range of potential emergencies. The assistance provided by a Business Continuity Program would include planning assistance, access to alternative spaces or facilities, communications provisions, and provisions for vital records backup and management.

Benefits: The Business Continuity Program would help small businesses to create their own plans for continuing operations under adverse conditions, such as a major storm. The program would work with Adelphi University and the Business Continuity Institute to lead training sessions for local business owners. Training sessions will include assisting business owners to create a database to store, update and/or view temporary emergency power requirements for their establishments. This data will help owners procure emergency power generation supplies before a disaster, and prioritize temporary power requirements.

Relationship to Disasters: After Superstorm Sandy some 105 Bellmore and Merrick business, representing 314 employees applied for disaster management assistance after Hurricane Sandy. These applications verified a total of \$7.5 million in real property damage, \$1.2 million of machinery damage, an inventory loss of \$409,722 and a leaseholder improvement loss of \$554,485. Of these applications, only 37 (35.2%) were approved for an amount totaling just over \$7.1 million, roughly three quarters of the \$9.6 million in verified damage assistance applied for.

Key Facts

- Project Type: Emergency Readiness
- Recovery Function: Economic, Community Planning and Capacity Building
- Project Location/Municipality: Nassau County
- Primary Target Area Affected: Nassau County
- Consistency with NYRCR: Drive economic growth
- Potential Beneficiaries: Nassau County businesses impacted by future disasters





South Shore Stormwater System Modeling and Analysis

Evaluate condition and ownership of stormwater drainage systems and identify solutions for stormwater management

Cost Estimate: \$500,000 - \$600,000 per CR Area

Project Information

This project would document the condition and ownership of stormwater drainage systems in the region, and use hydraulic and hydrologic modeling to study surface and subsurface stormwater drainage patterns. A study of the Sunrise Highway Conduit would also be performed to address drainage issues in upland areas.

Benefits: Modeling and analysis is necessary to help identify and prioritize solutions for stormwater management. This includes capital projects, updated maintenance requirements, regulatory improvements, public awareness programs, and other property-owner assistance measures. These initiatives would increase the capacity of the stormwater system and reduce flooding issues in the region.

Relationship to Disasters: Rain and storm surge during Sandy overwhelmed the stormwater drainage system and exacerbated flooding. Additionally, localized flooding is frequently observed during heavy rainfall or high tides.

Key Facts

- Project Type: Planning and Additional Study
- Recovery Function: Infrastructure
- Project Location/Municipality: Nassau County
- Primary Target Area Affected: Nassau County
- Consistency with NYRCR: Increase resiliency of key assets
- Potential Beneficiaries: Nassau County residents and businesses



South Shore Shoreline Conditions Analysis and Restoration Program

Analyze shoreline conditions and incentivize coordinated improvements to reduce erosion and mitigate flooding

Cost Estimate: \$100,000 - \$200,000 per CR Area

Project Information

Develop a program to incentivize and provide support for coordinated and continuous shoreline improvements along private waterfront properties, including measures to reduce erosion and provide protection against tidal action and storm surge. This program would include the creation of a digital inventory to assess shoreline conditions, and analyze potential strategies to restore shorelines to pre-Irene and pre-Sandy conditions. Pilot projects should be implemented and monitored at a local level.

Benefits: Shoreline improvements such as hard or hybrid structures, living shorelines, wave attenuation measures such as oyster reefs, and other natural solutions can help mitigate shoreline erosion and protect coastal properties from flooding and degradation.

Relationship to Disasters: Irene and Sandy caused widespread damage to Long Island's southern coastline. Many protective coastal features were affected, compromising their ability to control erosion and flooding.

Key Facts

- Project Type: Protective Measures
- Recovery Function: Natural and Cultural Resources, Infrastructure
- Project Location/Municipality: Nassau County
- Primary Target Area Affected: Nassau County
- Consistency with NYRCR: Increase resiliency of key assets
- Potential Beneficiaries: Nassau County residents





Lifeline Transportation Network

Identify and establish a system of local roads that lead to evacuation routes and Community Resource Centers

Cost Estimate: \$100,000 - \$120,000 per CR Area

Project Information

Perform a study to identify a system of local roads that lead to Nassau County designated evacuation routes, Community Resource Centers, and evacuation centers. These “Lifeline Roads” should be prioritized for resilience and response measures such as debris cleaning, and clearly identified with uniform signage. Street lights and signals should be independently powered, and cell phone towers in proximity to the network should be required to maintain additional backup power resources.

Benefits: Establishing and publicizing a designated lifeline transportation network would ensure that residents and emergency responders can move throughout the community during and immediately after a major storm event.

Relationship to Disasters: Emergency responders had difficulty accessing heavily flooded areas during Sandy, and some residents who did not or were unable to evacuate before the storm made landfall were trapped in their homes. Even after the storm, debris on roadways made movement difficult.

Key Facts

- Project Type: Planning and Additional Study
- Recovery Function: Infrastructure
- Project Location/Municipality: Nassau County
- Primary Target Area Affected: Nassau County
- Consistency with NYRCR: Increase resiliency of key assets
- Potential Beneficiaries: Nassau County residents



Regional Energy Action Plan

Evaluate options for distributed generation, microgrid implementation and smart grid technology integration

Cost Estimate: (Initial study) \$1,000,000

Project Information

Perform a study to identify opportunities for distributed generation and microgrid deployment, and smart grid integration into the existing electricity distribution system. Potential projects should incorporate community-driven planning and design, and leverage public-private partnerships for funding resources.

Benefits: Distributed generation resources can lower energy costs, and combined with a microgrid system can enhance grid reliability for all electricity customers. Smart grid technology can help utilities identify and service faults and outages faster, and allows for more efficient and reliable operation. These technologies also create new opportunities for jobs in clean energy industries, and contribute to a cleaner environment.

Relationship to Disasters: During Sandy, Irene, and many other minor storms damage to overhead utility lines resulted in power outages, which lasted for days in some parts of the region.

Key Facts

- Project Type: Utilities
- Recovery Function: Infrastructure
- Project Location/Municipality: Nassau County
- Primary Target Area Affected: Nassau County
- Consistency with NYRCR: Coordinate with regional initiatives
- Potential Beneficiaries: Nassau County residents and businesses

