

# Freeport Channel Cable Crossing Improvements

Replace and extend the buried portion of critical distribution cables to protect power distribution from floating debris and prevent outages

Cost Estimate: \$3,000,000



## Key Facts

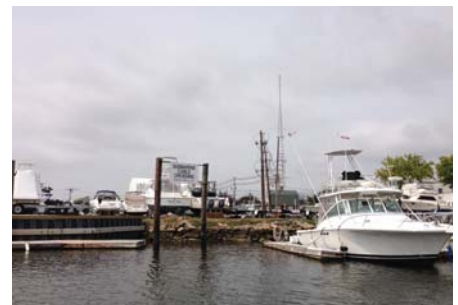
- Project Type: Utilities
- Recovery Function: Infrastructure
- Project Location/Municipality: Hanse Avenue, Ray Street, South Main Street, South End Place
- Primary Target Area Affected: Industrial Park, boat yards and southern residential streets in South Freeport
- Consistency with NYRCR: Increase resiliency of key assets
- Potential Beneficiaries: 25% of Freeport residents and businesses, two schools, two firehouses, two sewer pump stations, and three flood sirens and Nautical Mile hotels and restaurants.

## Project Information

The project would extend the buried portion of the cables beyond the boat yard to protect the lines from freed boats and debris during storm surges. These lines contained with these cables serve as a critical link between Substation 2P and 4F, which supply power to one quarter of Freeport. While the conduits containing the cables are being accessed, the conduits and cables will be replaced.

**Benefits:** The project will provide greater resilience for Freeport Electric's power supply and distribution network. As a result, residents and businesses will be provided with greater energy security. Critical community assets such as schools, firehouses, pump stations and flood sirens will have greater energy security. Emergency responders and technicians will be at lower risk of electrocution and electrical fires will be less likely in South Freeport.

**Relationship to Disasters:** As reported by Freeport Electric staff, marina operators, and CR committee members, boats and other floating debris were impacting elevated electric cables and their support structures. Tie lines were tripped and an overload of one of the lines and delayed system restoration following Superstorm Sandy.



The cable crossing is located adjacent to a marina



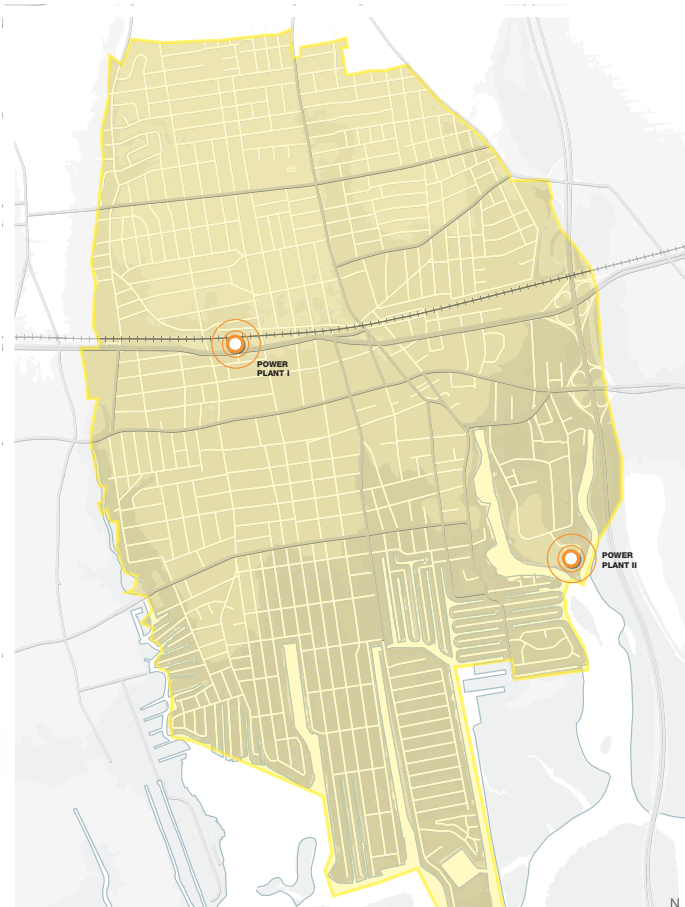
The cable crossing is a critical link between two of Freeport Electric's substations

# P2

# Outage Management System

Install a system upgrade to Freeport Electric's asset management system to enable safer and faster outage management

Cost Estimate: \$480,000



## Key Facts

- Project Type: Utilities
- Recovery Function: Infrastructure
- Project Location/Municipality: Freeport Village
- Primary Target Area Affected: Freeport Electric customers
- Consistency with NYRCR: Increase resiliency of key assets
- Potential Beneficiaries: Emergency responders and technicians will be protected from electrocution, all residents and businesses will benefit from fewer and shorter outages.

## Project Information

The Outage Management System would upgrade Freeport Electric's existing service by creating a web-based reporting and response system for outages or issues with essential services (power, water mains, gas).

The System would link directly to Freeport Electric's existing systems and enables asset protection before an event, incident mitigation during an event, and faster incident management and service restoration after an event.

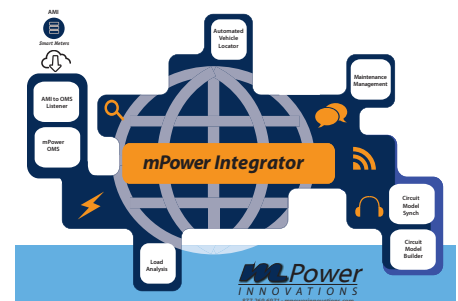
**Benefits:** This upgrade would allow for remote shut-off of buildings/portions of the grid to enable faster and safer repairs, while allowing for outages to be contained.

If this system had been available during Sandy, electrical fires may have been able to be avoided, blackouts could have been contained better and service could have been restored faster, it is also likely that public expenditures could have been reduced.

**Relationship to Disasters:** During Hurricane Lee and Superstorm Sandy, network outages occurred yet it was impossible to monitor from a central location forcing staff and emergency responders to conduct field verification. This put responders and technicians in unnecessarily risky situations and delayed system restoration.



Damaged utility lines must be located and repaired individually before power can be restored



Software such as mPower can be used by utilities to manage outages and monitor the grid



# Protection for Freeport Electric's Power Plant II

Design and test protection options for Freeport Electric's Power Plant II

Cost Estimate: \$1,350,000



## Key Facts

- Project Type: Utilities
- Recovery Function: Infrastructure
- Project Location/Municipality: Freeport Industrial Park
- Primary Target Area Affected: Freeport Village
- Consistency with NYRCR: Address short, medium, and long-term risks
- Potential Beneficiaries: Freeport residents and businesses

## Project Information

This project would seek to study protection options (for either critical assets or the entire site), design flood protection, and identify further funding from NYS and US grant programs to implement and construct the design.

A National Fish and Wildlife Foundation (NFWF) grant is currently being sought to restore the coastline and provide a layer of natural protection around Power Plant II. Further analysis will be done to ensure the designed flood protection does not negatively impact the natural system protection, should the NFWF grant be secured.

**Benefits:** This project would reduce risks to key Freeport Electric power generation assets. If the New York State and Long Island power grids go down during a disaster, the Plant would be the main source of power generation. Freeport and regional residents would be protected from a potential floating hazard, and the bays, marshes, wetlands and wildlife would be protected from contamination.

**Relationship to Disasters:** Power Plant II is highly vulnerable to coastal surges. Though no major damages were sustained during Sandy and Irene, Power Plant II is vulnerable to coastal surges. During Sandy, floodwaters reached the control center door and fuel tanks were shifted by the large volume of water. A larger storm could destroy all power generation equipment at the Plant and tear fuel storage tanks from their foundations, contaminating waterways and creating floating hazards in the process.



Freeport's Power Plant II is vulnerable to damage from future storm events



Natural protection can help reduce storm damage by attenuating floodwater and storm surge



Provide funding for the development of a microgrid in Downtown Freeport

Cost Estimate: \$750,000



## Key Facts

- Project Type: Utilities
- Recovery Function: Infrastructure
- Project Location/Municipality: Village of Freeport
- Primary Target Area Affected: Downtown Freeport
- Consistency with NYRCR: Increase resiliency of key assets
- Potential Beneficiaries: Downtown Freeport businesses and residents, all Freeport businesses and residents, Freeport Electric, LIRR, Verizon, potentially neighboring communities

## Project Information

A microgrid is a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid and that connects and disconnects from such grid to enable it to operate in both grid-connected or island mode.

**Benefits:** The microgrid in Downtown Freeport will provide energy security to essential services through disaster scenarios, improve energy diversity and increase capacity for TOD redevelopment (to enable relocation of residents and businesses from vulnerable areas). In addition it will create a more reliable and sustainable energy supply for Freeport.

This project seeks to identify funding and financing methods for the development of the microgrid, including State and Federal grant programs, capital budgeting and contributions from benefitting private entities. In addition, it will explore preliminary engineering feasibility concepts for the development of the microgrid, examine costs and identify necessary construction.

**Relationship to Disasters:** During Sandy, heavy winds and flooding caused damage to Freeport's overhead electricity lines, resulting in outages lasting multiple days. Critical facilities that lacked, or did not have sufficient backup power were adversely affected.



A microgrid will provide for community resource centers such as the Freeport Library (above) in a time of crisis



An independent power source would provide for emergency services clustered in Freeport's downtown







# Public Bulkhead Repair

Provide funding for the repair of bulkheads at  
Waterfront Park, Fairview Park and Hampton Place

Cost Estimate: \$950,000



## Key Facts

- Project Type: Protective Measures
- Recovery Function: Infrastructure
- Project Location/Municipality: Waterfront Park, Fairview Park and Hampton Place
- Primary Target Area Affected: Coastal areas
- Consistency with NYRCR: Protect vulnerable populations
- Potential Beneficiaries: Coastal populations, Freeport residents and visitors to recreational areas

## Project Information

Freeport received funding through the Regional Economic Development Council to replace 1,065 linear feet of bulkhead at Waterfront Park, however the funding falls significantly short of the amount required. This project seeks to fund the remainder of that project. It also seeks to reconstruct 200 linear feet of damaged bulkhead at Fairview Park and 75 linear feet of damaged bulkhead at Hampton Place.

Bulkheads will be replaced at an appropriate height and with modern materials that are more resilient to erosion and wind.

**Benefits:** The reconstruction of the bulkheads will sure up coastal protection in public areas, helping to maintain Freeport's open space and recreational areas. In addition, the bulkheads can help reduce flooding onto local streets, helping to maintain access during and after flood events.

**Relationship to Disasters:** Bulkheads in these areas, owned by the Village, were damaged during Hurricane Sandy. According to Freeport's Hazard Mitigation Plan: Another source of flooding is the system of existing bulkheads that already are or are becoming nonfunctional. Bulkheads have a maximum lifespan, and many in Freeport have exceeded that point. Some older bulkheads are too low, allowing water to pass over them, causing significant flooding to adjoining properties. Many low-lying bulkheads are not being raised to current code requirements since they are not being replaced. (sic)



Bulkheads should be replaced to meet height standards and incorporate modern, more resilient materials



Aging and nonfunctional bulkheads can cause flooding and erosion in waterfront properties



# Backup Power for Sewer Lift Stations

Provide backup natural gas generators for three Village sewer lift stations located in a Special Flood Hazard Area (SFHA)

Cost Estimate: \$150,000



## Key Facts

- Project Type: Emergency Readiness
- Recovery Function: Infrastructure
- Project Location/Municipality: Howard Street, Bayview Avenue, Suffolk Street
- Primary Target Area Affected: South Freeport
- Consistency with NYRCR: Increase resiliency of key assets
- Potential Beneficiaries: Freeport Residents

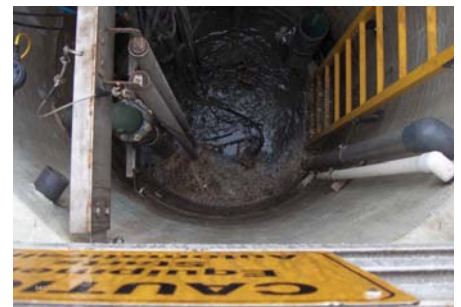
## Project Information

This project seeks to install permanent backup natural gas generators at each of the three sewer lift stations.

This complements the mitigation efforts by the Village of Freeport which involves replacing and raising motors, compressors and electrical panels, bricking over the windows and installing dam doors.

**Benefits:** While the Village's improvements certainly increase resilience alone, if the power distribution system is disrupted, the sewage system will be unable to operate and could cause an overflow. Backup power helps ensure that this does not happen in future storms.

**Relationship to Disasters:** All three pump stations were damaged by Superstorm Sandy. All of the electrical panels, pumps and compressors were submerged and destroyed. Village of Freeport Department of Works recommends the installation of backup generators as a redundancy element.



Lift stations pump wastewater uphill from low-lying areas to the sewer system where it can flow by gravity



Permanent backup generators installed at lift stations can prevent sewage backup during storm events

# Lifeline Road Networks Phase 1: Street Light Retrofit

Design and test protection options for  
Freeport Electric's Power Plant II

Cost Estimate: \$4,100,000



## Key Facts

- Project Type: Emergency Readiness
- Recovery Function: Infrastructure
- Project Location/Municipality: Guy Lombardo Ave, S Bayview Ave, S Long Beach Ave, S Main St, S Brookside Ave, N Main St, Merrick Rd, Sunrise Hwy
- Primary Target Area Affected: Freeport Village
- Consistency with NYRCR: Coordinate with regional initiatives
- Potential Beneficiaries: Freeport residents and businesses

## Project Information

The Lifeline Networks seek to serve as these routes through a suite of incremental improvements.

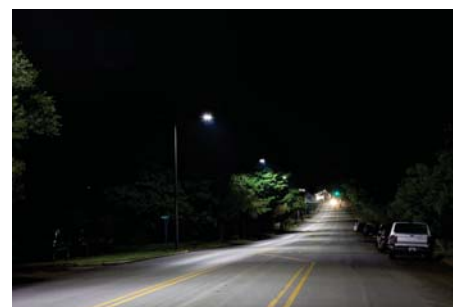
This first phase seeks to provide solar powered lighting with backup power, to ensure these roads always stay lit in the event of a power outage and resident can follow these lit streets toward safer areas and critical resources.

**Benefits:** Lifeline Road Network lighting would secure local access routes to evacuation routes, critical facilities and Community Resource Centers (see P-6: Community Resource Centers). They would also reduce the cost of power supply to the existing streetlight network.

**Relationship to Disasters:** NYRCR Freeport Committee Co-chairs, members of the public, and the Village of Freeport reported that there was a lack of clarity on which routes to use and which streets would provide access to evacuation routes, critical facilities, relief services and information centers during and after Sandy and other recent storms.



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



# Lifeline Road Networks

## Phase 2: Lifeline Signage

Design and install Lifeline signage along key local routes to provide orientation and destination signage

Cost Estimate: \$180,000



### Key Facts

- Project Type: Emergency Readiness
- Recovery Function: Infrastructure
- Project Location/Municipality: Guy Lombardo Ave, S Bayview Ave, S Long Beach Ave, S Main St, S Brookside Ave, N Main St, Merrick Rd, Sunrise Hwy
- Primary Target Area Affected: Freeport Village
- Consistency with NYRCR: Coordinate with regional initiatives
- Potential Beneficiaries: Freeport residents and businesses

### Project Information

This second phase of Lifeline Road Networks seeks to complement Lifeline Road Network lighting with wayfinding and destination signage, directing people toward evacuation routes, safer areas and Community Resource Centers (see P-6: Community Resource Centers). This will enhance route clarity and orient residents toward streets that should be used during and after future emergencies.

**Benefits:** Lifeline Road Network signage would secure local access routes to evacuation routes, critical facilities and Community Resource Centers (see P-6: Community Resource Centers).

**Relationship to Disasters:** NYRCR Freeport Committee Co-chairs, members of the public, and the Village of Freeport reported that there was a lack of clarity on which routes to use and which streets would provide access to evacuation routes, critical facilities, relief services and information centers during and after Sandy and other recent storms.



Signage along major roads can help direct residents to evacuation routes and safer areas



Signage would establish local access routes to community resource centers



# Community Resource Centers

Establish Community Resource Centers where Freeport residents can reliably access information, supplies and comfort

Cost Estimate: \$2,800,000



## Key Facts

- Project Type: Emergency Readiness
- Recovery Function: Health and Social Services
- Project Location/Municipality: Freeport Library, Freeport Recreation Center, Archer Street School, Bayview Ave School, JW Dodd School, Atkinson School, and Giblyn School
- Primary Target Area Affected: Freeport Village
- Consistency with NYRCR: Protect vulnerable populations
- Potential Beneficiaries: Freeport residents and businesses

## Project Information

Community Resource Centers seek to provide locations all across Freeport that can remain open and have backup power through storms and directly after storms. They will be fitted with backup power through Natural Gas generators.

They will create a network of locations for complimentary public resiliency information and education. They will be staffed with a Local Disaster Recovery Manager. Directional signage will orient residents from Lifeline Road Networks (see P-4 and P-5) to the Resource Centers. Digital signage will broadcast emergency information. Finally, they will stockpile emergency and recovery supplies.

**Benefits:** Community Resource Centers will provide backup power to critical community assets so they may stay open and provide resources and information to residents and businesses during and after storms. Providing information and educational material year-round will result in more informed residents and businesses for disaster preparation, action and recovery. Information will be conveyed in a format that is accessible to all residents and businesses, helping to reduce the burden on socially vulnerable populations.

**Relationship to Disasters:** During Sandy and other storms, there was a lack of clarity on where to go for information, comfort, and relief services. Freeport residents expressed frustration with lack of information on how and where to go for help. Further, residents were unable to access even the most basic resources. Many emergency support services provided by nonprofit groups and hosted by the Town of Hempstead did not distribute resources in Freeport.

It was cited that the Freeport Library was overstressed as a resource center. In addition, lack of safety, displacement from homes, access to drinking water, communication access, social isolation and food access were cited as major concerns which hampered community recovery.



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



Freeport's Atkinson School is a potential location for a Community Resource Center



# Operation SPLASH: Resilience Education Center

Protect Operation SPLASH's headquarters from flooding and develop a resilience education center

Cost Estimate: \$1,000,000



## Key Facts

- Project Type: Social and Community Services
- Recovery Function: Community Planning and Capacity Building
- Project Location/Municipality: 202 Woodcleft Avenue
- Primary Target Area Affected: Nautical Mile
- Consistency with NYRCR: Increase resiliency of key assets
- Potential Beneficiaries: Regional and Freeport residents and businesses

## Project Information

This project seeks to fortify and protect Operation SPLASH with innovative flood protection design and infrastructure. In addition, partnership with Nassau County higher education institutions will be sought to raise awareness of climate-related risks to the region and promote environmental stewardship.

The project will create a full-time position at Operation SPLASH to offer education and outreach programs related to coastal and community resilience and environmental protection.

**Benefits:** Flood protection will protect the critical community functions that SPLASH provides, and serve as a model for resilient design to other buildings in high and extreme risk areas. The educational component will enable SPLASH to widely broadcast the importance of resilient design, the responsibilities that come with living in a coastal region and the important role that ecosystems have in storm protection, pollution mitigation and quality of life. Linking with educational institutions and schools will enable SPLASH to offer the most contemporary and innovative education to a wide audience.

**Relationship to Disasters:** SPLASH was inundated with 16" and 4.5' in Irene and Sandy respectively and sustained building damages in both storms, their continued operation during and after storms is an essential community need due to their commitment to storm clean up, debris removal and community education and awareness.



Operation SPLASH is committed to improving the quality of life along Long Island shores



Operation SPLASH assisted the Town of Hempstead in clearing marine debris left after Sandy





# Nautical Mile Buoyant Architecture Demonstration

Identify and reconstruct a building on the Nautical Mile using buoyant architecture to provide a local example of flood resilient design

Cost Estimate: \$160,000



## Key Facts

- Project Type: Economic Development (Capital)
- Recovery Function: Economic
- Project Location/Municipality: Nautical Mile
- Primary Target Area Affected: Nautical Mile
- Consistency with NYRCR: Drive economic growth
- Potential Beneficiaries: Nautical Mile and waterfront businesses within Freeport and the region

## Project Information

Buoyant Architecture is the use of alternative foundation systems which allow buildings to 'float' when inundation occurs. This is a commonly used technique for resilient waterfront buildings in New Orleans and the Pacific Northwest, but has not yet been implemented on the East Coast.

This project will design and construct a buoyant building along the Nautical Mile to demonstrate the ability to economically and resiliently maintain a coastal economy.

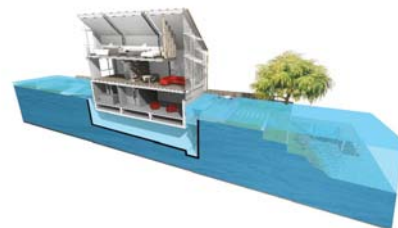
**Benefits:** Freeport is committed to being on the Shore and sustaining the Nautical Mile. Developing a proof of concept for buoyant architecture on the Nautical Mile would allow the Village to maintain this vision while reducing risk to the businesses on the Mile and mitigating future storm damage

In addition to improving resilience of coastal structures, this would maintain the character of local buildings and neighborhoods, retain access for elderly and disabled populations, prepare for sea level rise and in some cases reduce the cost of construction to comply with new building elevation requirements.

**Relationship to Disasters:** The Nautical Mile is identified in the NYRCR Freeport Conceptual Plan as the heart of the community and an important piece of the community's economy. The Nautical Mile sustained widespread damage during Sandy as homes and businesses were underwater.



Freeport's Nautical Mile hosts a number of bars, restaurants and retail services



Buoyant buildings rest on a concrete hull, which rises and falls with the water along vertical guideposts



# Modernize the Industrial Park Study

Identify and develop strategies to transform the Industrial Park into a modern, resilient and business-friendly industrial zone

Cost Estimate: \$500,000



## Key Facts

- Project Type: Economic Development (Assistance)
- Recovery Function: Economic
- Project Location/Municipality: Freeport Industrial Park
- Primary Target Area Affected: Freeport Industrial Park
- Consistency with NYRCR: Drive economic growth
- Potential Beneficiaries: Industrial Park residents, regional industrial businesses, and hopeful entrepreneurs

## Project Information

This project seeks to form a local nonprofit development authority that is committed to transforming the Industrial Park into a modern, environmentally conscious and resilient business center.

The study will outline implementation steps for the creation of the development authority. It will also propose design guidelines for safe, affordable and environmentally conscious light-industrial and commercial development. Short-term and long-term goals, strategies, actions and design concepts will be developed.

**Benefits:** Freeport lost nearly 2,000 jobs during and after the national economic recession and industrial employment opportunities are decreasing across the nation. However, industrial jobs pay comparatively higher salaries than other sectors in Freeport.

This project will create a roadmap to long-term economic growth and resilience; attracting jobs to Freeport and creating a steady stream of tax revenue to invest in Freeport's residents and improve quality of life.

Strategies on how to grow an industrial economy while maintaining and improving the local ecosystem will ensure environmental quality and stewardship are at the forefront of the modernization of the Industrial Park.

**Relationship to Disasters:** The Industrial Park is largely located in high and extreme risk areas. This, coupled with the risk of explosions from chemical/hazardous materials, makes the Industrial Park essential to protect from future disasters. Even during non-storm scenarios, minor flooding can result in environmental damage.



Freeport's Industrial Park could bring additional jobs and tax revenue to the community



The Industrial Park could be transformed into a modern, environmentally conscious, resilient business center

# Regional Transit Oriented Development, Access and Parking Study

Identify and develop opportunities for economic development and relocation to lower risk areas

Cost Estimate: \$500,000



## Key Facts

- Project Type: Planning and Additional Study
- Recovery Function: Economic
- Project Location/Municipality: Downtown Freeport
- Primary Target Area Affected: Downtown Freeport
- Consistency with NYRCR: Drive economic growth
- Potential Beneficiaries: Downtown Freeport businesses, businesses and residents in coastal areas wishing to relocate to lower risk areas

## Project Information

This study will identify opportunities to combine parking areas and develop structured parking facilities in key areas. Through the process of agglomerating parking, development opportunities may arise. The study will analyze these areas and provide recommendations on their best use based on community need. Guidelines for the design of resilient, sustainable and aesthetically pleasing parking structures will be identified. Strategies for financing parking structures and attracting and retaining businesses will also be identified.

Local transportation access is also an important element of a resilient community. This study will also develop a concept for local public transportation that connects Freeport's key business, retail and recreational areas. This service can also serve as a form of transportation for socially vulnerable populations and post-disaster circulation, when private vehicle and fuel access may be limited.

**Benefits:** Freeport will benefit from having a more robust and diversified economy, attracting tax revenue for community building and infrastructure projects. Diversified housing and business locations will provide opportunities for waterfront landowners to relocate within Freeport, while offering opportunities to prospective residents and business owners. Public safety and emergency response will be improved through safe vehicle storage and access.

**Relationship to Disasters:** NYRCR Freeport Committee Members identified the Nautical Mile and Industrial Park as key economic assets. However, they also recognize the importance of Downtown Freeport and the area around the LIRR station, as these places can provide an opportunity for new economic development and housing in less vulnerable areas.

Identifying opportunities to agglomerate parking into parking structures is important storage of private and emergency vehicles before, during and after storms – a need mentioned during previous public engagement meetings.



Development opportunities in Freeport's downtown could attract new businesses



Local transportation access is an important part of building a resilient community

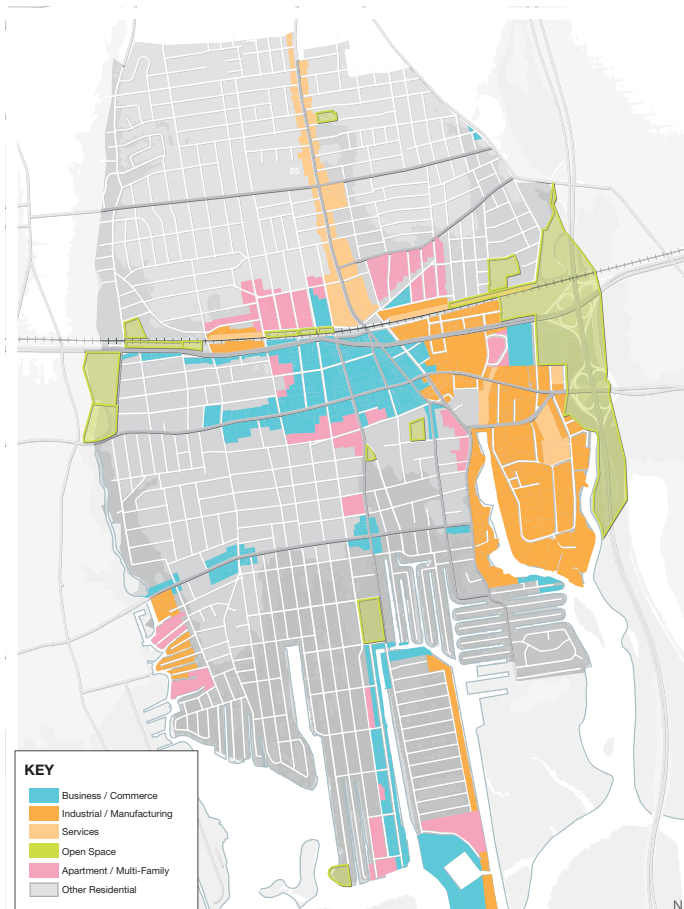




# Revise Zoning and Building Codes for Resilience

Recommend changes and updates to local zoning and building codes to incorporate resilient design

Cost Estimate: \$250,000



## Key Facts

- Project Type: Planning and Additional Study
- Recovery Function: Housing
- Project Location/Municipality: Freeport Village
- Primary Target Area Affected: Freeport Village
- Consistency with NYRCR: Address short, medium, and long-term risks
- Potential Beneficiaries: Residents living in high flood risk areas or in areas susceptible to storm damage

## Project Information

This project seeks to undertake a planning study and make recommendations to revise Freeport zoning, planning and building code regulations for resilient design.

The study will work with Freeport planning and building agencies to ensure that needs specific to the community's rebuilding efforts are not omitted or overlooked.

**Benefits:** Resilient design standards can help prevent such catastrophic economic losses in the future. In addition, more resilient housing design will help Freeport's coastal areas recover decreases in home values that have been documented since Superstorm Sandy.

**Relationship to Disasters:** Hurricane Sandy resulted in heavy damage to 3,500 housing units in Freeport. In addition, there are 3,900 homes in high and extreme risk flooding areas. 234 businesses applied for disaster management assistance, accounting for roughly 27.6 million dollars in damages. Only 8.4% of Freeport businesses and 26.7% of houses are located outside of the risk zones. In total, 65.4 million dollars of damage was assessed by FEMA. Yet many of these homes and businesses are not designed to reflect that risk.



Resilient design standards can help prevent economic losses from storm damage



Planning and building code regulations should support and provide a guide for resilient housing design