

# Goals & Recovery Functions

## Goals

- Increase resiliency of key assets
- Address short, medium, and long-term risks
- Balance costs and benefits
- Protect vulnerable populations
- Drive economic growth
- Coordinate with regional initiatives
- Outline steps for implementation

## Community Reconstruction Plan

### Six Recovery Functions



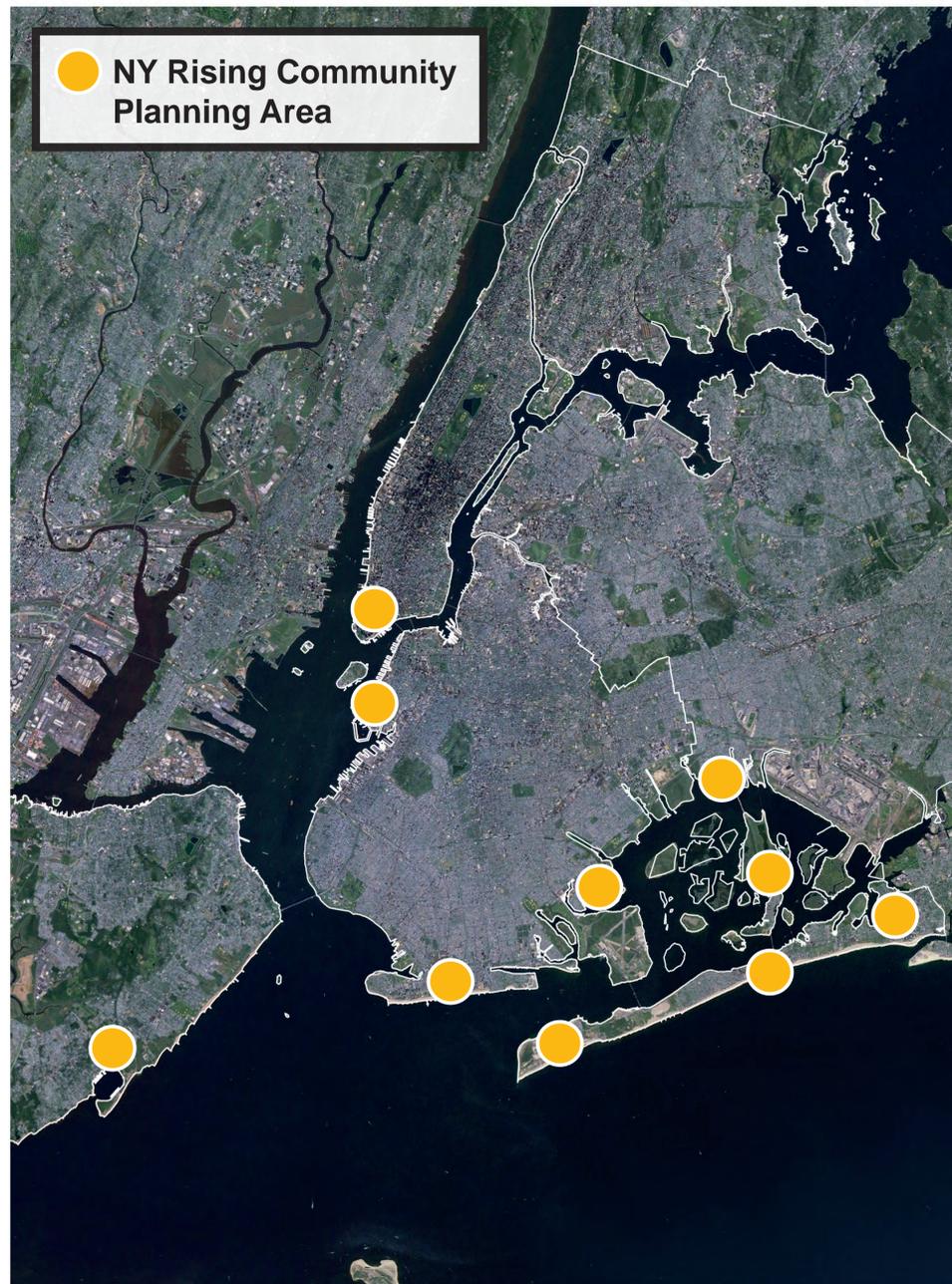
The NY Rising Community Reconstruction Program is helping communities impacted by Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy to rebuild and become more resilient through community-driven plans that consider current damage, future threats to community assets, and the community's economic future. Residents are here today to participate in a public meeting to learn more about the program and share their input on assets, needs, opportunities, and community vision to help shape the planning process.

Join the conversation!

#NYRising  
@NYStormRecovery  
NYStormRecovery



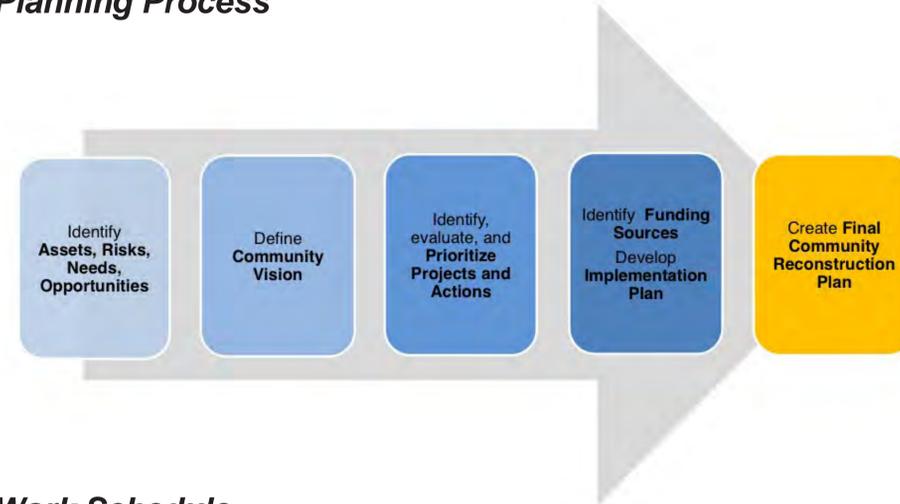
# Map of Communities in NYC



New York City contains 10 of the 43 communities in New York State undergoing the NY Rising Community Reconstruction process.

# Planning Process & Work Schedule

## Planning Process



## Work Schedule

- Planning Committee Meeting
- Public Meeting
- Deliverable Due Date

Deliverables	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
Work Plan		● Sept. 20							
Vision, Asset & Risk Assessments	● 1	●							
Draft Conceptual Plan		● 2	● 1	● Oct. 28					
List of Strategies			● 3	● 2	● Nov. 30				
Preliminary Project Reporting				● 4	● 5	● Dec. 31			
Confirm Priority Projects					● 6	● Jan. 31			
Project Analysis & Final Priority Project Selection					● 7	● 3	● 8	● Mid-March	
Final Community Reconstruction Plan							● 9	● Mar. 31	
Final Conference & Public Meeting									● 4 By May 12

For more information, please contact:  
[info@stormrecovery.ny.gov](mailto:info@stormrecovery.ny.gov)  
[www.stormrecovery.ny.gov](http://www.stormrecovery.ny.gov)

# Program Introduction NY Rising Community Reconstruction Plan



# Implement Targeted Coastal Protection Project: (A/B) Bayside Protection: Breezy Point



## Project Description:

The following 3 independent projects which are part of an overall comprehensive strategy for coastal protection in the Roxbury area.

1. Groins: repair 2 existing rock groins located on the western edge of the beach in Roxbury
2. Baywall: Construct a 350 ft long, 4 ft baywall on the western edge of the beach in Roxbury
3. Dunes: Construct a 1,000 ft long, 4 ft high dune on the eastern edge of the beach in Roxbury

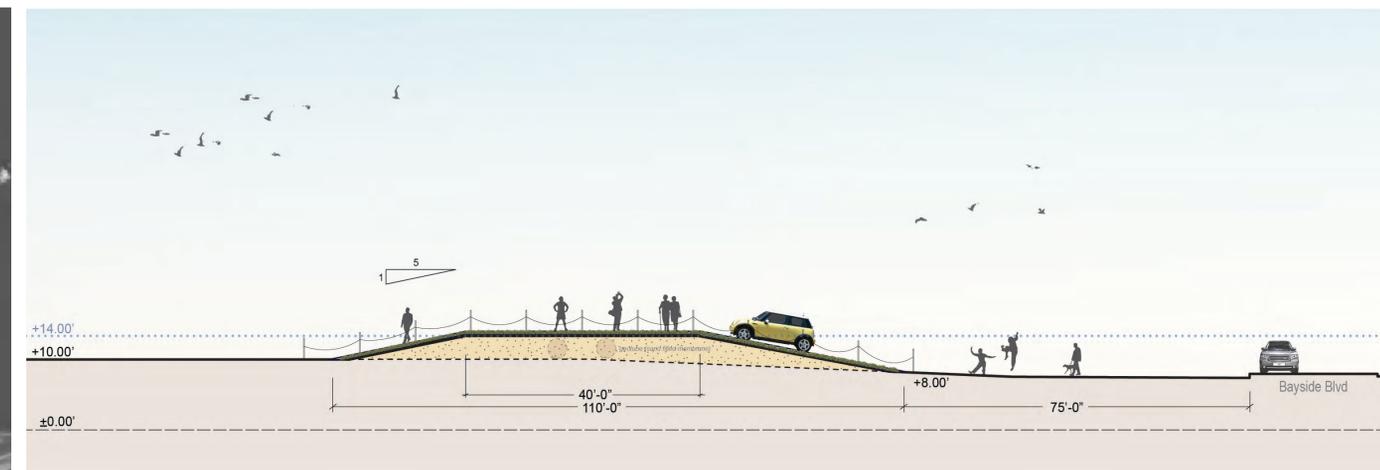
## Rationale:

The majority of Roxbury is highly exposed to storm events. While comprehensive coastal protection against the 100-year storm is both expensive and long-term, smaller-scale projects can protect against more frequent storm events, while still allowing continued beach access. Constructing a dune and wall along the bayside in Roxbury will protect the area against more frequent flooding from sea level rise, moon tides, and smaller storm events, along with reducing wave action. Repairing the two existing rock groins at the western boundary and Beach 181st will prevent erosion of the Roxbury beach, a natural defense against wave action and storm surge. Moving forward, these projects can be incorporated into a larger strategy for protection against a 100-year storm event.

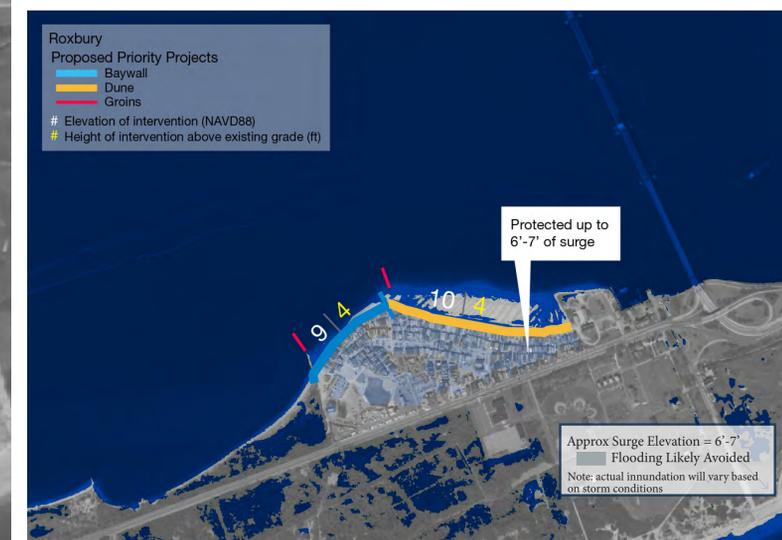
### Proposed Coastal Protection in Roxbury



### Proposed Dune at the Eastern Edge of the Beach at Roxbury



### Level of Protection from Proposed Coastal Projects



## Cost:

1. Groin repair and reconstruction (2): \$800 thousand - \$1.3 million
2. 4 ft baywall: \$1 million
3. 4 ft dune: \$7.5 million

**\$9.3 - \$9.8 million**

## Considerations:

1. Provides localized protection measures that do not protect against the 100-year storm
2. Challenge to realizing the remaining phases of full comprehensive protection against the 100-year storm
3. Potential to incorporate baywall into existing walkway



# Implement Targeted Coastal Protection Project: (A/B) Bayside Protection: Roxbury



## Project Description:

Comprehensive coastal protection in Breezy Point would require the construction of a floodwall or armored levee along the bay stretching from the Colony Theater west to existing dunes. The following are 3 separate smaller portions of the larger measure located at the most vulnerable areas.

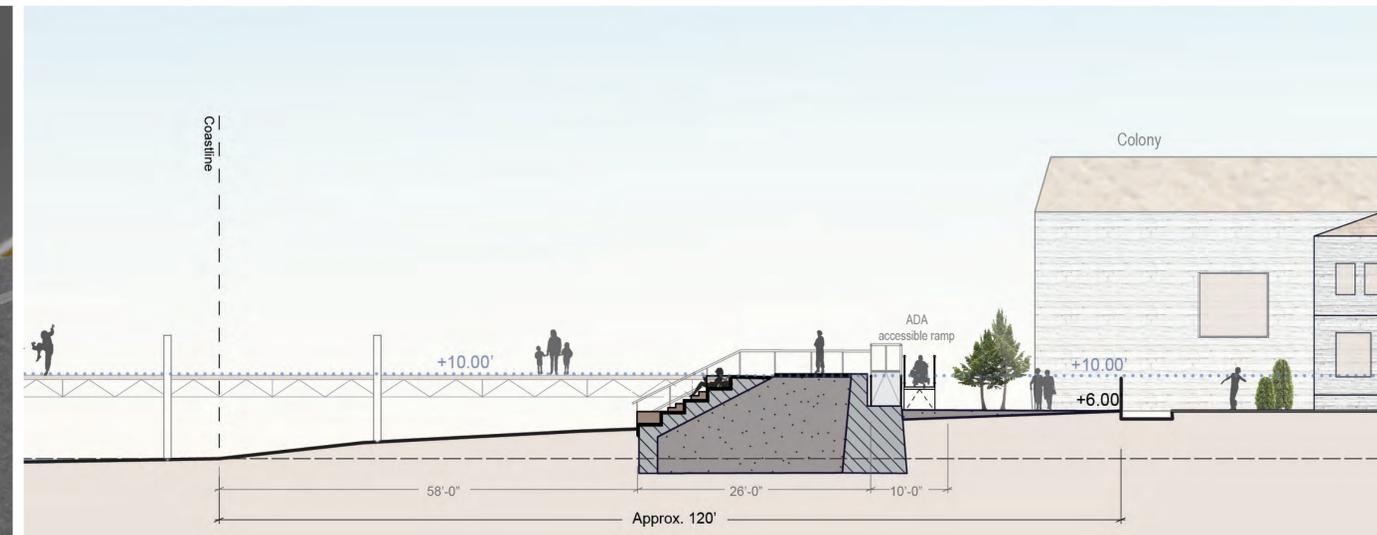
1. Kennedy's Baywall: construct an 1,000 ft long, 4 ft high baywall or armored dune between Kennedy's (Seabreeze Walk) and Clinton Walk
2. Ocean Ave Baywall: construct a 200 ft long, 4 ft high baywall from Ocean Avenue west until the first beach access road
3. Colony Theater Baywall: construct a 850 ft long, 4 ft high baywall between the Colony Theater (Reid Ave) and Bayside Ave

While independent, these projects are part of an overall comprehensive strategy for coastal protection in Breezy Point.

## Rationale:

The majority of Breezy Point is highly exposed to storm events. Comprehensive coastal protection against the 100-year storm is both expensive and long-term. Smaller-scale projects, including a 4' baywall and armored dune along the bayside, can protect against more frequent storm events, while still allowing continued beach access and unobstructed views. Constructing portions of the 4' baywall and armored levee at these three especially vulnerable areas creates a first step towards meaningful coastal protection.

### Proposed Baywall at the Colony Theater



### Level of Protection from Proposed Coastal Projects



## Cost:

1. Kennedy's 4' armored dune: \$7.5 million
2. Ocean Avenue 4' baywall: \$1.5 million
3. Colony Theater 4' baywall: \$6.5 million



## Considerations:

1. Provides localized protection measures that do not protect against the 100-year storm
2. Challenges to realizing the remaining phases of full comprehensive protection against the 100-year storm



# Implement Targeted Coastal Protection Project: (C) Raise or Protect Ocean Beach Access Trails



## Project Description:

Breezy Point's existing dunes on the oceanside provide natural coastal protection against wave action and storm surge. By enhancing existing dunes, along with filling in gaps created by access roads, Breezy Point can strengthen oceanside protection. Mats can be placed over the dunes to allow continued pedestrian, ADA, and emergency vehicle access to the beach.

## Rationale:

Currently, up to seven access points run along the Breezy Point oceanfront from Beach 222nd Street to Beach 201st Street. During Sandy, these access points had the effect of channeling storm surge, causing destruction to many homes in Breezy Points. These improvements would allow for beach access without compromising protection provided by dunes.

## Proposed Oceanside Coastal Protection & Beach Access



## Mobi-mats provide pedestrian, ADA, and vehicular access



## Costs:

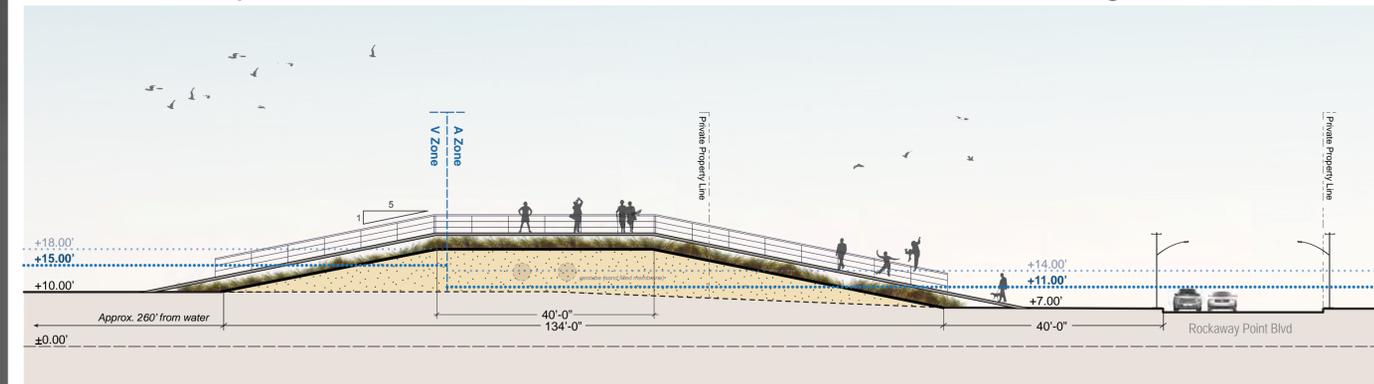
1. Dune infill and matting per access point: \$500,000
2. 7 access points: \$3.5 million

**\$3.5 million**

## Considerations:

- Possibility existing dune permit could be utilized
- Decision regarding number and location of access trails required
- Coordination and permitting with multiple city and state agencies may be required
- Raising a constructed access path over the dunes could be an alternative to matting (more expensive)

A raised access path over the dunes can be constructed as an alternative to matting



# Implement Targeted Coastal Protection Project: (D)Working with NPS



## Project Description:

Work with NPS to create a coordinated approach to comprehensive coastal protection in Breezy Point by creating a plan for cove restoration in conjunction with coastal protection measures.

## Rationale:

Cove erosion not only poses a threat to Rockaway Beach Boulevard, the sole means of evacuation in the community, but also plays a role in comprehensive coastal protection. Breezy Point coastal protection measures along the bay, including 4 ft baywalls, armored dunes, dunes, and groins, can only provide protection up to a certain extent. NPS land to the east and west of Breezy Point and Roxbury serve as inundation points for storm surge. Working with NPS to facilitate cove restoration would provide protective measures in these otherwise vulnerable areas, allowing for greater coastal protection in Breezy Point.

Existing Conditions and Breezy Point Proposed Interim Protection Measures



Level of Protection from Proposed Interim Projects (5'-6' surge)



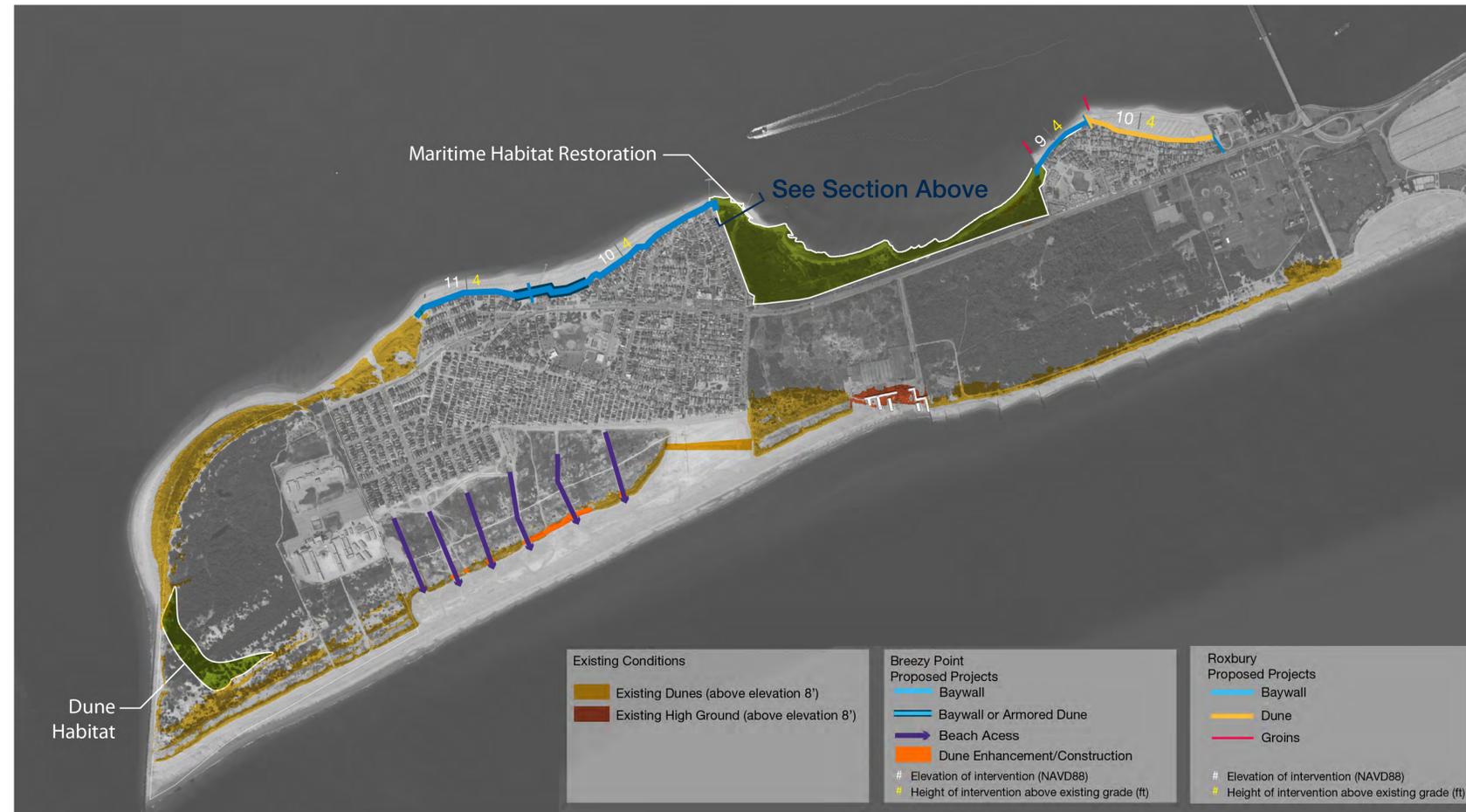
Impact of 8' to 9' Surge with Community Protection in Place



Proposed Maritime Habitat Restoration and Sand Dunes along Breezy Point's Eastern Border with NPS



Proposed Coastal Protection in Roxbury



Potential reduced Impact Upon Community from NPS Protective Measures



## Considerations:

- Coordination with NPS required
- Coordination and permitting with multiple other city and state agencies may be required
- Evaluation of the impacts of the proposed resiliency measures on restoration and environmental degradation required.
- Challenges to realizing the remaining phases of full comprehensive protection against the 100-year storm



# Implement Targeted Coastal Protection Project: (E) Raise Rockaway Point Boulevard



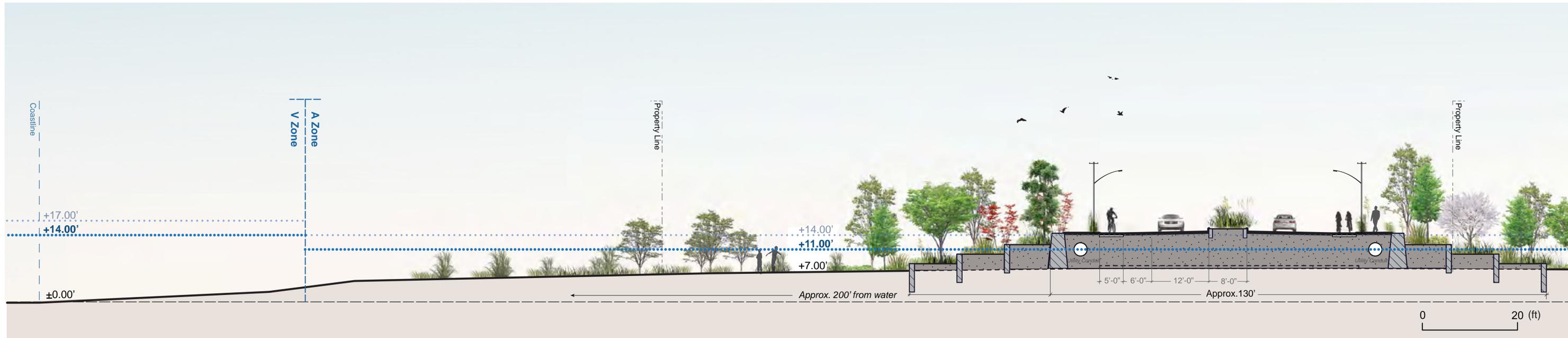
## Project Description:

Raise Rockaway Point Boulevard approximately 7 feet to above the base flood elevation (10 ft to 11 ft). Approximately 4,500 ft of the road stretching from Roxbury to Breezy Point would be reconstructed on top of a mounded levee to provide protection against wave action and storm surge. The newly elevated road would provide space beneath the roadway, allowing utility infrastructure to be relocated below ground.

## Rationale:

Rockaway Point Boulevard provides the sole means of access between Breezy Point and the rest of the Rockaway Peninsula. Rockaway Point Boulevard remains vulnerable to flooding from storm events, and the continued erosion of The Cove. After Sandy, the roadway was flooded, limiting evacuation and leaving the community inaccessible to emergency services. Raising Rockaway Point Boulevard creates a resilient roadway that is protected against future storm events, allowing access to be maintained to and from Breezy Point.

### Proposed Rockaway Point Boulevard Raising



### Proposed Location of Raised Boulevard



### Existing Road Conditions



### Costs:

**\$70 million**

### Considerations:

- Elements of the roadway raising project are standard and feasible methods commonly employed by New York City agencies.
- Rebuilt roadway alignment requires greater width than it currently occupies to allow for drainage slopes. While the entire roadway width currently lies within NYCDOT ownership and jurisdiction, widening the roadway may lead to encroachment on National Park Service lands.
- Additional/secondary access through National Park Service lands would be required during the construction period.



# Transportation/Infrastructure: **(F) Build New Docking Facilities for Emergency Use**



## Project Description:

Replace two existing docking facilities located along the bay in Breezy Point near Kennedy's and the Colony Theater. Replaced docks would be able to accommodate ferry and emergency vehicles.

## Rationale:

These docks were destroyed in Sandy, and would provide a needed redundancy for evacuation/egress and access to the community for emergency service providers.

### Existing Dock Conditions



Dock near Kennedy's  
Existing Conditions



Dock near the Colony Theater  
Existing Conditions

## Costs:

1. Dock near Kennedy's: \$1.2 million
2. Dock near Colony Theater: \$2.0 million

**\$3.2 million**

## Considerations:

- Coordination and permitting with multiple city and state agencies may be required
- Design dependent on future use (public ferry service versus emergency use only)

# (G) Improve Drainage in Key Areas



## Project Description:

Several areas of Breezy Point/Roxbury experience stormwater drainage problems, some of which got worse after Sandy. In the residential area southeast of Bedford Ave/Rockaway Point Blvd, the Rockaway Point Ballfields, and the Roxbury main parking lot, water ponded for weeks after the flood had receded. These areas tend to experience ongoing problems with stormwater, even during normal rain events. These stormwater management projects address the problem of water ponding in low-lying areas with a multi-pronged approach tailored to the specific conditions in each area.

## Rationale:

The solutions to stormwater issues depend on the specific conditions in each area. Paved areas create stormwater runoff, which can be rectified with the use of permeable materials that allow water to infiltrate into the ground. Areas of low elevation are a natural place for water to drain to and can either be raised with fill or can be drained with storm drains. Because Breezy Point in general is low-lying and very flat, drainage systems cannot rely on gravity, so pumps are used to move water.



### 1. Ballfields Area:

- Replace paved areas with permeable materials for more effective infiltration & runoff reduction
- Raise the ballfield with fill, regrading, and landscaping fill so that it no longer acts as a natural bowl
- Install a collector system and pump water to the south side of the dunes

### 2. Residential Area:

- Install a new network of drainage pipes to collect stormwater
- Install central pumping station to pump water into the dune system

### 3. Parking Lots:

- Replace paved areas with permeable materials for more effective infiltration & runoff reduction
- Install storm drains to collect stormwater
- Install pump station to convey collected water to bay side dune area

## Costs:

1. Ballfields Area: \$3 million
2. Residential Area: \$4 million
3. Parking Lots: \$2 million

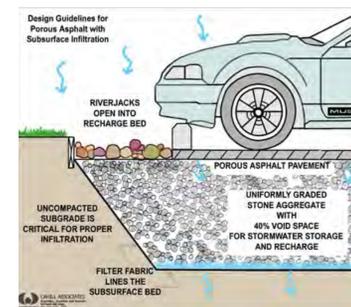
**\$9 million**

## Considerations:

- Promotes access to residential areas and community gathering places
- May reduce opportunity for mosquito breeding
- May require coordination and permitting with NYS Department of Environmental Conservation, US Army Corps of Engineers, NYC Department of Buildings, NYC Department City Planning, and NYS Department of State
- Each area will experience disruption during construction period



Collection System and Pump



Permeable Materials



# (G) Improve Drainage in Key Areas



## Project Description:

The goal of this project is to create a more easily navigated center of the community that is not as susceptible to flooding, improves traffic flow, and is aesthetically pleasing.

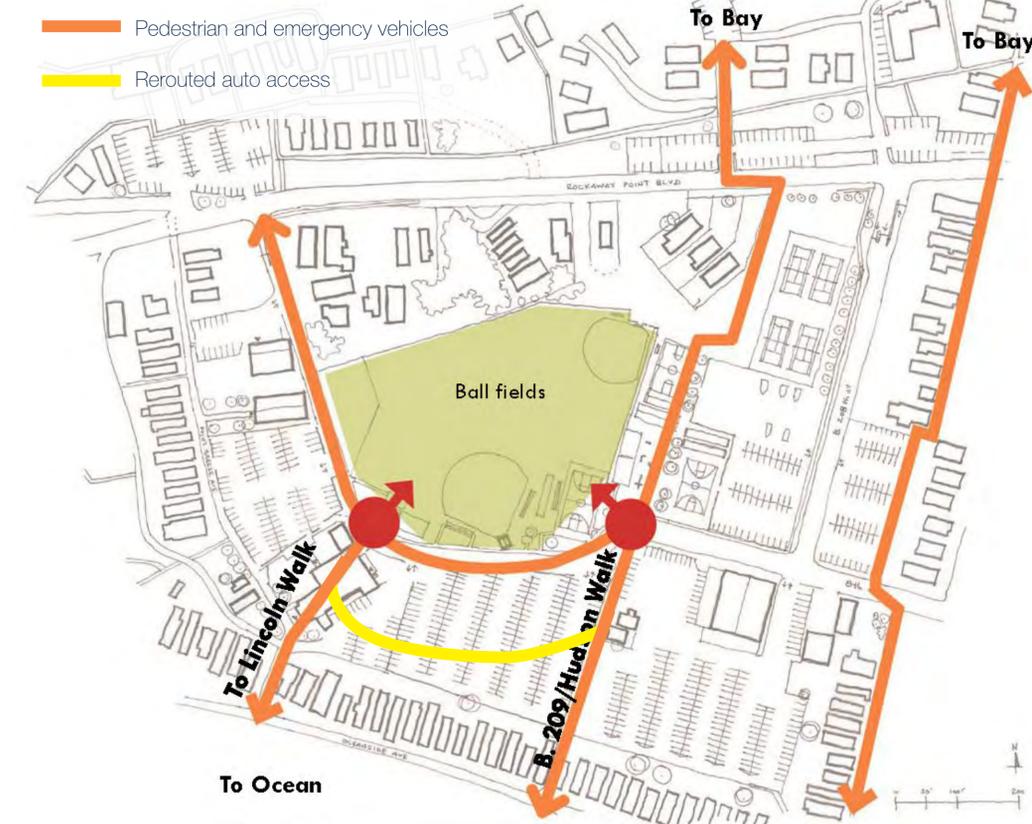
Existing circulation in Breezy Point



Example of rain garden infrastructure to improve drainage



Opportunity to improve N-S circulation and entry to ballfields



Opportunity: Leverage drainage solutions for aesthetic and ecological benefit



Example of drainage control in parking lot (see drainage board for cost estimates)



Example of solar shading structures



# (H-L) Create Breezy Point Relief Campus

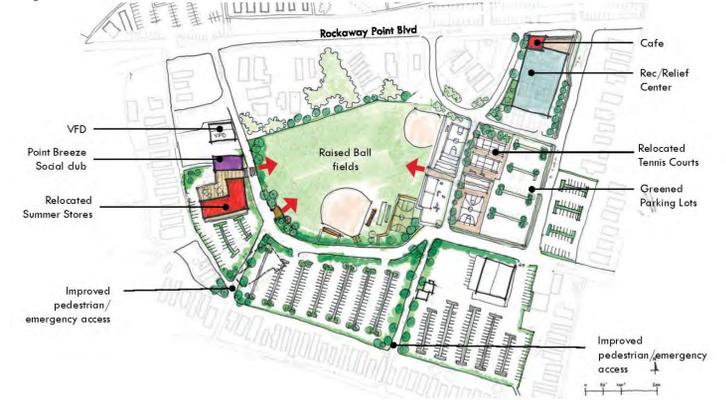


This idea ties together many different projects with the goal of creating a relief campus in Breezy Point that will help the area to quickly rebound from a storm or emergency event. These projects will also help make the area more resilient to normal storm events:

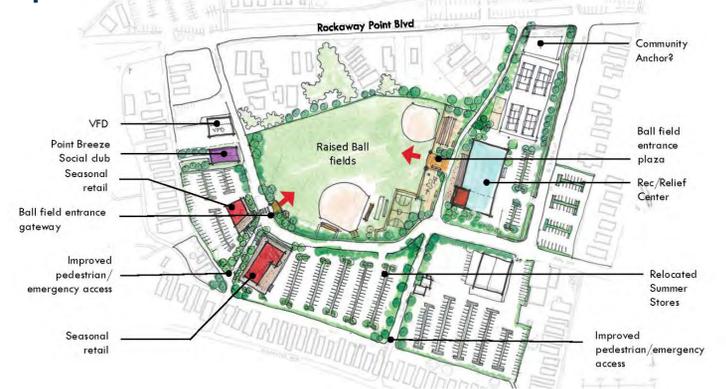
- (G) Improve drainage in key areas**  
Create a more easily navigated center of the community that is not as susceptible to flooding is the goal of this project, which improves traffic flow and is aesthetically pleasing.
- (H) Build multi-purpose relief community center**  
This project proposes a 18,000-20,000 relief center that would become the center for info and operations during and after an emergency and would function as a recreation and community center in normal conditions. The committee is proposing two options for the siting of this building (see diagrams right), as well as how recreation elements can be used or moved around (see below).
- (I) Relocate summer stores with resiliency improvements**  
This project would create more resilient commercial buildings in Breezy Point, allowing not only for these businesses to reopen quickly after an event and move quickly towards restoration of services, but also to protect from regular flooding.
- (J) Harden or expand Co-op office as communication hub**  
This project proposes to harden the Co-op office building with alternate power sources and communication systems to serve as an information and emergency operations hub.
- (K) Develop new residential units in Breezy Pt**  
Evaluate opportunities to develop addition housing on under developed areas near the ballfields and Rockaway Pt. Blvd

## Options for Siting Stores and Relief/Recreation Center

### Option 1



### Option 2



## Existing Recreation in Breezy

Inventory	
<span style="color: purple;">■</span>	4 Tennis Courts
<span style="color: teal;">■</span>	3 Basketball Courts
<span style="color: orange;">■</span>	5 Bocce Courts (mixed surface)
<span style="color: pink;">■</span>	2 Handball Courts
<span style="color: brown;">■</span>	1 Playground
<span style="color: olive;">■</span>	1 Sand Volleyball court

**What do you use? What is expendable?  
What would you like to see here?**



# (H) Build Multi-Purpose Relief Center

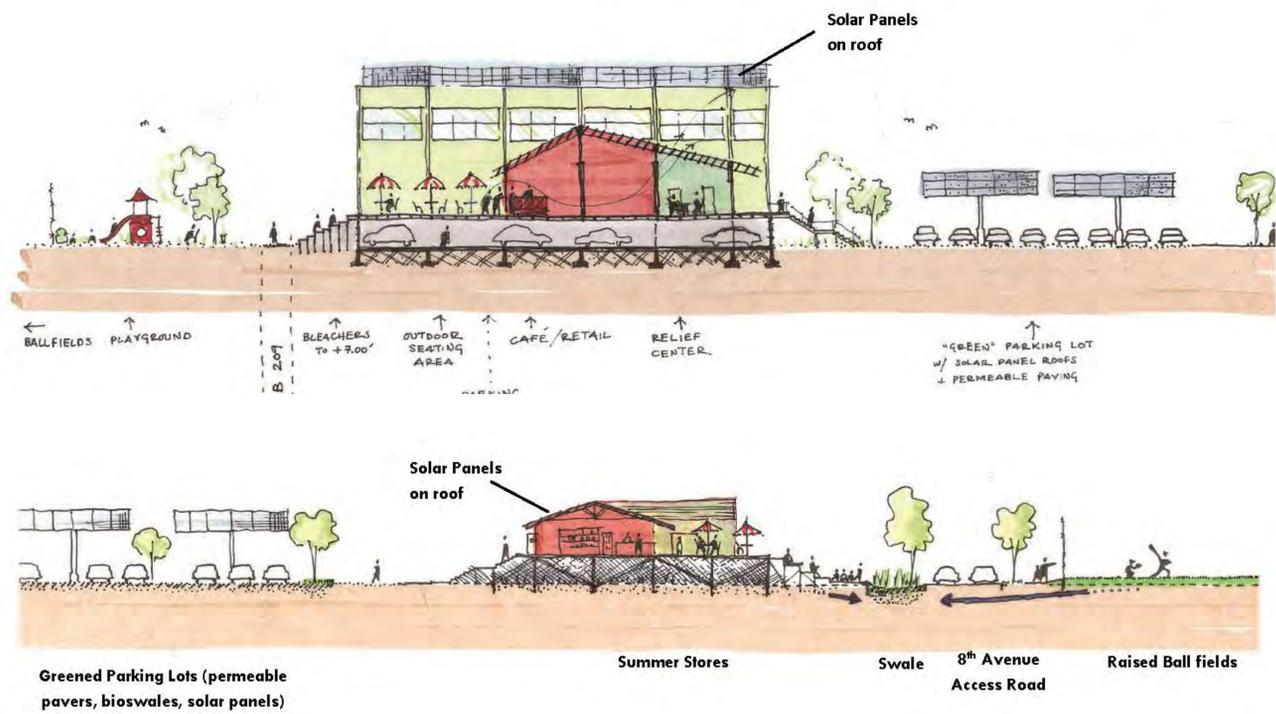


## Project Description:

This project is a 18,000-20,000 relief center to house the coordination of emergency services during a disaster, such as access to food, water, health and medical services. A relief center is not an evacuation center or shelter; rather, it provides a central location for information and community gathering and services during an emergency. Two options exist for the siting of this building, depending on how recreation elements can be moved.

## Siting Options: H1

Two main options exist for the siting of the relief center, depending on the reorganization of existing recreational facilities (see "Create Breezy Point Relief Campus" board for more information)



## Rationale:

The Office of Emergency Management (OEM) functions best during disasters when it executes plans and priorities that have been agreed to prior to a disaster. While relationships between OEM and local community organizations already exist, there are areas where organizations could be leveraged to lend greater support to their communities, particularly if they are able to partner prior to an event and clearly establish roles and responsibilities for a specific operation. Relief centers can provide important emergency functions such as: bring together a range of local social services, formalize efforts to reach out to vulnerable populations, help OEM evaluate community needs and efficiently distribute resources.

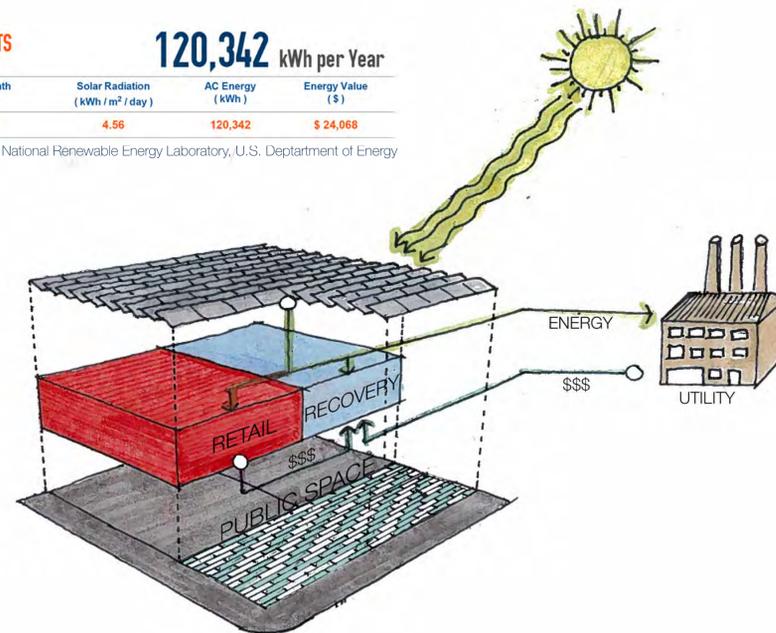
~7,000 SF of mounted solar cells will not just provide a resilient back-up power source in emergencies, but can be a source of revenue that offsets energy costs as excess power is sold back into the grid. A solar array of this size in Breezy Point would generate approximately \$24,000 annually.

**RESULTS**

**120,342 kWh per Year**

Month	Solar Radiation (kWh / m <sup>2</sup> / day)	AC Energy (kWh)	Energy Value (\$)
Annual	4.56	120,342	\$ 24,068

Source: National Renewable Energy Laboratory, U.S. Department of Energy



## Timeline

**2-3 years**  
to implement and ramp-up

## Cost

**~\$5.2 million**  
<\$5 million capital, \$200,000 program/operations

Costs include:  
**Programming costs** - \$100,000 a year x 2 years for staff to manage resilience, plan emergency preparation and response, mobilize and train community, connect vulnerable populations

**Building hardening** - including flood proofing, physical improvements, ensure space and communication equipment, and back-up power

- Building components would include:
- Recreational Amenities – Indoor Basketball/Volleyball
  - Locker Rooms/Showers
  - Meeting Rooms
  - Office Space
  - Daycare Center/Seniors Lounge
  - Community kitchen/Catering
  - Off-grid energy option

## Considerations

Ongoing maintenance costs not estimated at this time.



# (I) Relocate Summer Stores



## Project Description:

This project would create more resilient commercial buildings in Breezy Point, allowing for these businesses to reopen quickly after an event and help to establish restoration of everyday services. Breezy Point does not have many commercial buildings, but the ones that do exist are vulnerable to regular flooding.

## Rationale:

Relocating the summer stores will help to create a new resilient commercial building type in Breezy Point, one that is better able to withstand surging waters and storm conditions, as well as regular flooding, which will improve their ability to remain a part of the community fabric for a long time. Additionally, with related projects as a part of the Breezy Point Relief Campus, this project will help to establish a freshly defined heart of the community.

Existing summer stores



Existing summer stores



## Timeline

2-3 years

## Cost

\$2.5 million  
which could include funding from Co-op

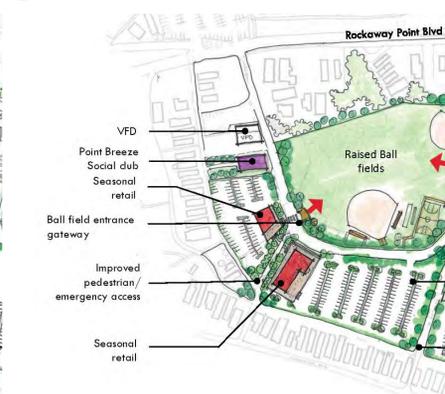
## Siting Options:

Two main options exist for the siting of the relocated summer stores, depending on the reorganization of existing parking.

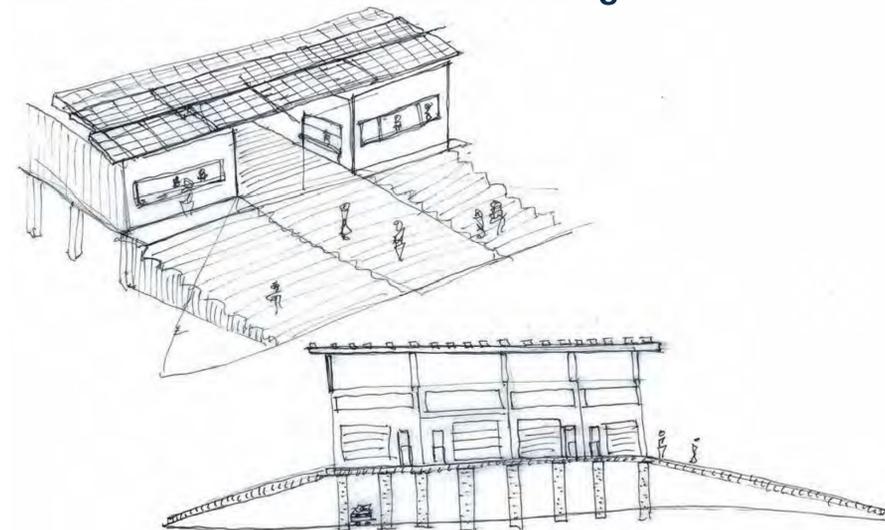
I1



I2



## Sketch of raised commercial building



## Considerations

- Where should shops be located?
- Is there interest in new retail stores or restaurants?



# (K-M) Improve the Resiliency of Housing



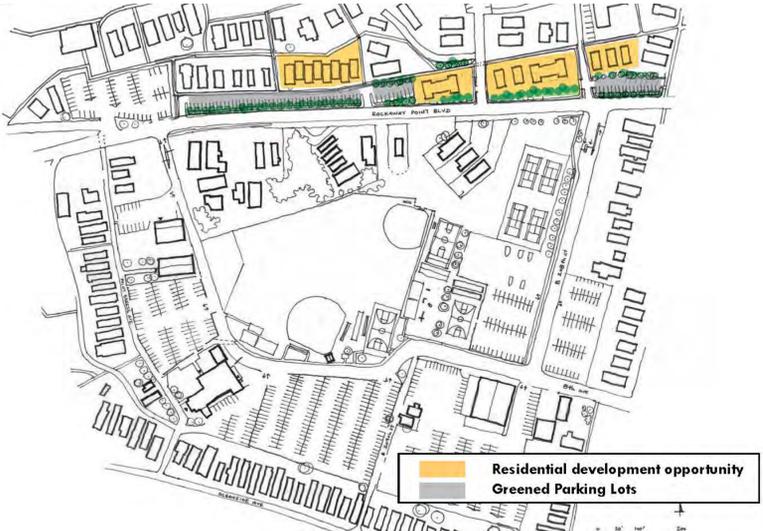
## Project Description:

These projects would help to improve the resiliency of people's homes - the most important assets in the community. This would be accomplished both by building new elevated housing in Breezy Point and a larger section of elevated housing in Roxbury for the senior population, as well as negotiating with a contractor for a bulk fixed rate to elevate houses in the community.

## Rationale:

Sandy exposed the vulnerability of housing on the Rockaway Peninsula, which was even more pronounced in Breezy Point and Roxbury. Coastal protection is needed, yet these interventions will require time to fully implement at a scale that would protect against storm surge. The best protection would be both to harden the coastline and to elevate houses, ensuring that occupiable floors are safely above the flood elevation. Additionally, these projects would better address the needs of seniors, a significant and growing population in the community.

### (K) Develop new residential units in Breezy Pt.



### (L) Develop new residential units for seniors in Roxbury



### Timeline

3-4 years

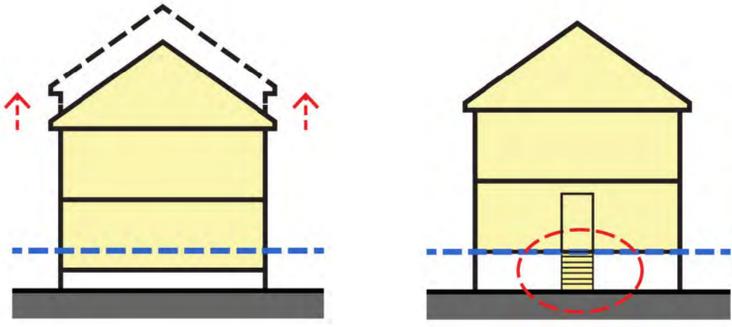
### Cost

TBD  
depending on project scope and development program

For all projects, the scale and program of these projects would have to be determined by the community, which would drive both the design and construction timelines along with the associated costs.

The elevated housing project will require a negotiation to determine the level of participation needed to achieve the fixed rate.

### (M) Negotiate with contractor for bulk rate to elevate houses



# (N) Build or Designate Roxbury Relief Center



## Project Description:

Create a relief center to house coordinated emergency services during a disaster, such as access to food, water, health and medical services. A relief center is not an evacuation center or shelter; rather, it provides a central location for information, community gathering, and services during an emergency. Because emergencies are unpredictable and irregular events, relief centers should be housed within an existing building or organization that provides year-round community services.

## Rationale:

During Sandy, while large agencies and organizations such as Office of Emergency Management (OEM), FEMA, and the Red Cross provided substantial support, smaller community organizations also provided critical local and immediate response and recovery services, such as distributing food, water, and supplies and going door-to-door to check on vulnerable populations. Across the city, groups coordinated their activities through informal relief centers—physical spaces manned by volunteers that served as central hubs for the distribution of information and resources. This program formalizes this process, by identifying and bolstering a key hub in a central location in Roxbury.

## Options for Relief Center Locations



## Timeline

1-2 years

## Cost

\$500,000-  
\$2 million

depending on site  
conditions/construction  
needed

This cost and timeline covers:

- Implement capital improvements
- Build off of existing emergency program for social resiliency

(1) **Capital** to harden existing building or facility, which includes flood proofing and installation of alternate power source

(2) **Program and operations** support to complement and build upon host organization's capacity to provide year-round emergency programming and to deploy resources during an emergency.





## Priority and Featured Projects

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- (A/B) Breezy Point and Roxbury coastal protection projects**
- (C) Raise or protect ocean beach access trails**
- (D) Working with NPS**
- (E) Raise Rockaway Point Blvd**
- (F) Build new docking facilities for emergency use**
- (G) Improve drainage in key areas**

## Other Projects and Policy Recommendations

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- Implement long-term comprehensive coastal protection project
- Build regional surge barrier in Jamaica Bay that does not negative affect Breezy Point



# Create Breezy Point Relief Campus



## Priority and Featured Projects

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- (G) Improve drainage in key areas**
- (H) Build multi-purpose relief community center**
- (I) Relocate summer stores**
- (J) Harden or expand Co-op office as communication center**
- (K) Develop new residential units in Breezy Pt.**

## Other Projects and Policy Recommendations

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- Upgrade hydrants and water lines
- Create emergency/secondary access road on NPS property
- Bolster Volunteer Fire Departments
- Create emergency preparedness training program
- Meet with LIPA to discuss alternative energy sources, including future long-term microgrid study or pilot project, on-shore wind project, and solar installations on utility poles in Breezy Point
- Establish alternative access and safety plans for emergencies with FDNY and NYPD





## Priority and Featured Projects

---

- (G) Improve drainage in key areas**
- (N) Build or designate Roxbury relief center**
- (L) Develop new residential units for seniors in Roxbury**

## Other Projects and Policy Recommendations

---

- Upgrade hydrants and water lines
- Create emergency/secondary access road on NPS property
- Bolster Volunteer Fire Departments
- Create emergency preparedness training program
- Meet with LIPA to discuss alternative energy sources, including future long-term microgrid study or pilot project, on-shore wind project, and solar installations on utility poles in Breezy Point
- Establish alternative access and safety plans for emergencies with FDNY and NYPD





Economic Development



Infrastructure



Natural & Cultural Resources

## Priority and Featured Projects

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- (K) Develop new residential units in Breezy Pt.**
- (L) Develop new residential units for seniors in Roxbury**
- (M) Negotiate with contractor for bulk rate to elevate houses**

## Other Projects and Policy Recommendations

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- Create program to help individual homeowners assess physical condition and resiliency of both primary and secondary homes
- Create program to help individual homeowners understand financing options for making improvements of both primary and secondary homes
- Create program for training of community to understand insurance and other resiliency-related housing issues
- Fill financial gaps in scope of housing resiliency and recovery programs for homeowners