



Rockaway West Planning Committee Meeting #4

November 14, 2013

An aerial, grayscale photograph of a coastal city, likely Miami, showing a dense urban area with many buildings, a large beach, and the ocean. The image is tilted slightly to the right.

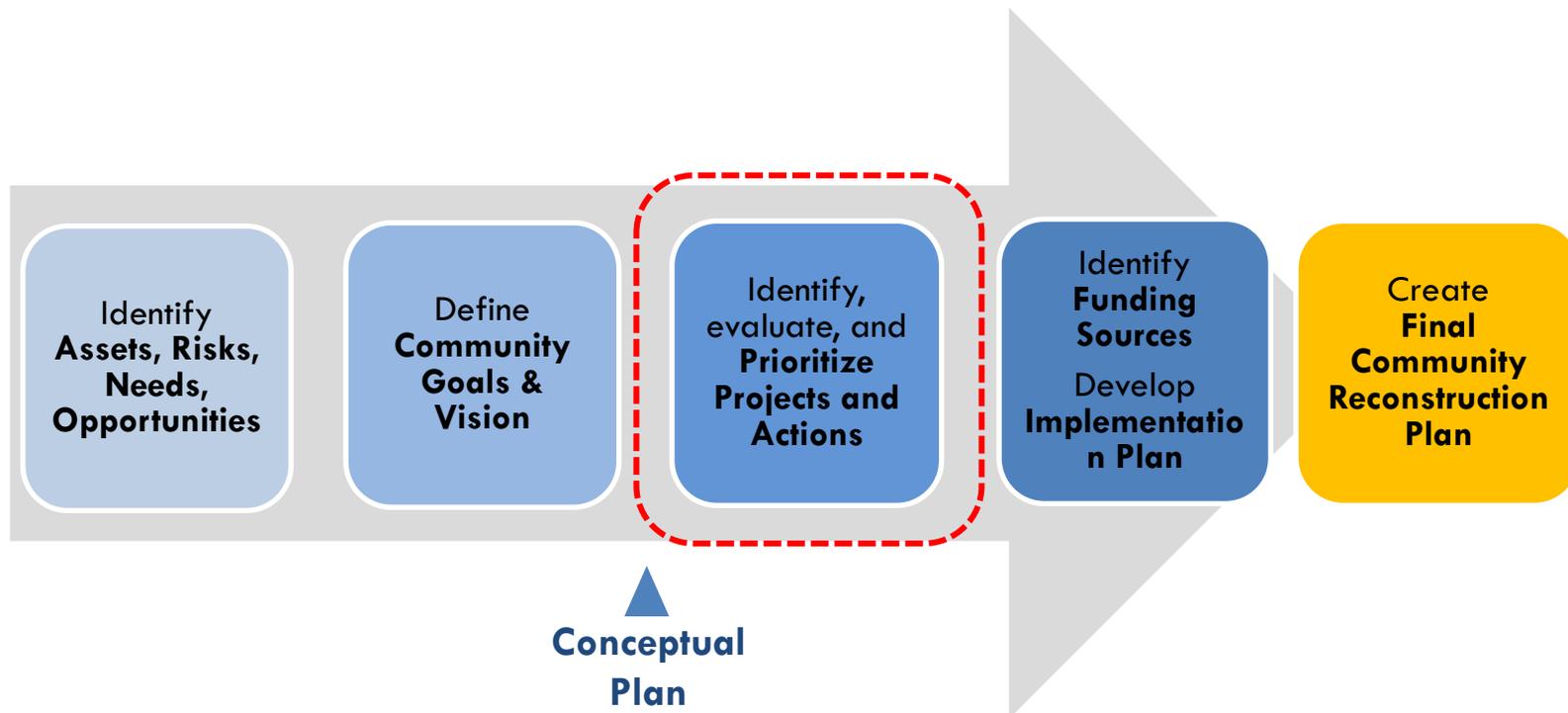
Agenda

- 1. Project Update** **7:00 – 7:15**
- 2. Initial Strategies & Projects** **7:15 – 8:15**
- 3. Q&A and Next Steps** **8:15 – 8:30**

Today's meeting will focus on developing strategies and initial project ideas for the Rockaway West communities.

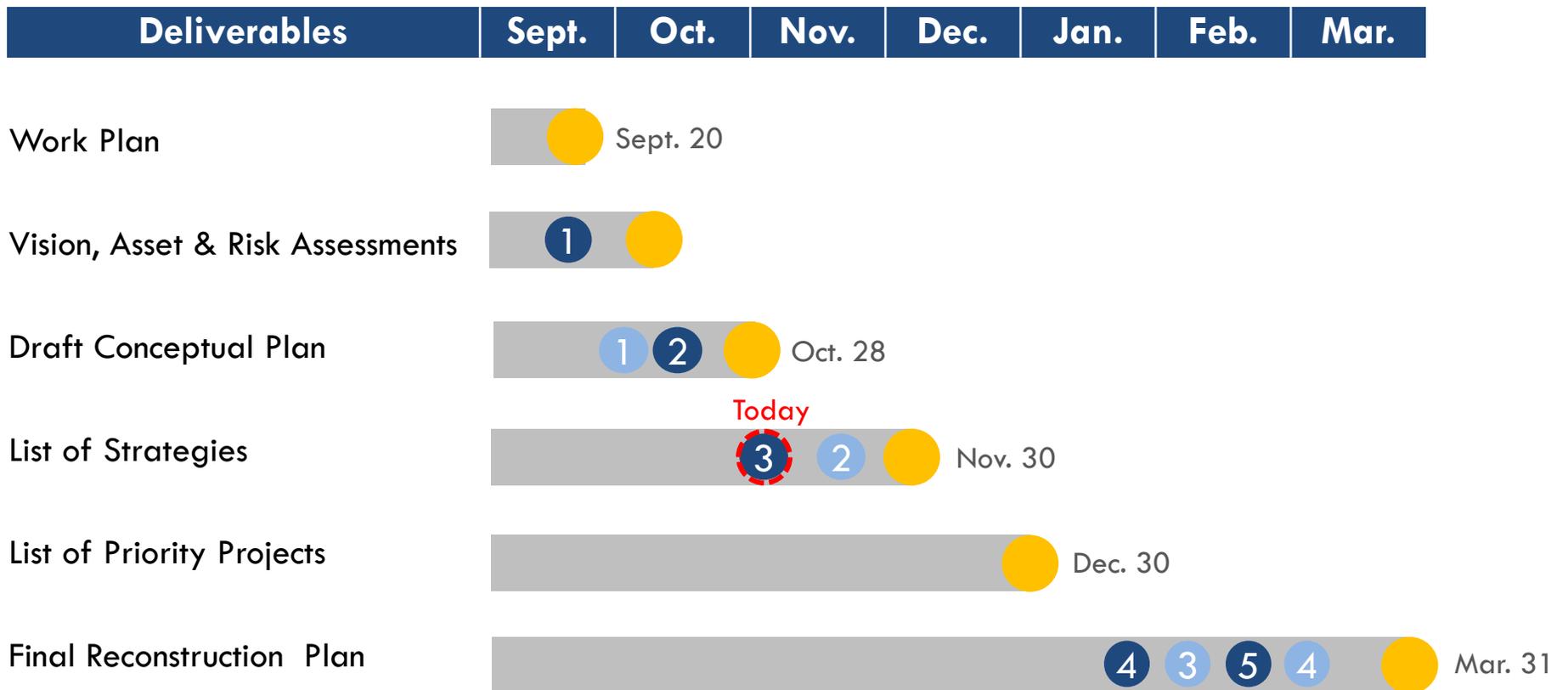
Objectives:

1. Discuss strategies and projects
2. Prepare for Public Meeting #2



NY Rising Community Reconstruction program schedule

- Planning Committee Meeting
- Public Meeting
- Deliverable Due Date



Conceptual Plan completed

Rockaway West Community Reconstruction

Conceptual Plan
October 2013

To be posted on NY Rising website:

<http://stormrecovery.ny.gov/nycrcr/community/rockaway-west>



Online feedback

<http://rockawaywest.nyrisingmap.org/>

NY Rising: Rockaway West WHAT TO DO

SIGN IN WITH [Twitter](#) [Facebook](#)

ECONOMIC

113-01 BEACH CHANNEL DRIVE

Employment Hub.
Risk zone: High

Corrections **Issues (1)**

Tell us about this asset's storm recovery and resiliency needs, such as the need to repair or replace a damaged asset, the need to make an asset more resilient, or the need to create a new asset to support resiliency. Suggest projects and actions for rebuilding and resiliency for this asset or location.

The bay wall needs to be raised in height and repaired from the gil hodes bridge to far rockaway and the sewer system needs to be revamped with check valves

Michael Redpath
AROUND A DAY AGO

Comment

Your Name

Report Issue

Asset categories:

- Economic
- Health and Social Services
- Housing
- Infrastructure Systems
- Natural and Cultural

Comments on the whole neighborhood

- Michael Redpath** commented on 113-01 BEACH CHANNEL DRIVE
- NY Rising Team** commented on WATERSIDE SCHOOL FOR LEADERSHIP
- NY Rising Team** commented on 112-30 ROCKAWAY BEACH BLVD
- NY Rising Team** commented on 112-16 ROCKAWAY BEACH BLVD
- Marissa Bernowitz** commented on WATERSIDE SCHOOL FOR LEADERSHIP
- Marissa Bernowitz** commented on 112-30 ROCKAWAY BEACH BLVD
- Marissa Bernowitz** commented on 112-16 ROCKAWAY BEACH

Powered by *Shareabouts*, a project of *OpenPlans*

Or email: info@stormrecovery.ny.gov

NY Rising Governor's Conference – October 22, 2013



“NY Rising to The Top” competition

NY Rising Community Reconstruction Program Funds:

Rockaway West: up to \$21.3 million

Possible additional funds (\$3 million per category)

1. Regional Collaboration
2. Use of Technology in the Planning Process
3. Community Involvement
4. Inclusion of Vulnerable Populations
5. Use of Green Infrastructure
6. Innovative and Cost-Effective Financing
7. Infrastructure Investment with Multiple Co-Benefits
8. Approach to Resilient Economic Growth

Public outreach – Public Meeting #2

Outreach to Date

Additional

- Translated?
- eBlast
- Other?



The flyer features the 'NY RISING COMMUNITIES' logo at the top left, which is a circular emblem with a sun rising over a map of New York. To the right of the logo, the text reads 'New York Rising Community Reconstruction Program' and 'Public Meeting #2'. Below this is a blue banner with the text 'Make Your Voice Heard!'. The event details are listed: 'Tuesday, November 19, 2013', '7:00pm-8:30pm', and the location 'Martin De Porres High School, 140 Beach 112th Street'. The background of the flyer is a map of a coastal area with three speech bubbles containing questions: 'How can we improve our power and drainage?', 'How can we strengthen the ocean and bayside edges to protect the community?', and 'How can we better prepare our community for an emergency?'. At the bottom, there is a section for online input: 'PROVIDE INPUT ONLINE: <http://nyrisingmap.org>', followed by contact information: 'For more information, please contact: info@stormrecovery.ny.gov' and 'www.stormrecovery.ny.gov/community-reconstruction-program'. On the right side of the bottom section, there is a Twitter logo and the text '#NYRising @NYStormRecovery'.

NY RISING COMMUNITIES

New York Rising Community Reconstruction Program
Public Meeting #2

Make Your Voice Heard!

Tuesday, November 19, 2013
7:00pm-8:30pm
Martin De Porres High School
140 Beach 112th Street

How can we improve our power and drainage?

How can we strengthen the ocean and bayside edges to protect the community?

How can we better prepare our community for an emergency?

PROVIDE INPUT ONLINE: <http://nyrisingmap.org>
For more information, please contact: info@stormrecovery.ny.gov
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#NYRising
@NYStormRecovery

An aerial, high-angle photograph of a coastal city, likely Miami, showing a dense urban area with many buildings, a large beach, and the ocean. The image is tilted slightly to the right and has a light, semi-transparent overlay.

Agenda

1. Project Update 7:00 – 7:15
- 2. Initial Strategies & Projects 7:15 – 8:15**
3. Q&A and Next Steps 8:15 – 8:30

Strategies, Approaches, and Projects

Strategy

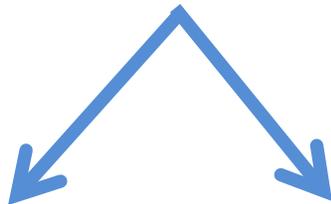


Short-Term/Long-Term Goals



Approach A

Approach B



Project 1

Project 2

Project 1

Project 2

Committee Goals

Tonight

- Review and Prioritize Draft Strategies
- Priority Strategies
 - Discuss Various Considerations & Approaches
 - Discuss Dependencies, Feasibility, Co-benefits, Challenges
 - Develop List of Near- & Long-Term Projects and Recommendations
 - Identify Key People to Coordinate With

End of Week

- Second Priority Strategies
 - Review Various Considerations & Approaches
 - Consider Dependencies, Feasibility, Co-benefits, Challenges
 - Provide written feedback on:
 - Strategies
 - Project and Recommendation Ideas
 - Any other edits/considerations for public meeting materials

Draft Key Strategies

Strengthen the Edge (Infrastructure) – Protect the Rockaway West communities and minimize flooding by strengthening the ocean and bay edges

Power, Utilities, and Water (Infrastructure) – Strengthen all utilities and communications infrastructure to ensure endurance at all times

Expand Transportation (Infrastructure) – Improve and expand transportation networks for the communities across Rockaway West to ensure ongoing connectivity and multiple access points

Economic Sustainability – Strengthen commercial corridors to protect and sustain economic health during and after storms and to maintain overall vibrancy of the community

Connection to Water – Expand the access and opportunities presented by the water, the nucleus of the Rockaway communities

Rebuild and Protect (Housing) – Rebuild and protect all types of housing, the most important asset to the community (including single-family, mid-rise, and high-rise, renter- and owner occupied, and both regulated and market rate)

Emergency Preparedness (Community Planning) – Strengthen key corridors and intersections to protect and sustain economic health during and after storms and to enhance community vibrancy

Expand Health and Social Services (Health & Social Services) – Expand healthcare and social services in Rockaway West, especially during and after emergencies

Strategy: Strengthen the Edge



Strengthen the Edge: Initiatives

- Identify vulnerabilities in the bay wall and identify near term remediation projects where needed and feasible
- Evaluate opportunities to standardize and permanently strengthen the bay seawall
- Determine any gaps in current beachfront plans and identify short- and long-term projects to address them
- Evaluate opportunities to protect community edges adjacent to federally owned and managed areas

Strengthen the Edge: Questions

- What type of solutions would you like to consider in protecting the edge?
- What considerations are specific to Rockaway West vs. the larger region (ie bay and peninsula)?
- What are the trade-offs in considering these edge ideas?
- What is important to consider in getting across the dunes (e.g. emergency vehicles, garbage pick-up, wheelchair ramps, etc.)?
- Do you have additional ideas for ocean edge protection beyond the currently planned or implemented efforts?
- Does a wall along the National Park Service property line make sense to you?
- What else have you considered or would you like to suggest?

Approaches to strengthening the edge can look very different



Dunes



Sea Walls



Constructed Wetlands



Artificial Reefs



Flood Walls



Groins



Bulkheads



Constructed Breakwater Islands



Revetments



Levees

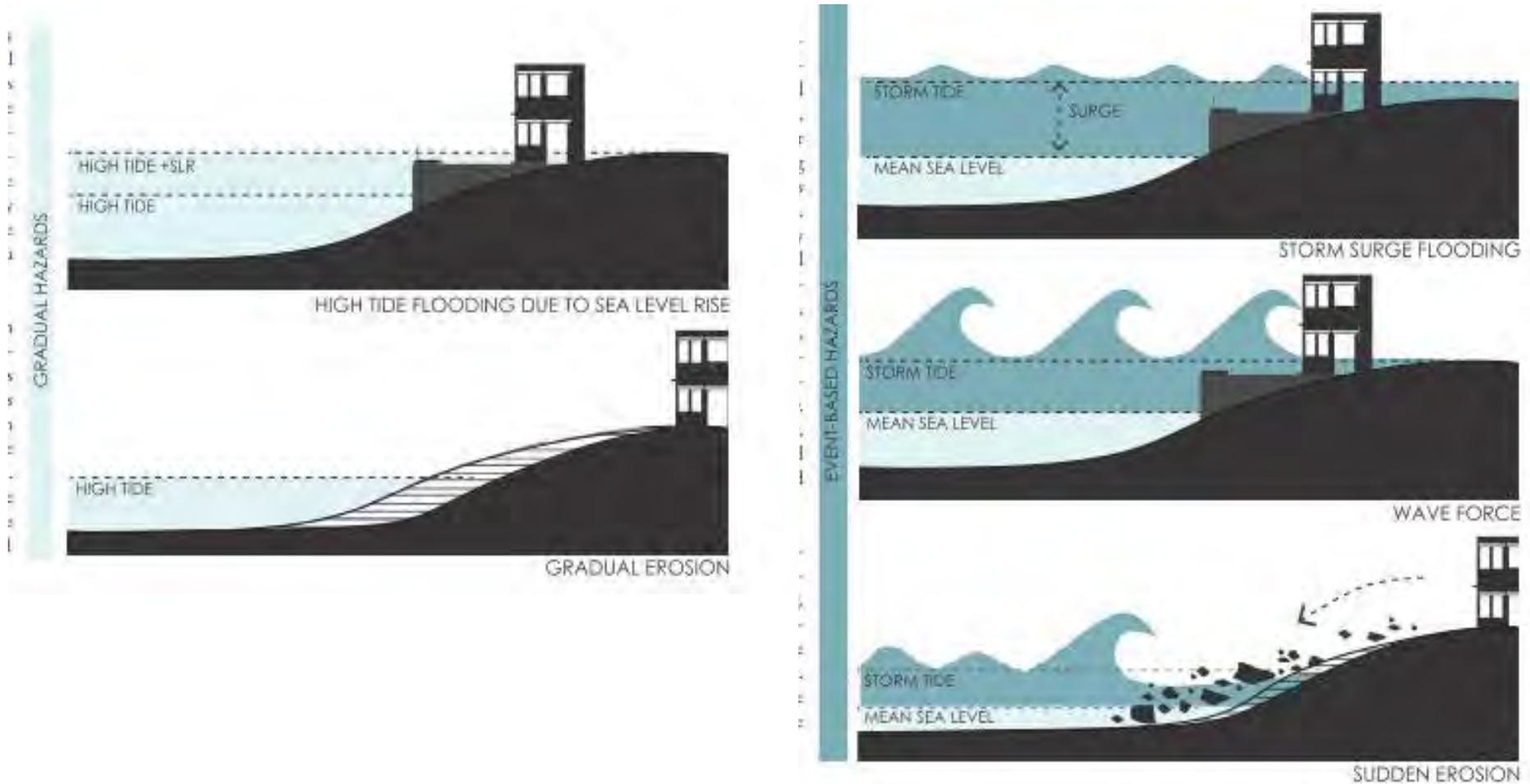


Breakwaters



Living Shorelines

What are we strengthening against?

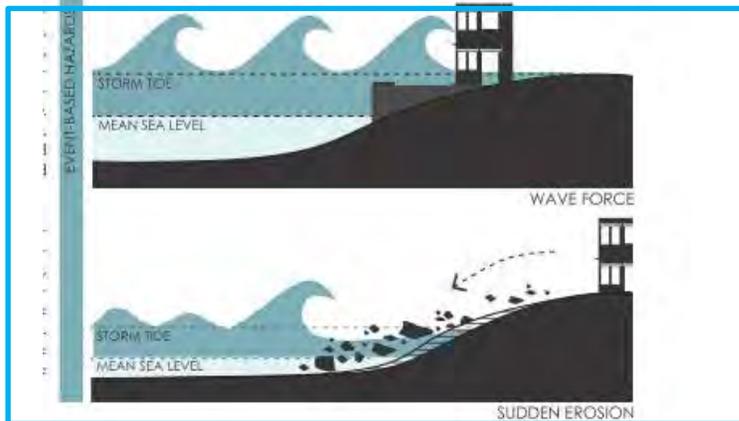


Source: New York City Dpt. Of City Planning, "Urban Waterfront Adaptive Strategies" (2013)

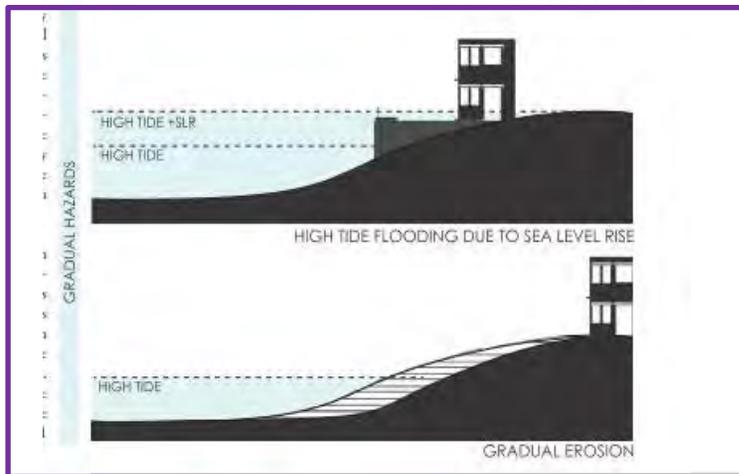
What causes these hazards?



Storm Surge



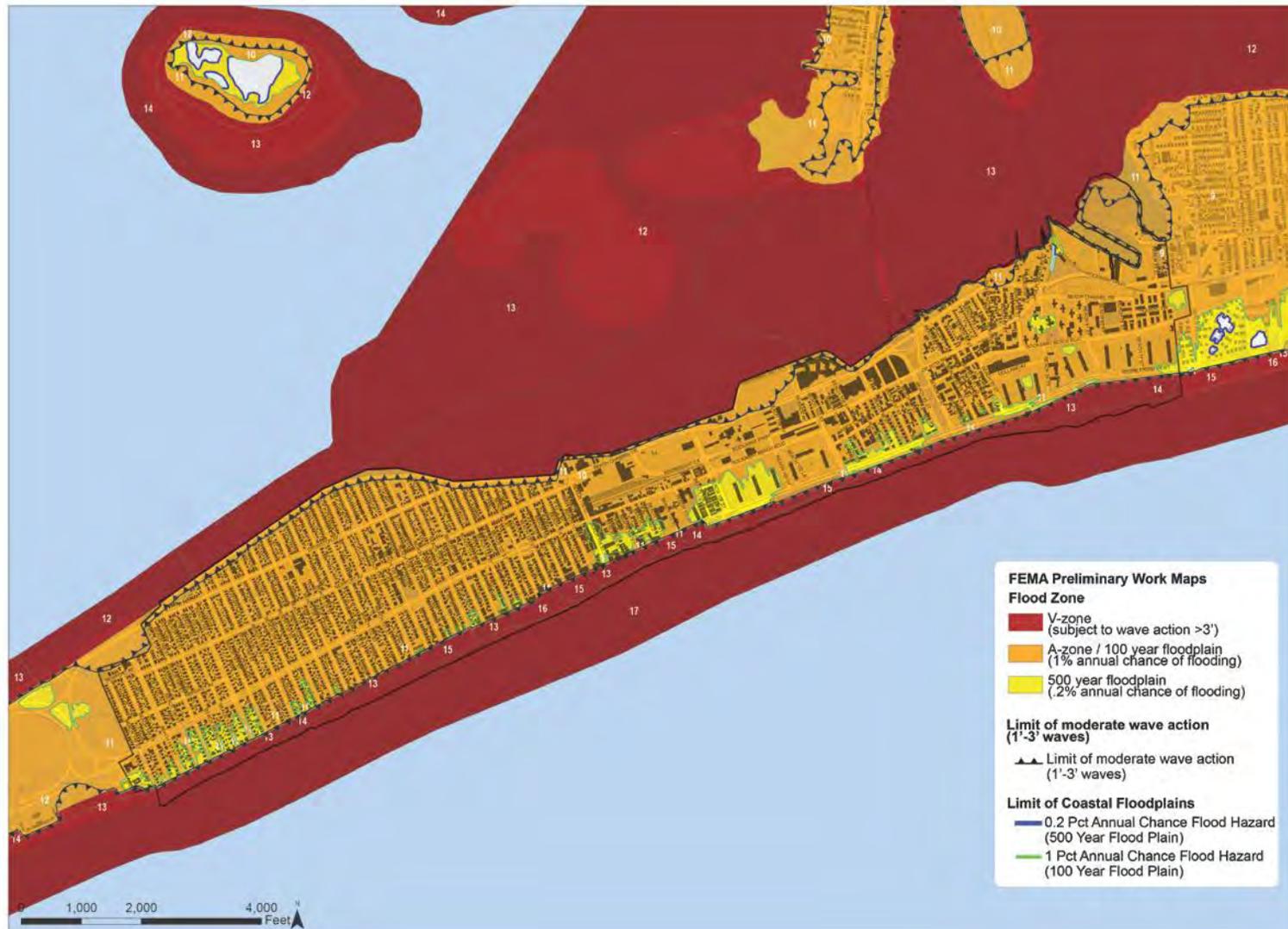
Wave Action / Energy



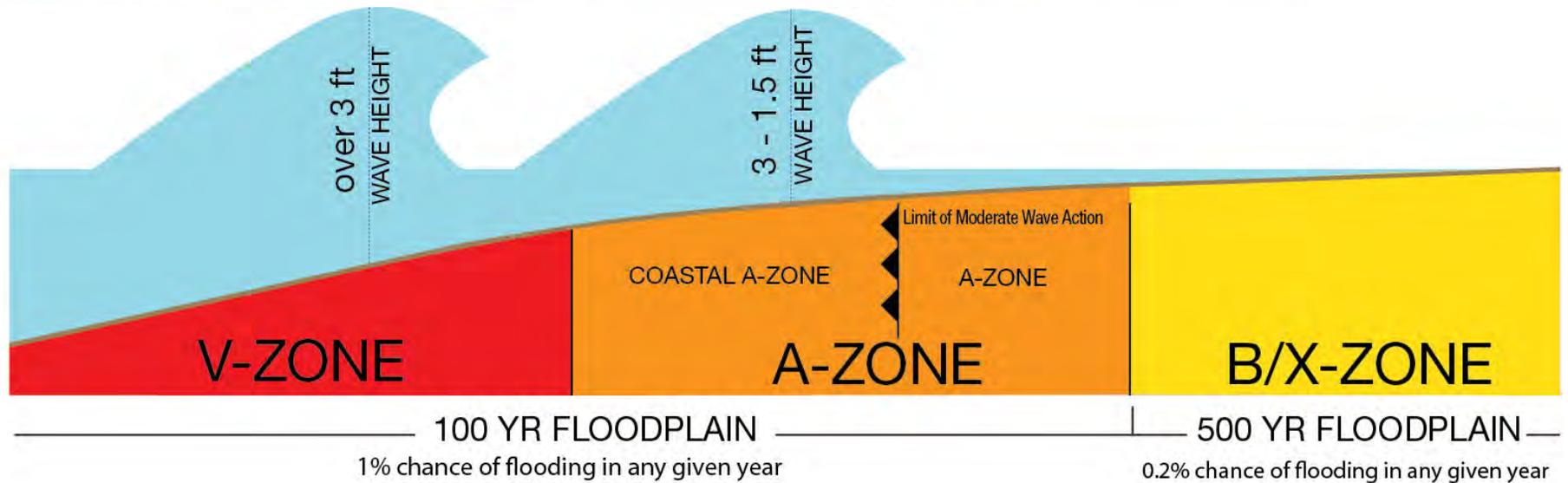
High Tides, Sea Level Rise, Water Currents

Image Source: New York City Dpt. Of City Planning, “Urban Waterfront Adaptive Strategies” (2013)

Potential Flooding: FEMA Preliminary Work Maps



FEMA Preliminary Work Maps: How to Read the Map



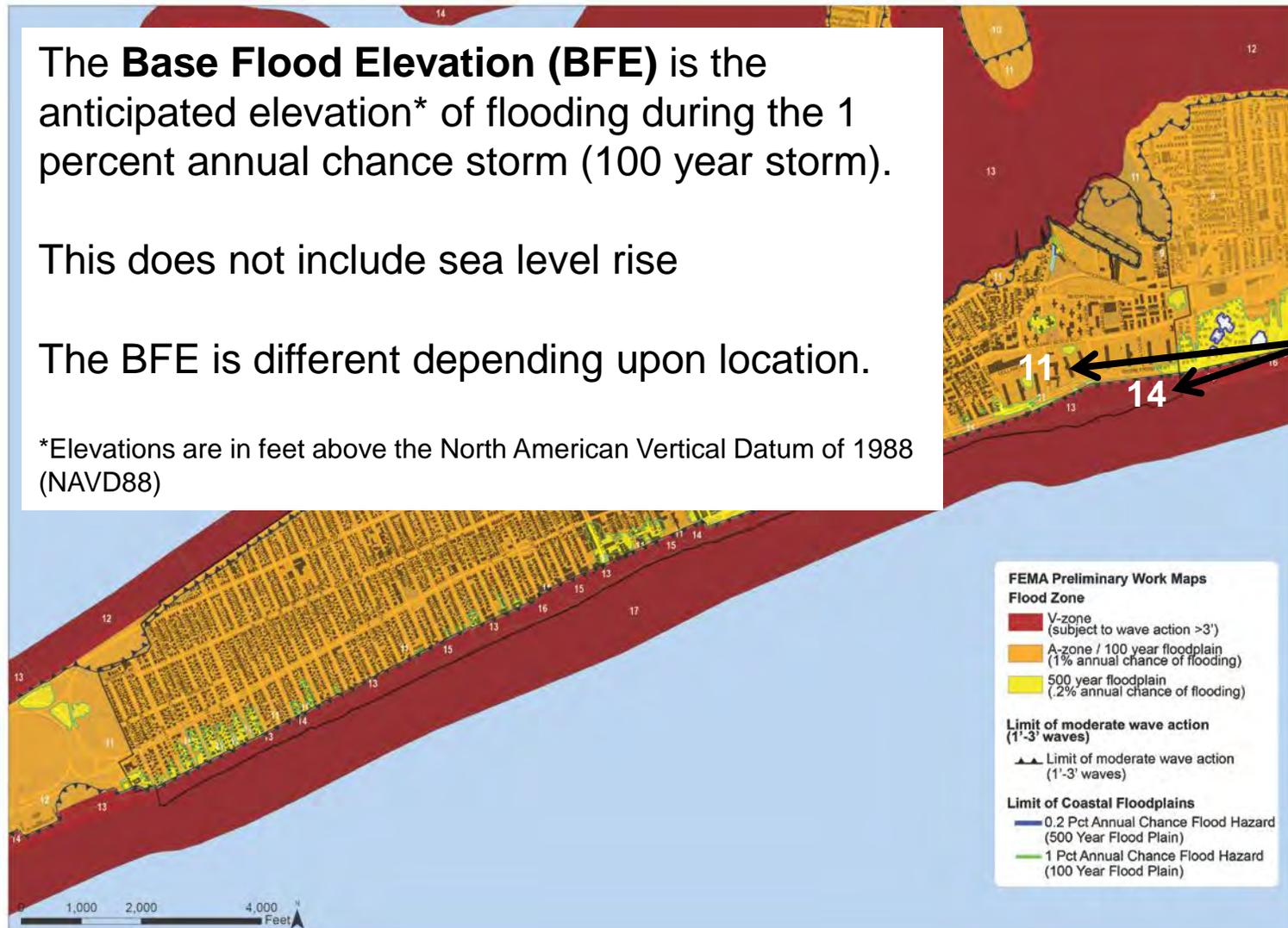
What does the BFE mean?

The **Base Flood Elevation (BFE)** is the anticipated elevation* of flooding during the 1 percent annual chance storm (100 year storm).

This does not include sea level rise

The BFE is different depending upon location.

*Elevations are in feet above the North American Vertical Datum of 1988 (NAVD88)

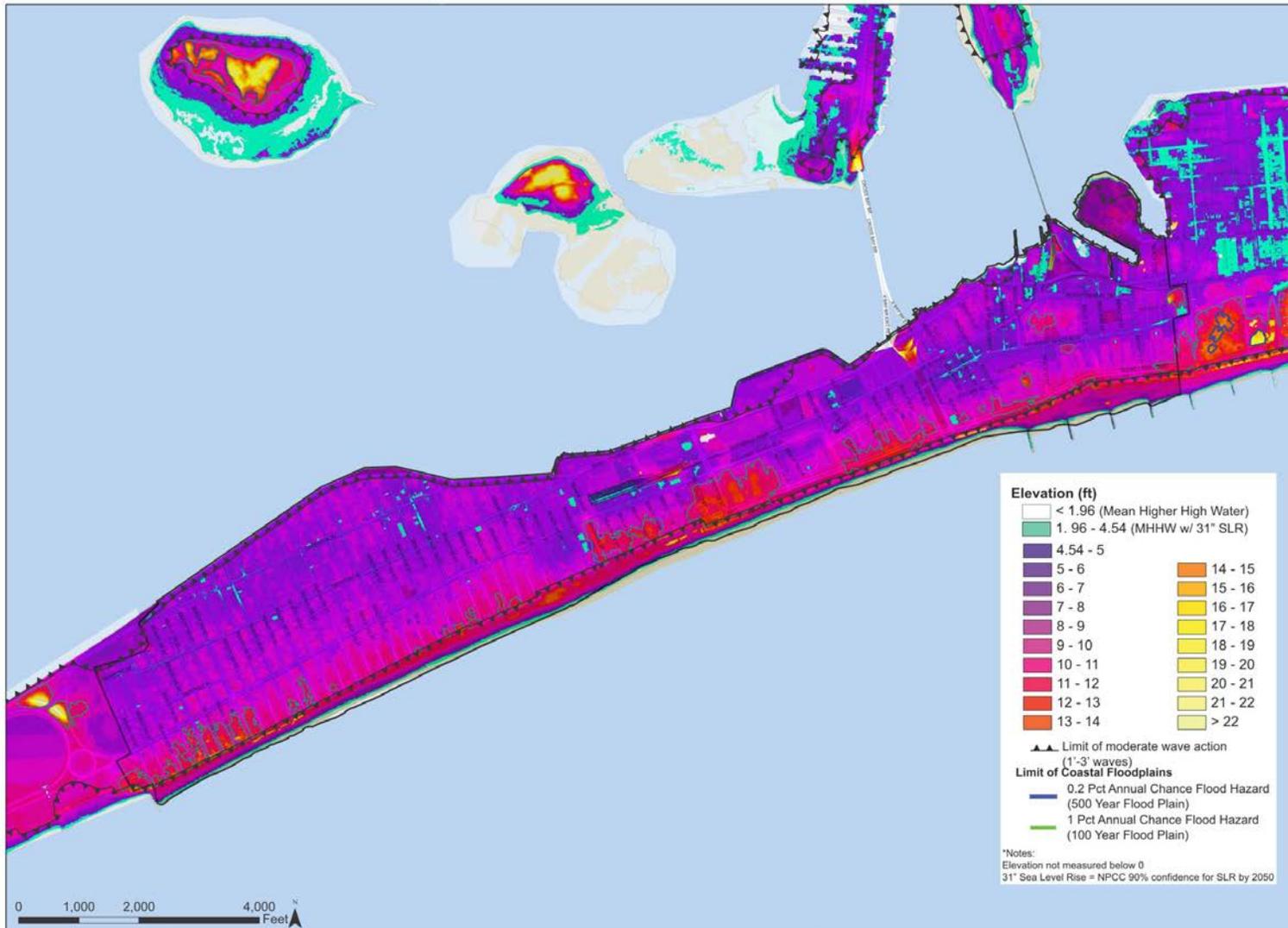


**Base
Flood
Elevation
(BFE)**

Understanding the Risk From Surge



High Tides and Sea Level Rise



Current Conditions: Edge Type



Current Conditions: Coastal Geomorphology Categories



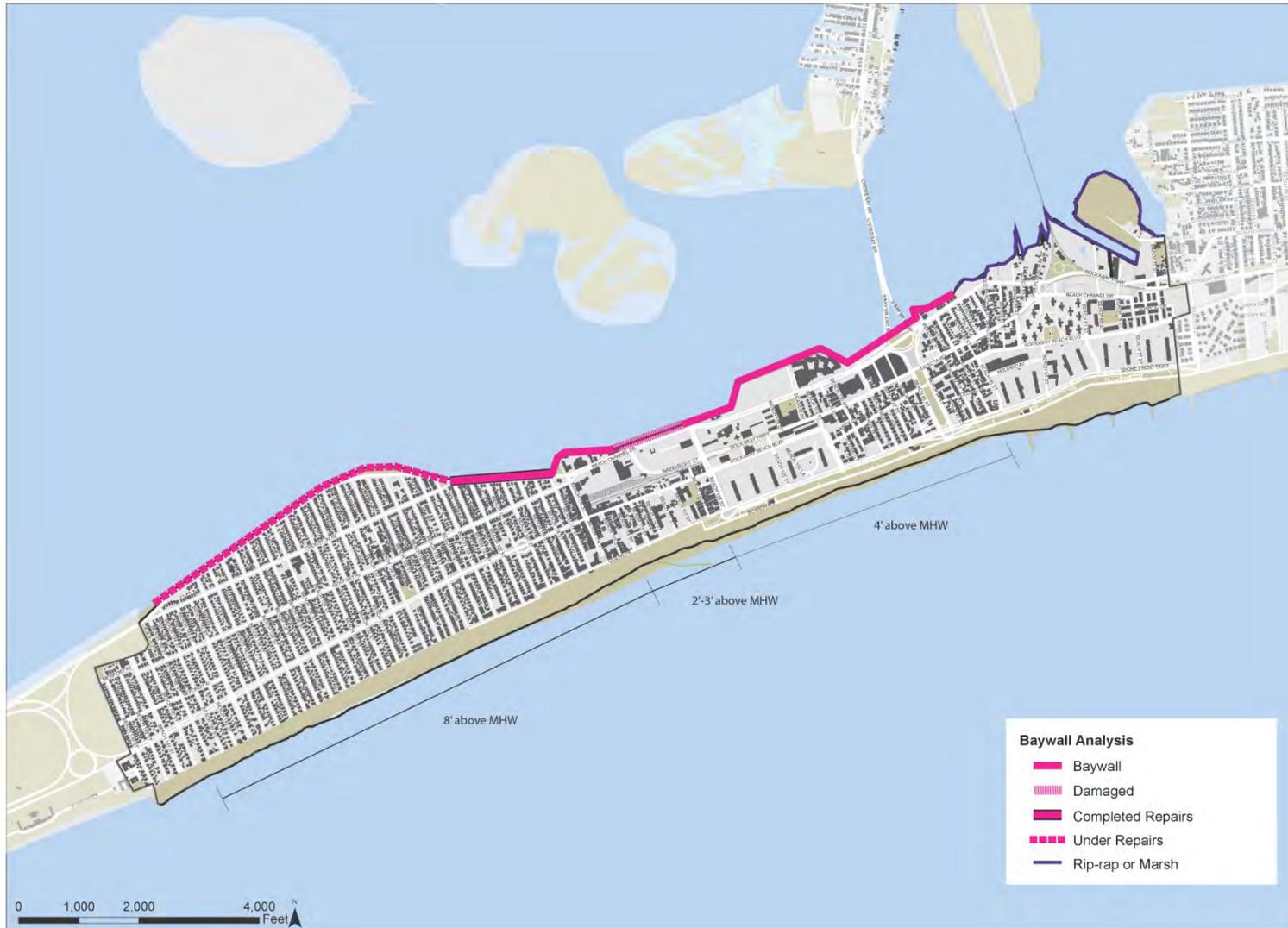
- Oceanfront Beaches**
Glacial outwash plains, High fetch,
Low elevation / gradual slopes,
Unreinforced shorelines, Fine sediment
- Coastal Marshes**
Glacial outwash plains, Low fetch,
Low elevation / gradual slopes,
Unreinforced shorelines, Fine sediment
- Hardened Sheltered Bay Plains**
Glacial outwash plains, Low fetch,
Low elevation / gradual slopes,
Reinforced shorelines, Fine sediment

GEOMORPHOLOGY CATEGORIES		DEGREE OF EXPOSURE TO COASTAL HAZARDS				
		EVENT BASED			GRADUAL	
		Storm Surge	Wave Action	Sudden Erosion	Sea Level Rise	Erosion
1	Oceanfront Beaches	●	●	●	●	●
3	Coastal Marshes	●	○	○	●	●
4	Hardened Sheltered Bay Plains	●	○	○	●	○

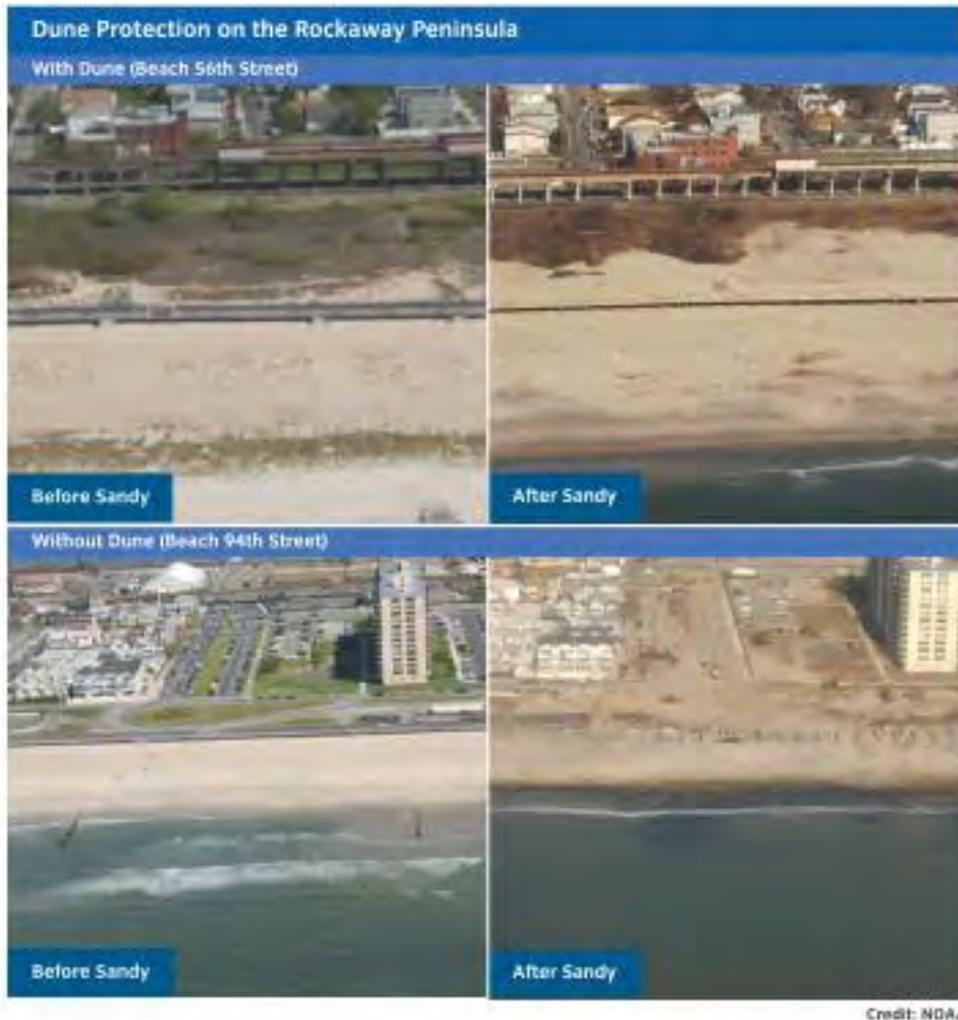
Based on the mapping of geologic landforms, shoreline condition, and wave exposure, nine geomorphology types emerged as representative of the range of factors present in New York City. Each type is a composite of these three factors. These types can be analyzed for their degree of exposure to sudden and gradual coastal hazards.

Source: New York City Dpt. Of City Planning, "Urban Waterfront Adaptive Strategies" (2013)

Current Conditions: Existing Coastal Protection – Bay Side



Current Conditions: Existing Coastal Protection – Ocean Side



- “Areas of the Rockaway Peninsula with established dunes suffered substantially less damage and less sand migration into neighborhoods than areas without them.”
 - NYC, “A Stronger, More Resilient New York.”

Current Conditions: Ownership of the edge

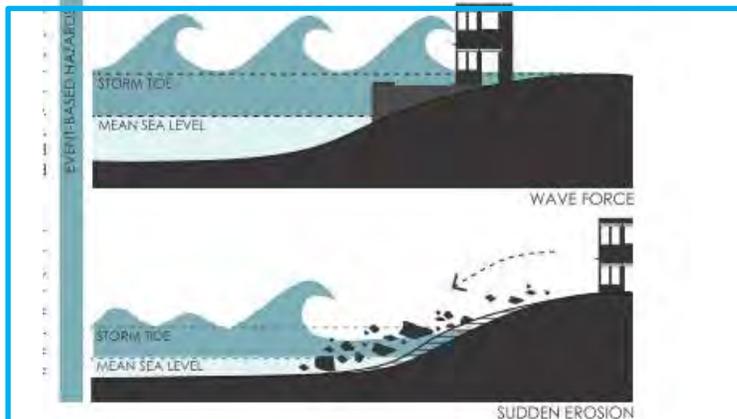


What do we do? Types of Strategies



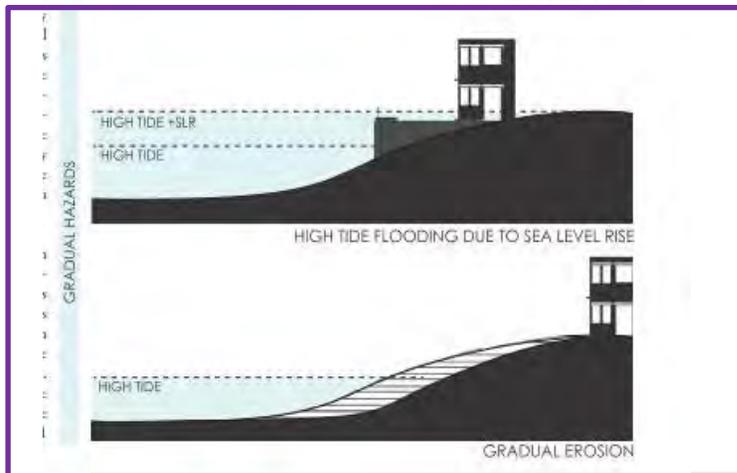
Storm Surge

Protect against storm surge



Wave Action

Reduce wave energy / Minimize upland wave zones



High Tides, Sea Level Rise, Water Currents

Raise coastal edge elevations

Image Source: New York City Dpt. Of City Planning, “Urban Waterfront Adaptive Strategies” (2013)

Strategies to Protect Against Storm Surge

Function: (NYC categories)	Protect against storm surge
Protects Against:	<i>Storm surge (structures or interventions that block surge)</i>

Representative Strategies

Bayside – Regional	Surge Barrier at Mouth of Bay
Bayside – Local	Seawalls, floodwalls, integrated flood protection, levees
Oceanside	Seawalls, floodwalls, integrated flood protection, levees, Reinforced Dunes



Sea Walls



Levees



Flood Walls

Strategies to Reduce Wave Action

Function: (NYC categories)	Minimize upland wave zones
Protects Against:	<i>Wave action / wave energy (can also reduce inland extent of coastal flooding some instances)</i>
Representative Strategies	
Bayside – Regional	Bay-wide restoration projects
Bayside – Local	Site-scale wetland restoration, living shorelines, breakwaters, artificial reefs
Oceanside	Dunes, Groins, breakwaters, revetments



Constructed Wetlands



Reefs



Groins



Constructed Breakwater Islands

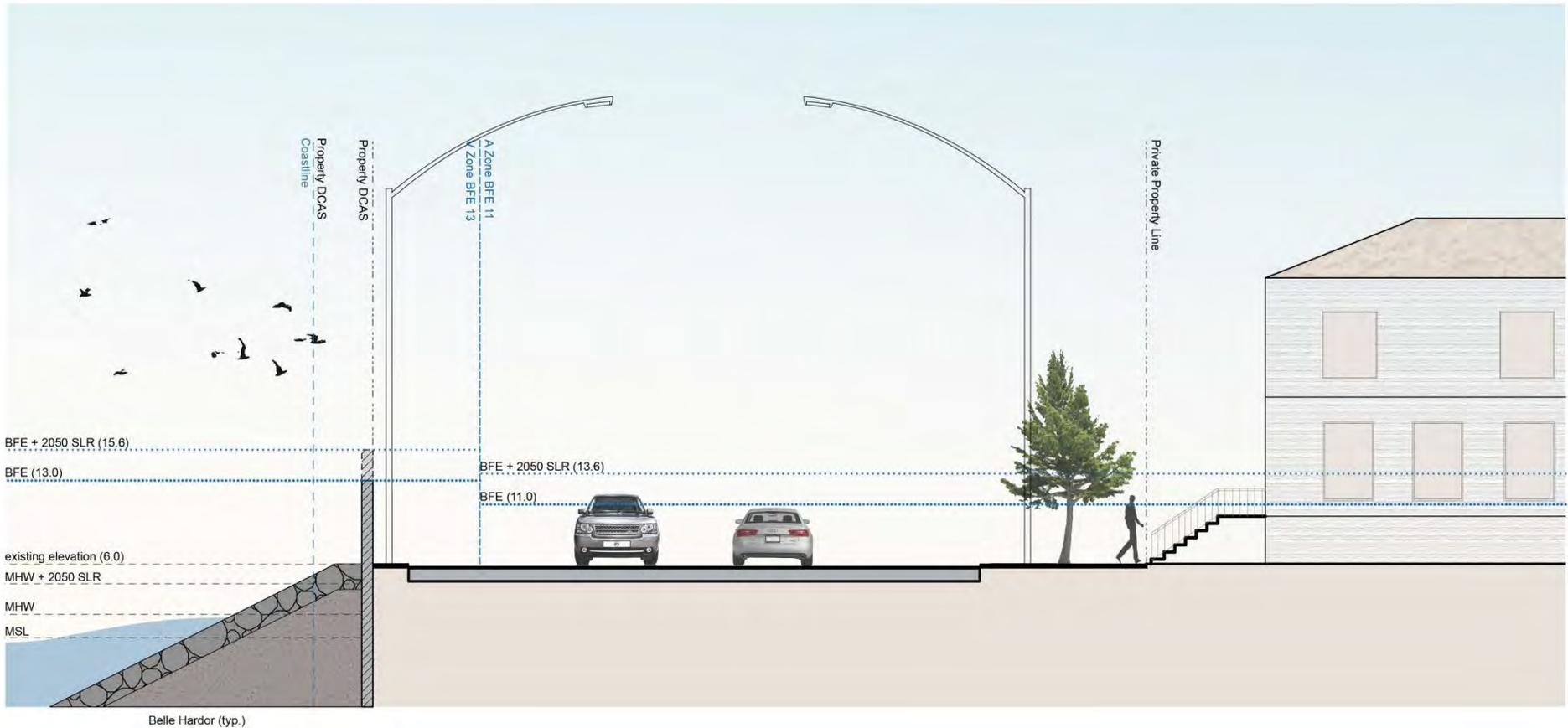


Breakwaters



Living Shorelines

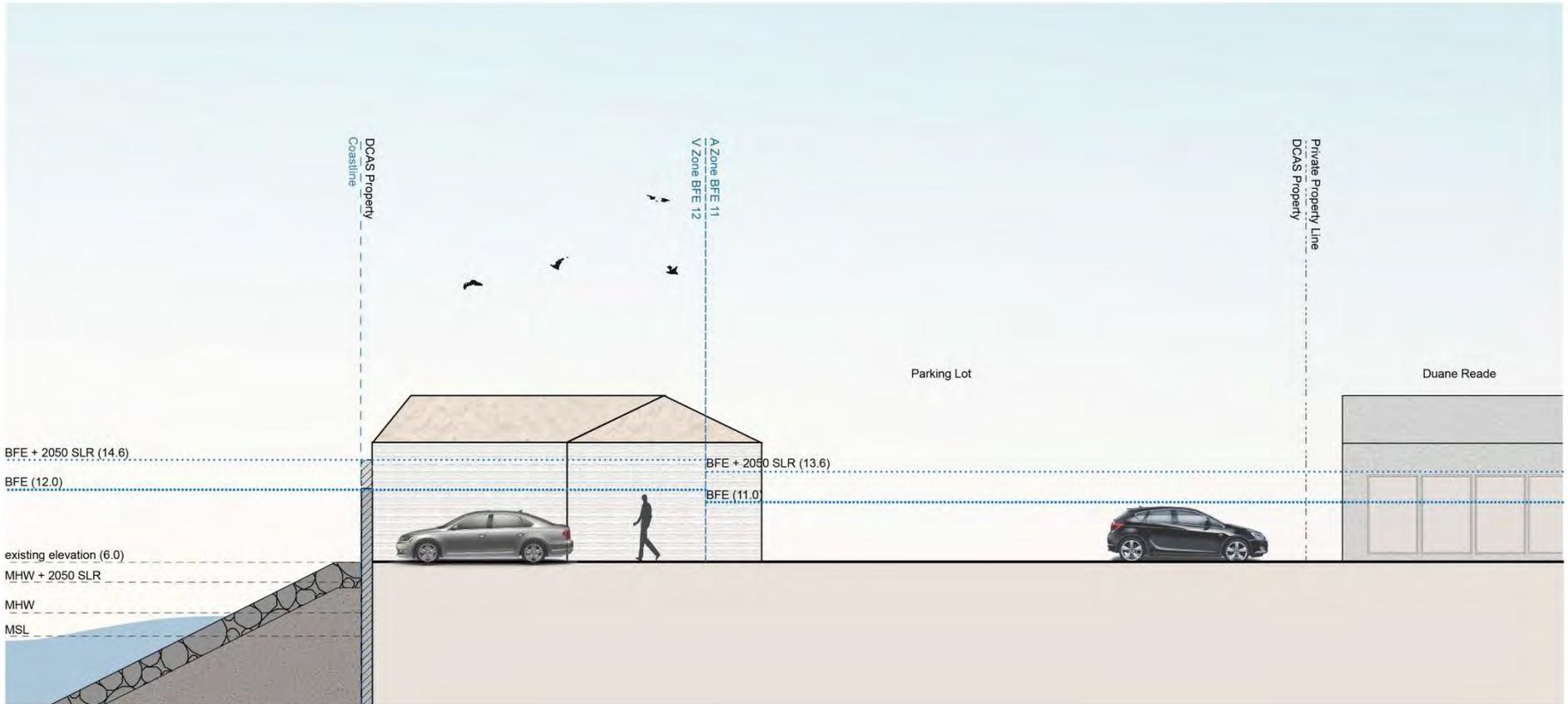
Section of Raised Baywall



Belle Harbor (typ.)

Illustration of concept for discussion purposes only

Section of Raised Baywall



Beach 116th St.

Illustration of concept for discussion purposes only

Section of Raised Baywall



Beach 108th St.

Illustration of concept for discussion purposes only

Section of Raised Baywall

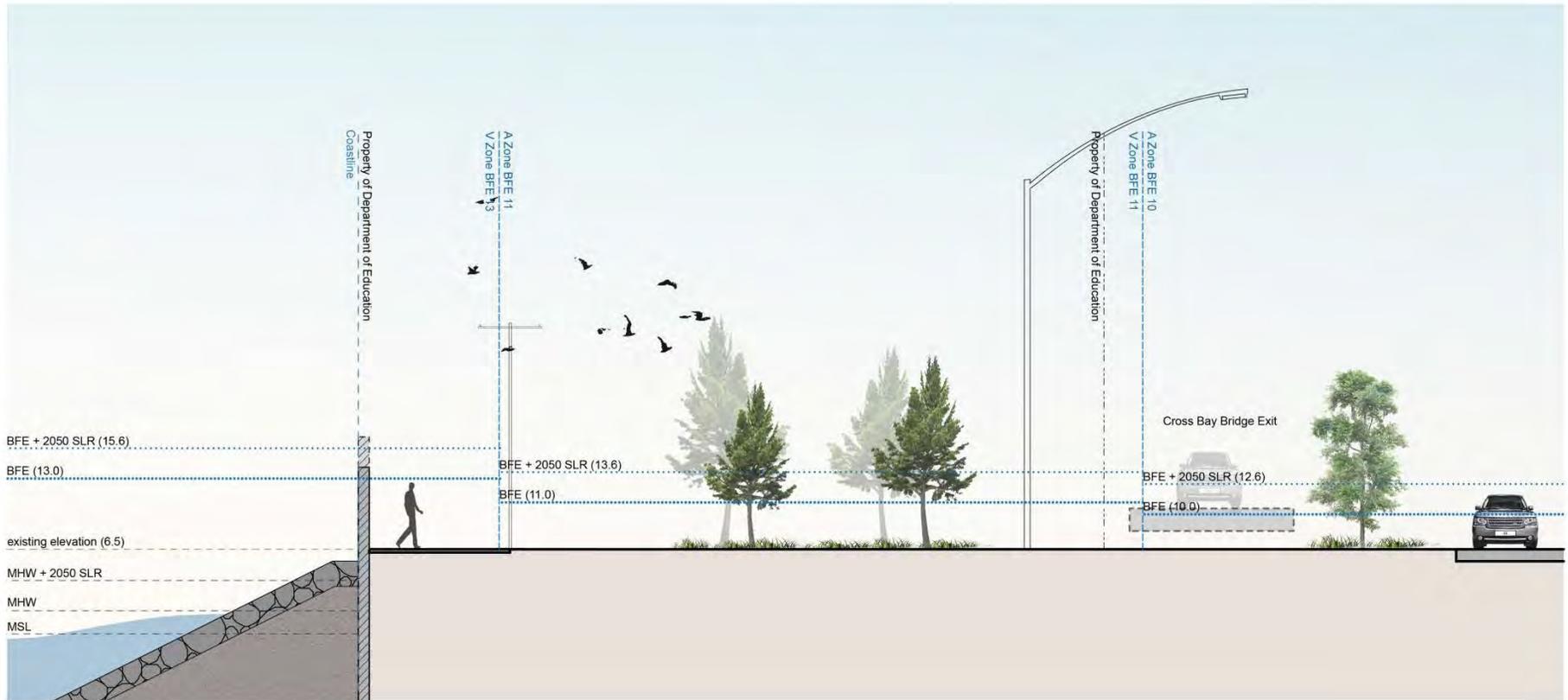


Illustration of concept for discussion purposes only

Beach 98th St.

Section of Raised Baywall



Illustration of concept for discussion purposes only

Beach 90th St.

Strategies to Raise Coastal Edge Elevations

Function: (NYC categories)	Increase Coastal Edge Elevations
Protects Against:	<i>Sea level rise, high tides, and smaller frequent coastal flooding</i>
Representative Strategies	
Bayside – Regional	
Bayside – Local	Bulkheads, revetments
Oceanside	Beach Nourishment



Bulkheads



Revetments

What is being done already?

Project / study name	Agency	Anticipated Completion
<p>Jamaica Bay Feasibility Study Reevaluation of ecological restoration projects for potential coastal protection benefit</p>	USACE	July 2014 (draft report)
<p>East Rockaway to Rockaway Inlet Reformulation Study Phase 1 – Ocean side - Beach Renourishment & additional erosion control Phase 2 – Bay Side -</p>	UCACE	Phase 1: October 2014 (draft) Phase 2: October 2015 (draft)
<p>Rockaway Boardwalk NYCDPR has developed a plan to rebuild the boardwalk in concrete with a bulkhead that is NOT wave-resistant</p>	NYC DPR	
<p>Atlantic Side Beach Dune From Beach 19 to Beach 149, working with the city to create a dune (ongoing) From Rockaway East Inlet to Ft. Tilden: USACE constructing 200' beach berm + 16' sand dune. City will then cover with burlap and plantings. This will be complete by Memorial Day 2014</p>	USACE & NYC DPR	Beach 19 to Beach 149 ongoing Rockaway Inlet to Ft. Tilden: Memorial Day 2014

Rockaway Peninsula and Jamaica Bay Coastal Protection Projects



Strengthening the Edge: Potential Strategies Rockaway West

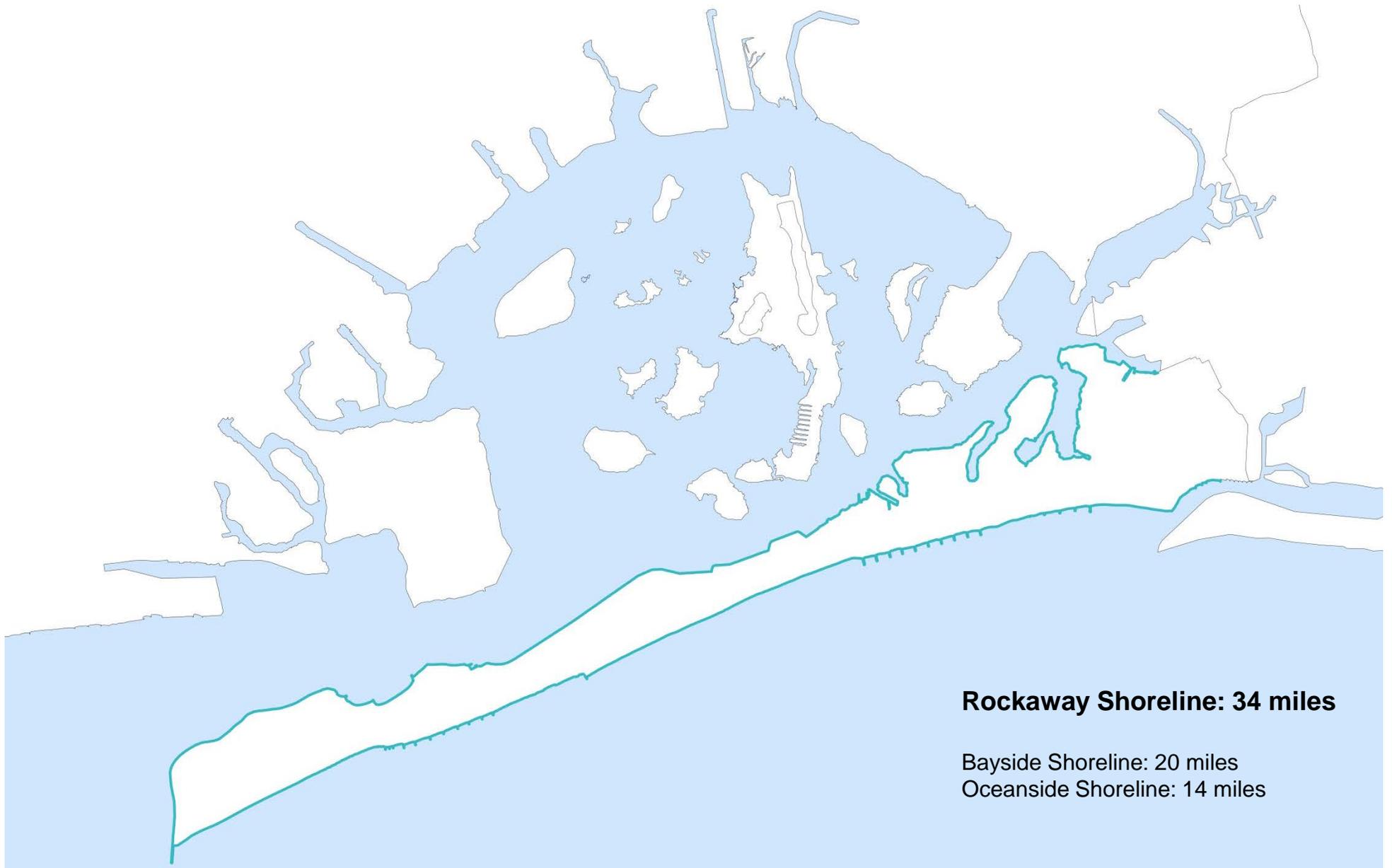
- Complete protection against surge: Keep the Water Out
 - Continuous engineered edge
 - Regional Surge Barriers
 - City-wide Surge Barriers
- Attenuate waves and potentially reduce heights of surge
 - In-water strategies
 - Combined strategies
- Reduce vulnerability to flooding from high tides and sea level rise
 - Raise bulkheads, repair existing seawalls and bulkheads

All of the above can and should be combined with site / building specific resiliency / flood protection strategies

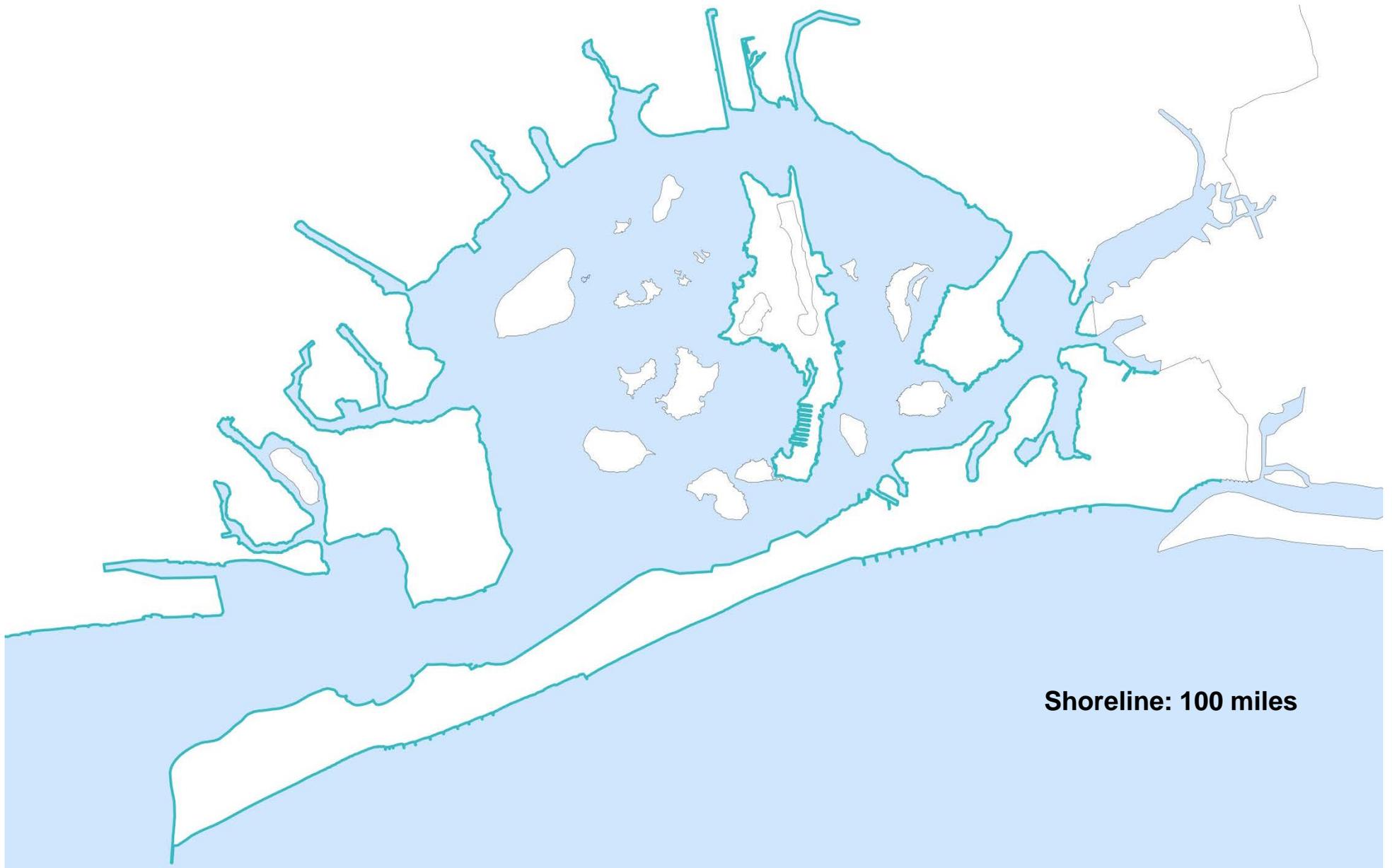
To completely keep out the 100 year storm surge,
this is what we are up against ...



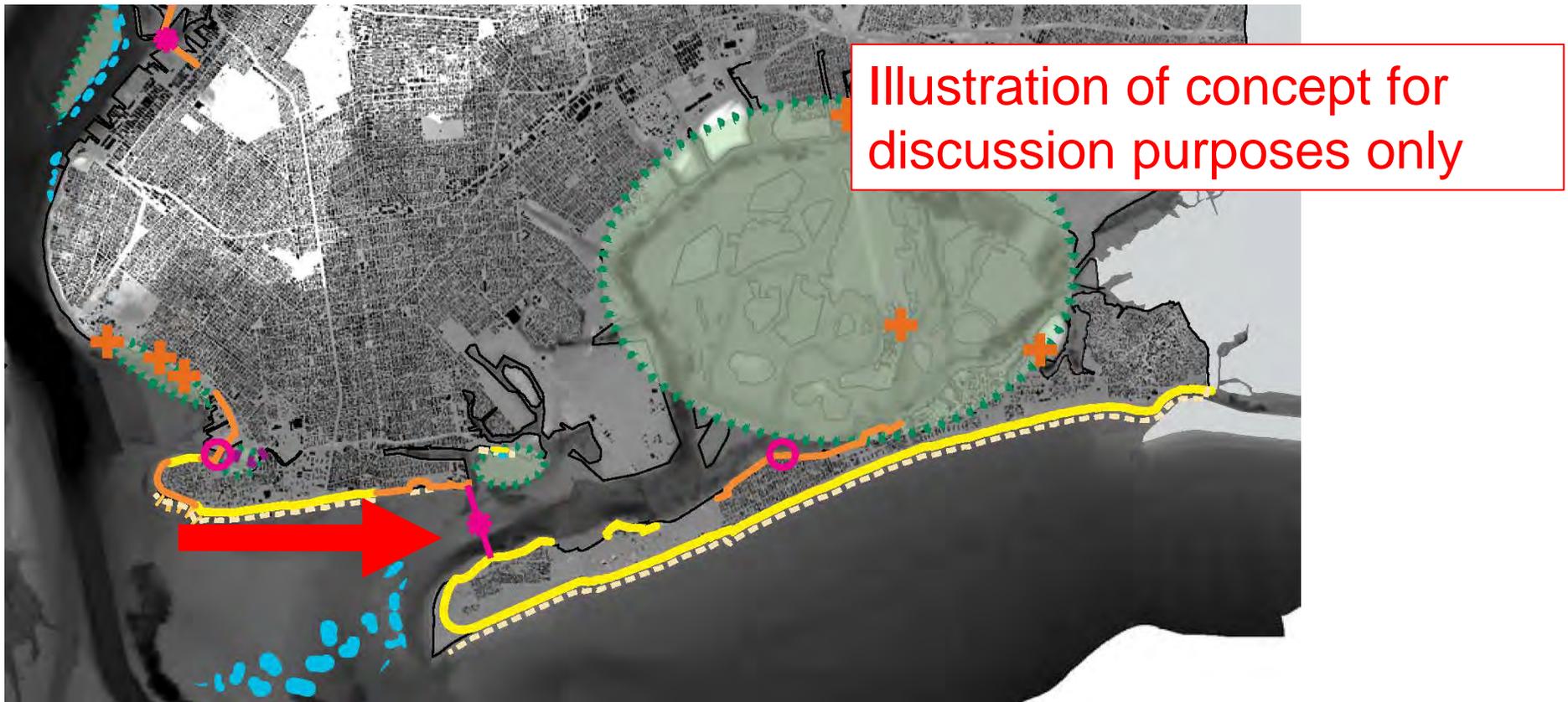
Regional Strategies Surge Protection: Rockaway Peninsula



Regional Strategies Surge Protection: Jamaica Bay



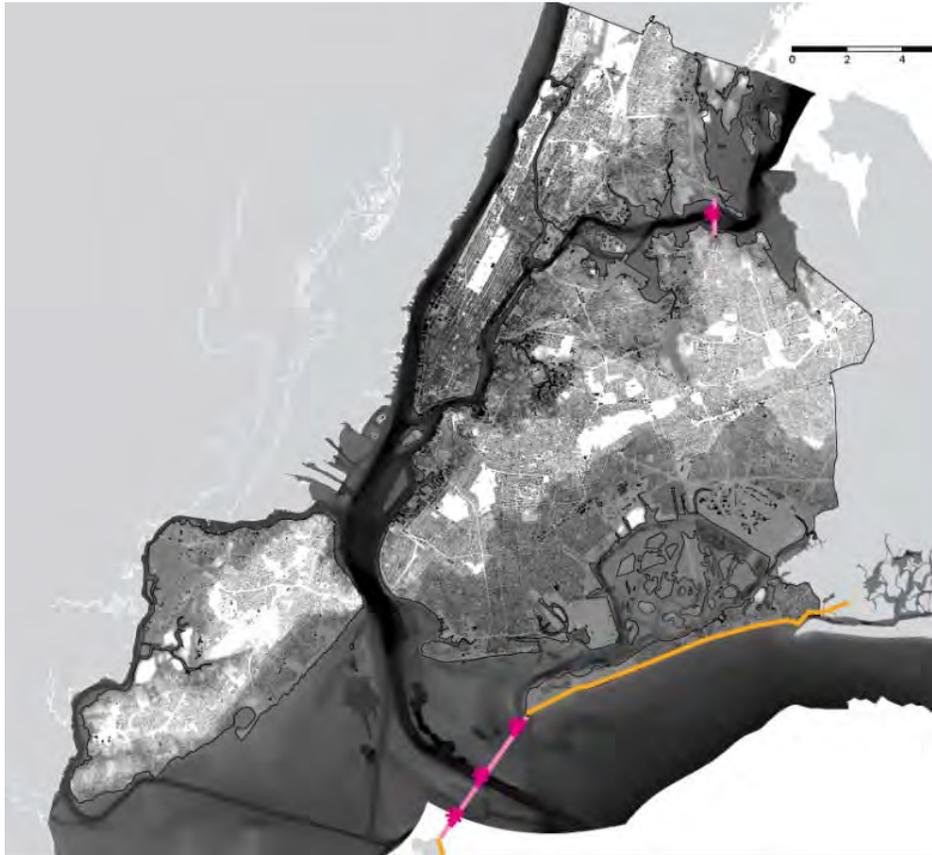
Regional Strategies Surge Protection: Jamaica Bay Surge Barrier



NYC “A Stronger, More Resilient New York” Comprehensive Coastal Protection Plan

“A Stronger, More Resilient New York” South Queens Initiative #1:
“Call for USACE to develop an implementation plan to mitigate inundation risks through Rockaway Inlet, exploring Surge Barrier and alternative measures”

Regional Surge Protection: City-wide surge barriers



Sandy-hook to rockaway surge barrier (including connecting levees / walls in NY and NJ) + Surge Barrier at Throgs Neck

- Various options for city-wide surge barriers have been studied in the past
- Pros
 - Provides Harbor-wide protection (to a point)
- Concerns:
 - Extremely expensive: \$20-25 Billion to construct with ongoing maintenance costs
 - Requires extensive coordination among, city, state, and federal agencies
 - Likely to have significant negative environmental and hydrologic impacts
 - Would still require large-scale coastal protection infrastructure on the ocean-side of the Rockaways

Source: A Stronger, More Resilient New York

Complete protection against surge

A coordinated approach that requires each agency, government entity, and private owners to implement a continuous edge protection strategy.

PROS

- Uses multiple methods tailored to ownership and geomorphological condition, and other considerations
- Provides comprehensive protection if fully implemented

CONS

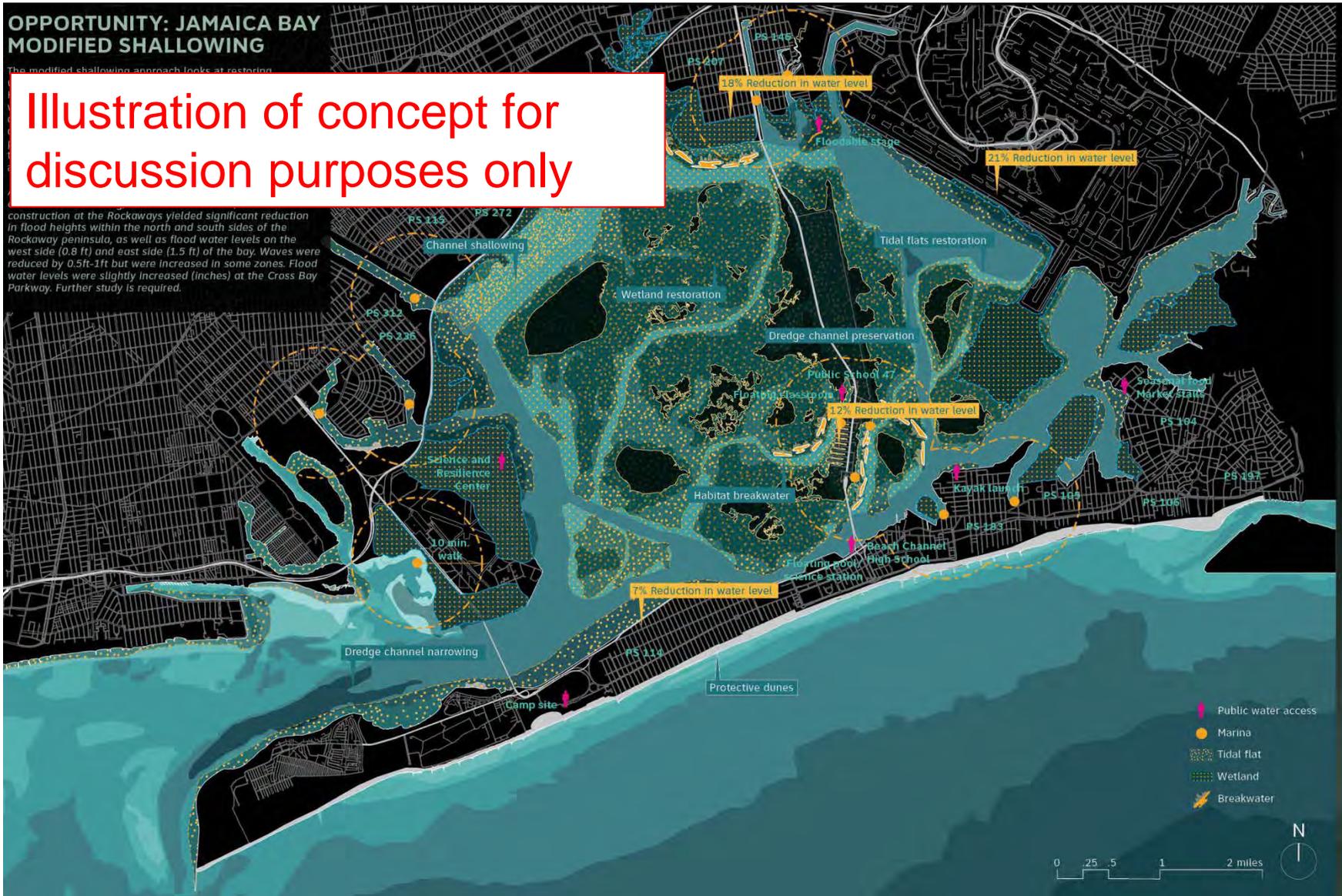
- Requires every owner and/or entity to coordinate if protection is to be comprehensive
- Unlikely to be implemented in the short term
- Very costly

Strategies to Reduce wave energy and extent of surge



- The Ocean Side:
 - Highly exposed to heavy wave action
 - Dune have the potential to provide protection against damaging wave action
- The Bay Side:
 - Less exposed to wave action than the ocean
 - Some storms can create damaging waves in the bay and regular wave action can stress shoreline protection features
 - Locally, breakwaters and wetlands have potential to create some reduction in wave activity
 - Larger scale application of wave reducing interventions, such as large scale wetland restoration may be able to reduce surge as well as waves in the bay.

Regional Combined Strategies: Large Scale Habitat Restoration in Jamaica Bay



Coastal Protection is ONE piece of the solution, Focus on Reducing Risk



Strategy: Strengthen Power, Utilities, and Water



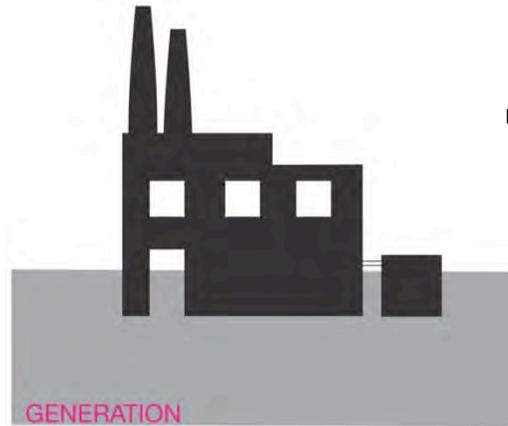
Infrastructure/Utilities/Utilities/Water: Initiatives

- Ensure the wastewater treatment plant is safe and fully operational in the near-term, especially in an emergency, and is upgraded in a resilient, sustainable way to accommodate the increased population, and additional global changes in the long-term
- Install backflow valves along the bay side to prevent overflow and contamination
- Harden LIPA substation
- Implement back-up 'hard-wired' communications networks to serve as redundant system from mobile services
- Implement emergency communication system
- Create incentive program for implementing alternative energy sources across the community (e.g. solar, wind) that could provide back-up power in emergencies
- Implement green infrastructure projects (to mitigate stormwater runoff and sewer overflows)

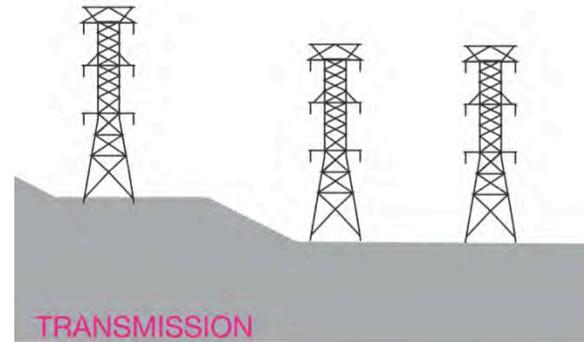
Infrastructure/Utilities/Utilities/Water: Questions

- What do you think the greatest utility issues are for the community?
- Where are the drainage or flooding issues and how/when do they occur? How does the community currently content with them?
- Would you consider alternate sources of energy? (e.g. solar-farms in dunes or on public buildings; wind farms, etc.)? Especially if they provide back-up emergency power or increase revenue to the community?
- What are regional approaches you would consider or think are worth pursuing?
- What else have you considered or would you like to suggest?

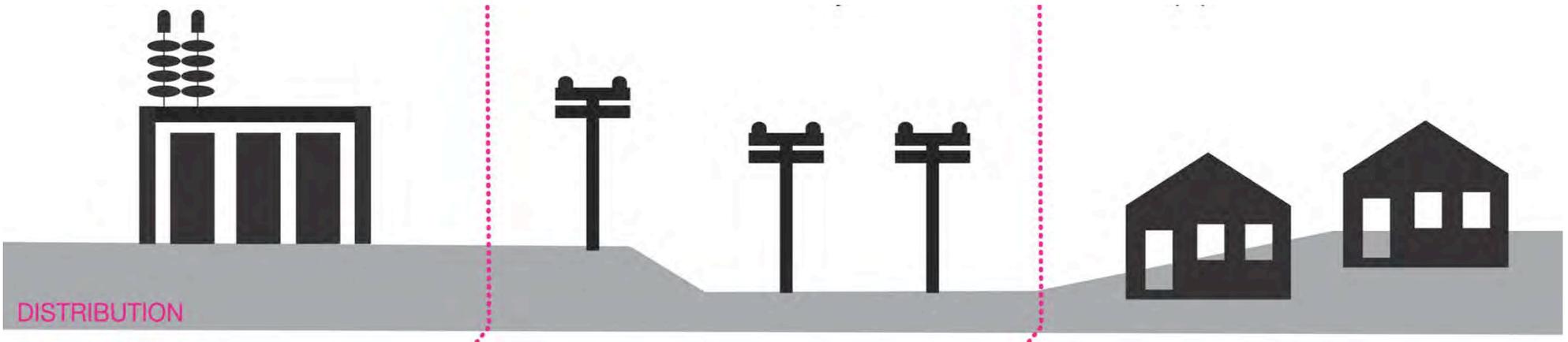
How the System Works: Generation, Transmission, Distribution



- Plants generate electricity



- High-voltage transmission lines carry electricity long distances



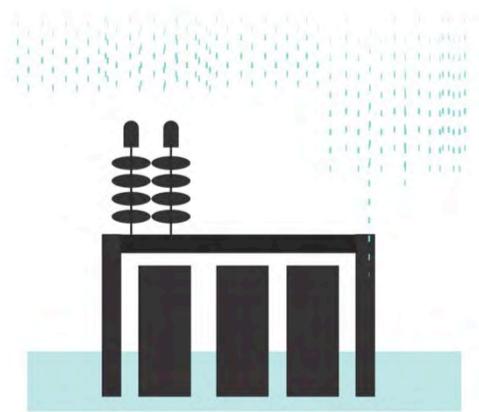
- Substations decrease voltage levels

- Underground or overhead feeder lines carry electricity to the end user

- Service lines connect to electrical equipment in homes and businesses

What Happened in Sandy

Most electrical outages during Sandy were caused by damage to the electricity distribution system



- All four LIPA area substations knocked out by seawater from storm surge.

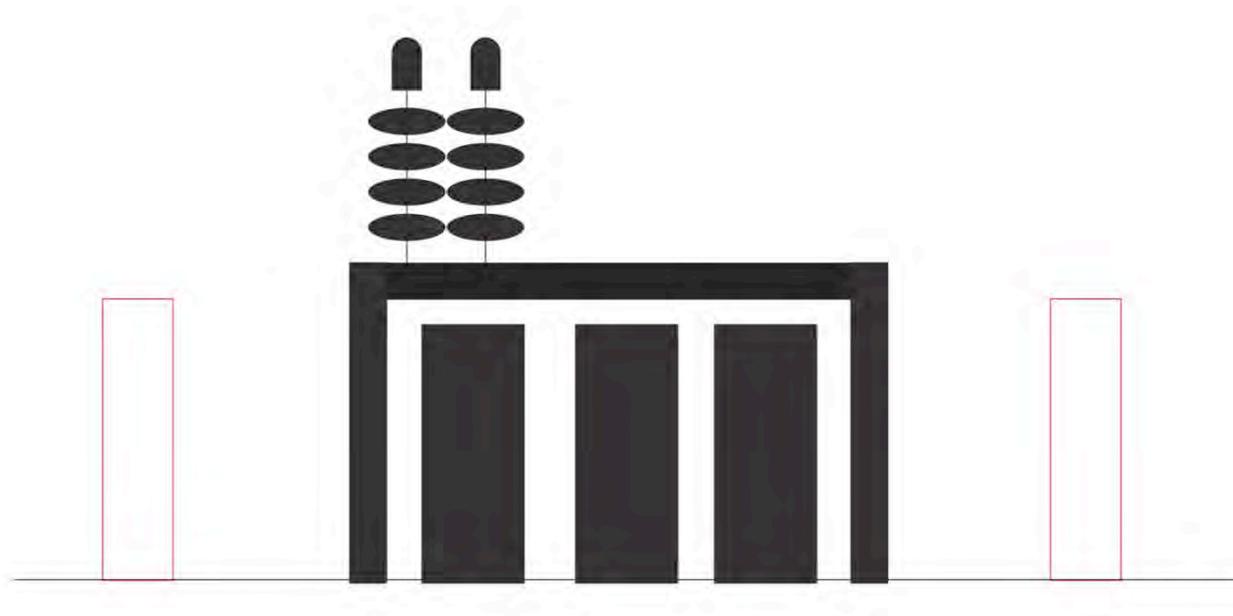


- Toppled trees and intense winds damaged overhead power lines.



- Individual household/apartment building equipment was flooded from seawater.

Potential Strategies: Protect Distribution System



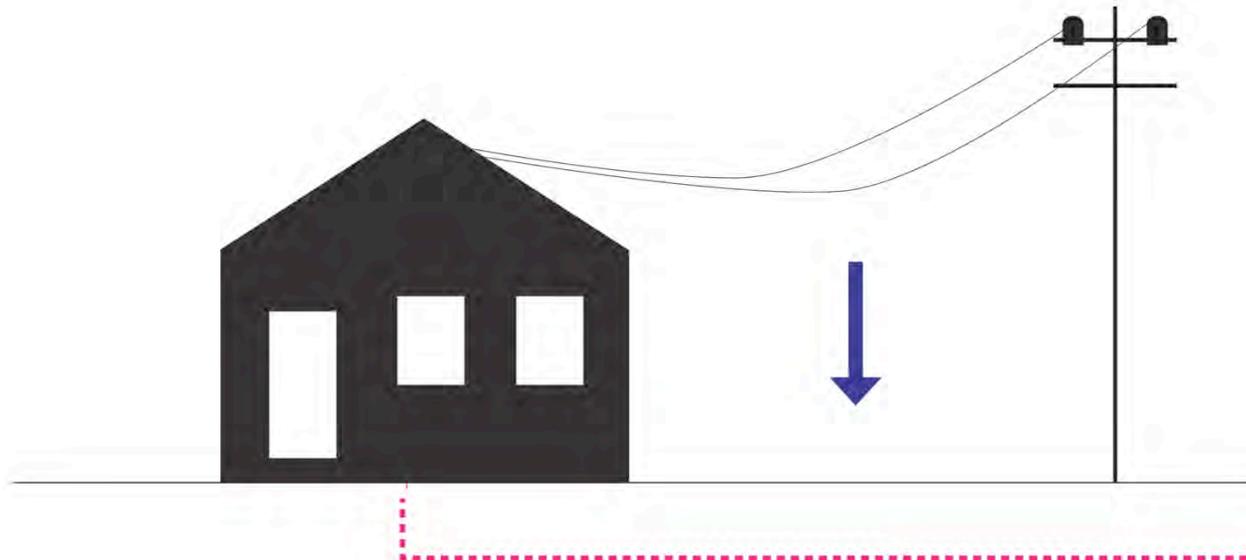
LIPA has made temporary repairs and identified long-term mitigation and permanent projects for the four area substations.

Protect substations from future flood damage

- Floodwalls to protect perimeters
- Raise equipment
- Install backup generators, flood sensors, submersible equipment, etc.
- Install backup connections to be ready for temporary mobile substations

Illustration of concept for discussion purposes only

Potential Strategies: Protect Distribution System

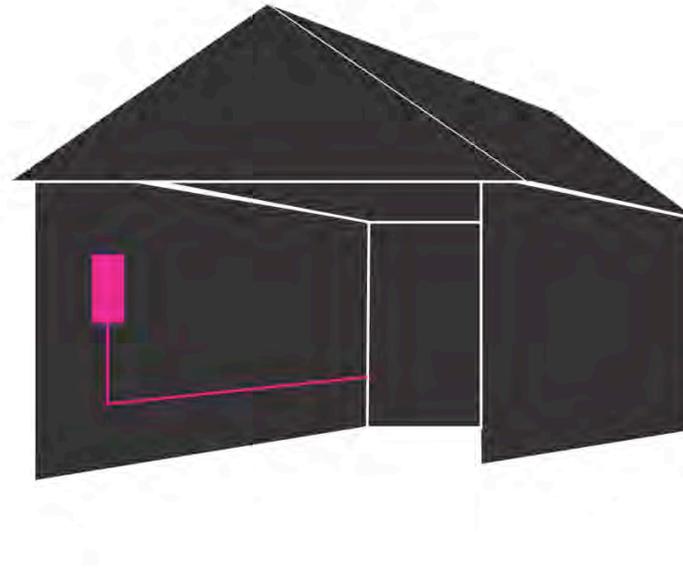


Protect service lines

- Strengthen/relocate power lines
- Proper tree maintenance
- Relocate some/all of system underground
- Install smart-grid technologies to reduce number of citizens affected if/when powerlines go down

Illustration of concept for discussion purposes only

Potential Strategies: Protect Distribution System



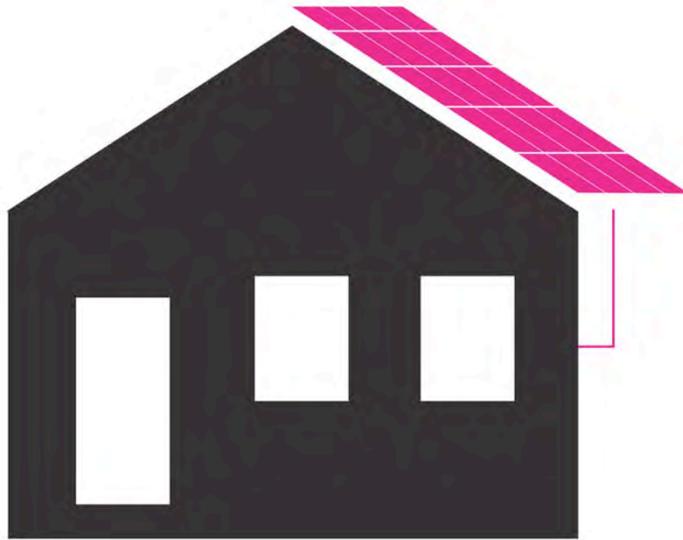
Protect home equipment

- Get it out of harm's way
 - Raise switches, sockets, breakers, and wiring
- Make it floodable
 - Replace with submersible equipment

**Illustration of concept for
discussion purposes only**

Potential Strategies: Independent Energy Sources

SOLAR



Components

- *Panel for generation*
- *Battery for storage and smoothing fluctuation*
- *Connection to grid*
- *Smart inverters*

Illustration of concept for discussion purposes only

- Functions when grid goes out
- Retains benefit of using grid power during normal operations
- Panels on individual buildings or covering parking areas

Potential Strategies: Independent Energy Sources

WIND

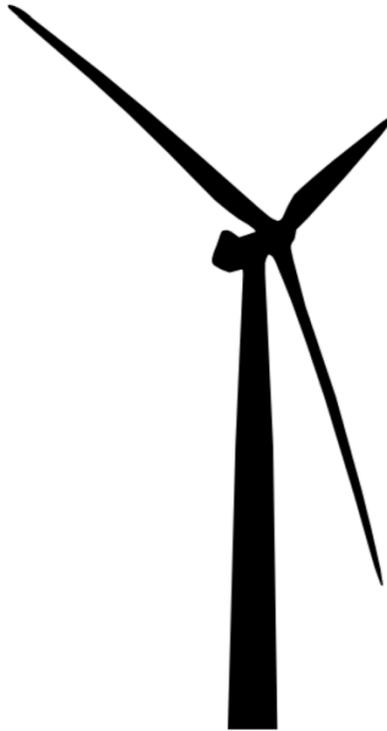


Illustration of concept for discussion purposes only

Three types of wind power

- *Small-wind*
- *On-shore*
- *Off-shore*

- Should be combined with energy storage system
- Functions when grid goes out
- Feeds into grid during normal operations

Potential Strategies: Independent Energy Sources

NATURAL GAS POWERED SMALL GENERATORS

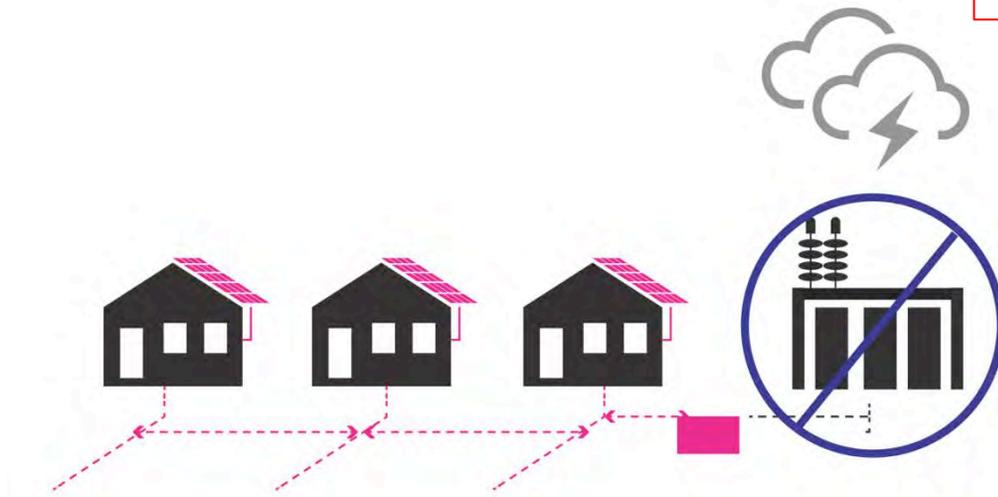
- Natural gas system more reliable than liquid fuels

**Illustration of concept for
discussion purposes only**

Potential Strategies: Independent Energy Sources

MICROGRID

Illustration of concept for discussion purposes only



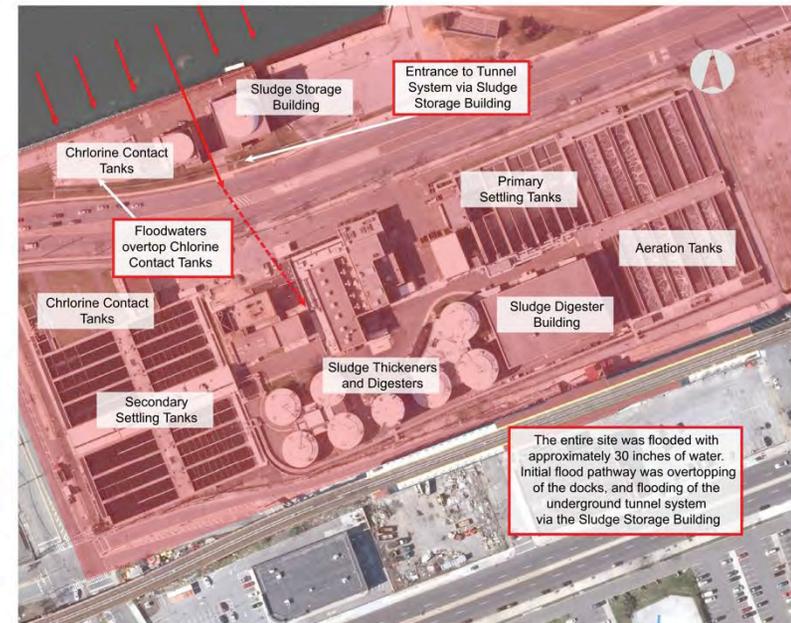
A micro-grid acts as a self-sufficient unit when the larger grid is compromised

- Smaller portion of the larger electrical grid
- Can be disconnected from the larger grid during emergency
- Contains independent power generation sources and load balancing within micro-grid

Rockaway Wastewater Treatment Plant Odor

NOTE: Without being able to speak to DEP, we can only make educated guesses about what's going on

- Entire site flooded with 30" of water
 - Likely still getting up to speed with equipment, digesting bacteria
- Ongoing odor
 - Related to specific function?
 - Sandy related?
 - Drought related?
- Questions
 - Constant or intermittent?
 - Since when?
 - Is any part of the plant down or not running, or is the plant running differently from before?
 - Copy of DEP presentation?



Types of Water Management System

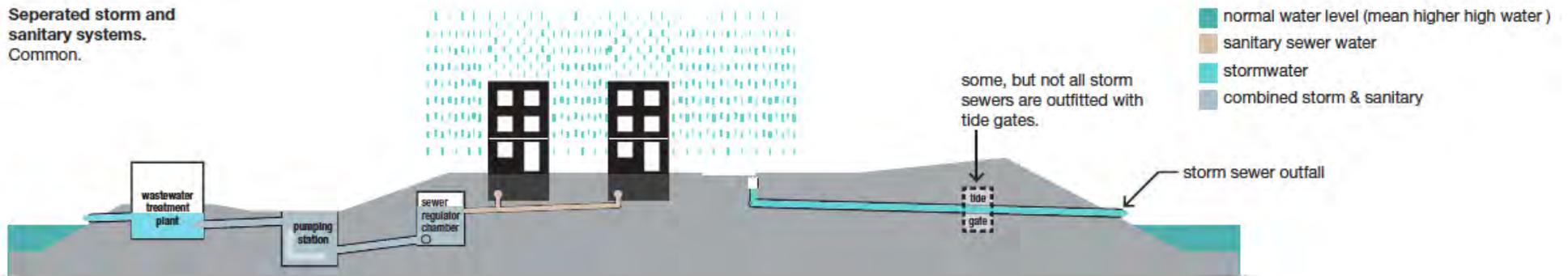
- Rockaway West is largely served by a **SEPARATED** sewer system.

NYC Sewer Systems



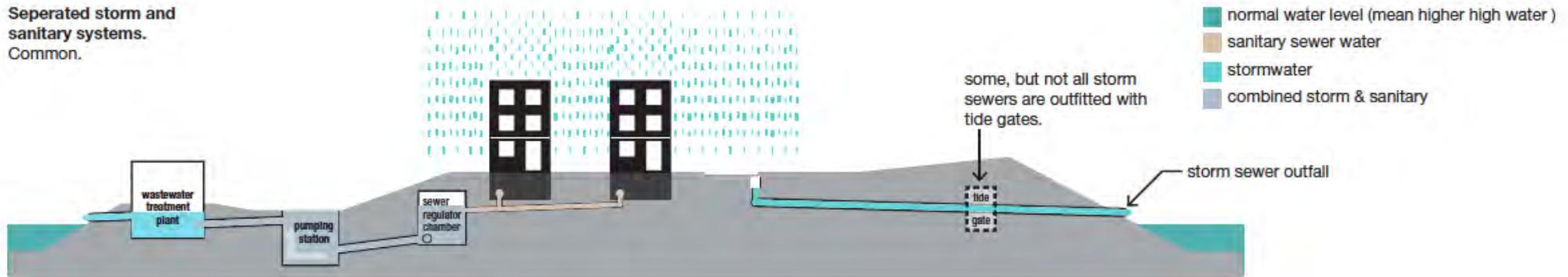
Separated Storm and Sanitary System:

Separated storm and sanitary systems. Common.



Separated Storm and Sanitary System: In a storm event

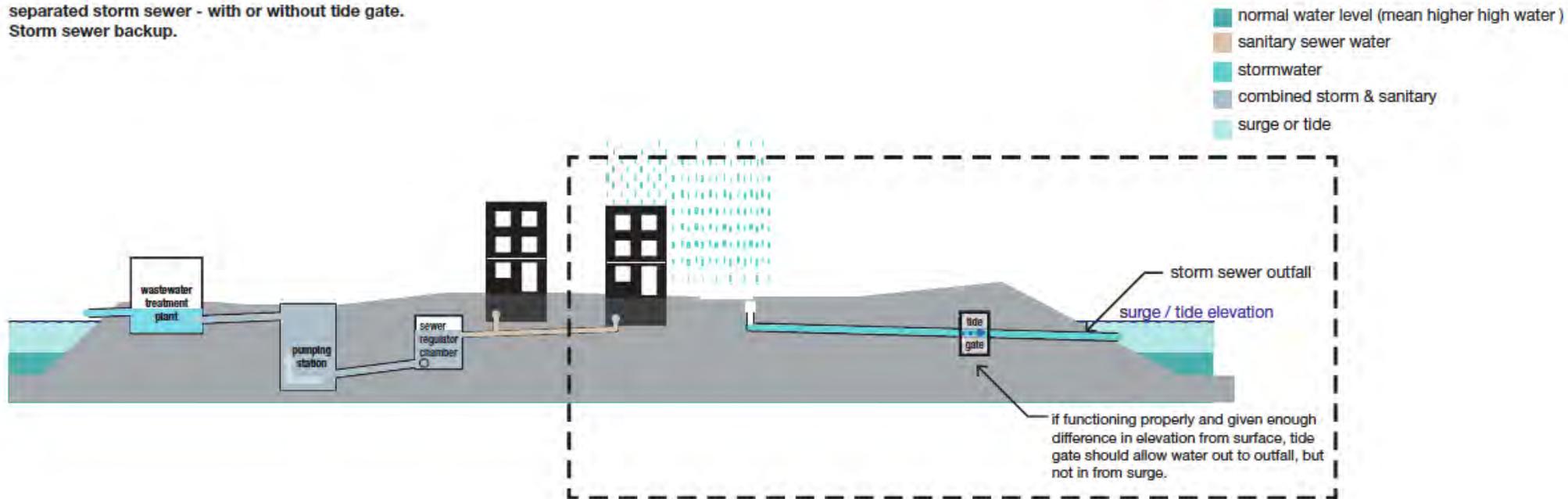
Separated storm and sanitary systems.
Common.



Separated Storm and Sanitary System: In a surge or tide event

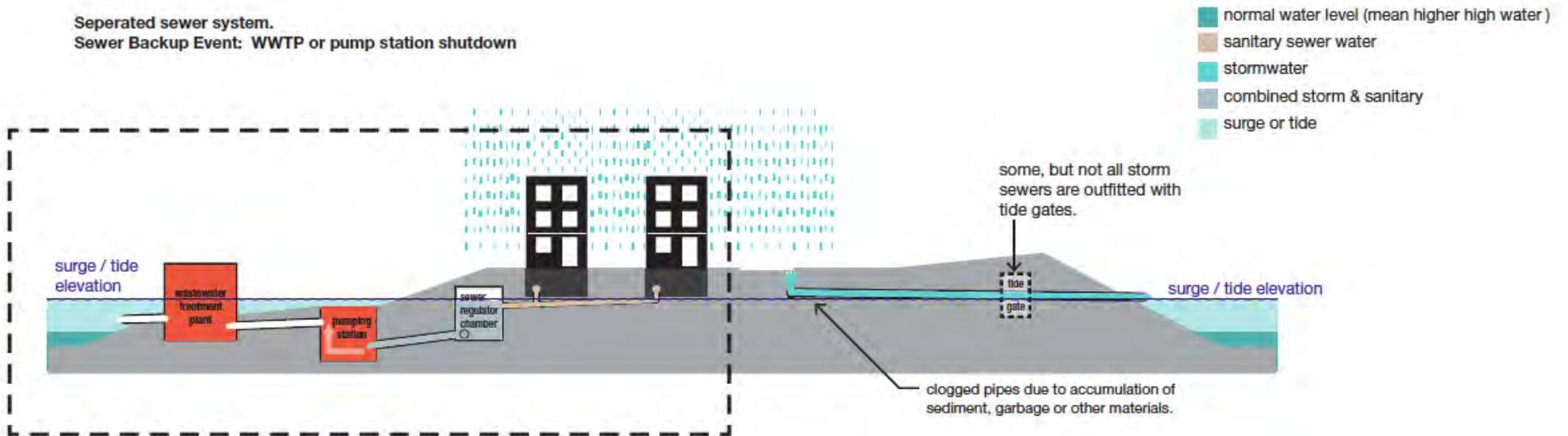
surge or tide event

separated storm sewer - with or without tide gate.
Storm sewer backup.



Separated Storm and Sanitary System: WWTP Failure

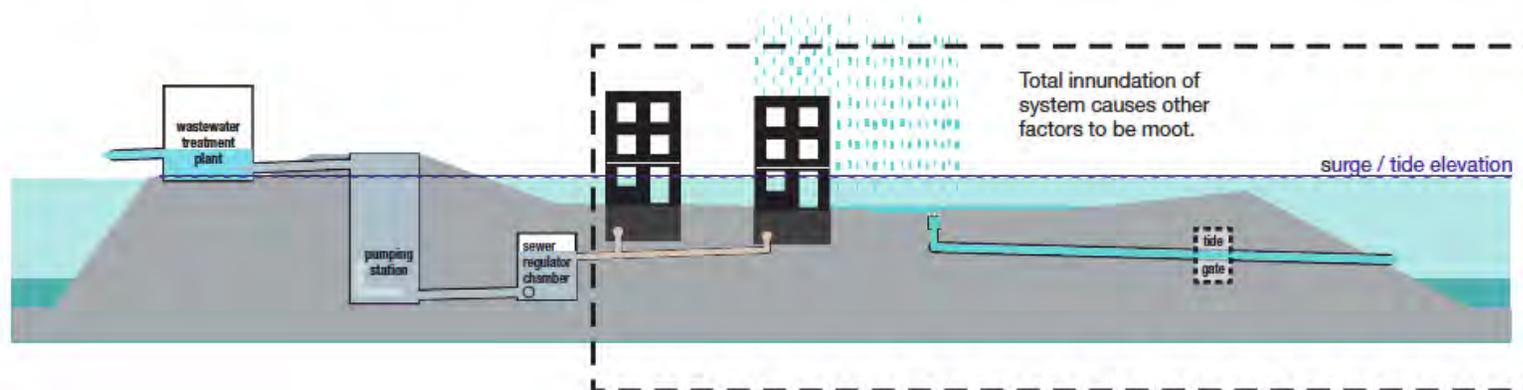
Separated sewer system.
Sewer Backup Event: WWTP or pump station shutdown



Separated Storm and Sanitary System: Total inundation

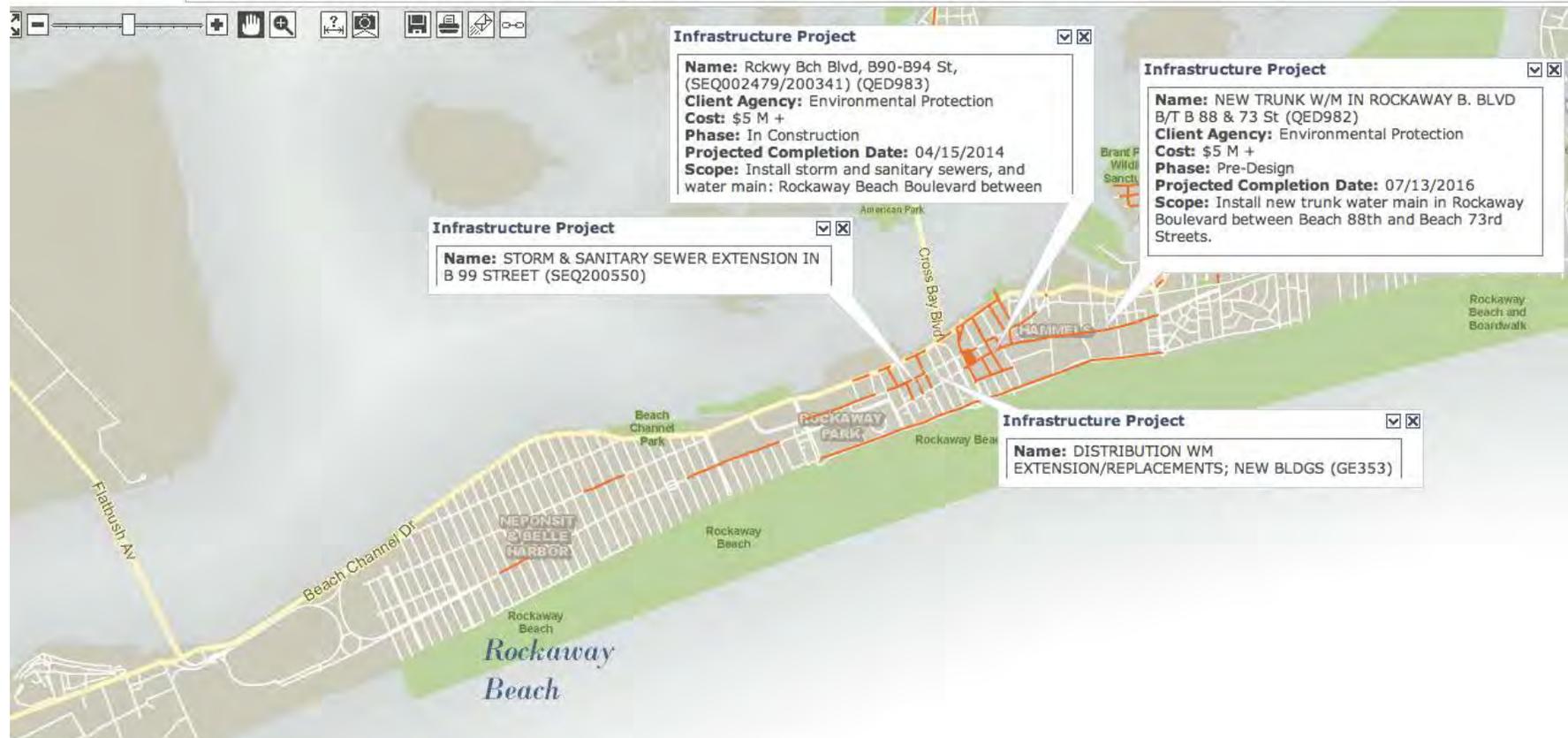
separated storm sewer

Total inundation of storm sewer system and area.



NYCDEP Projects in Progress

Search for a location: Enter an address, intersection, community district, ZIP code, etc...



Other Plans & Studies

■ NYC DEP Wastewater Resiliency Plan

– Wastewater Treatment Plants

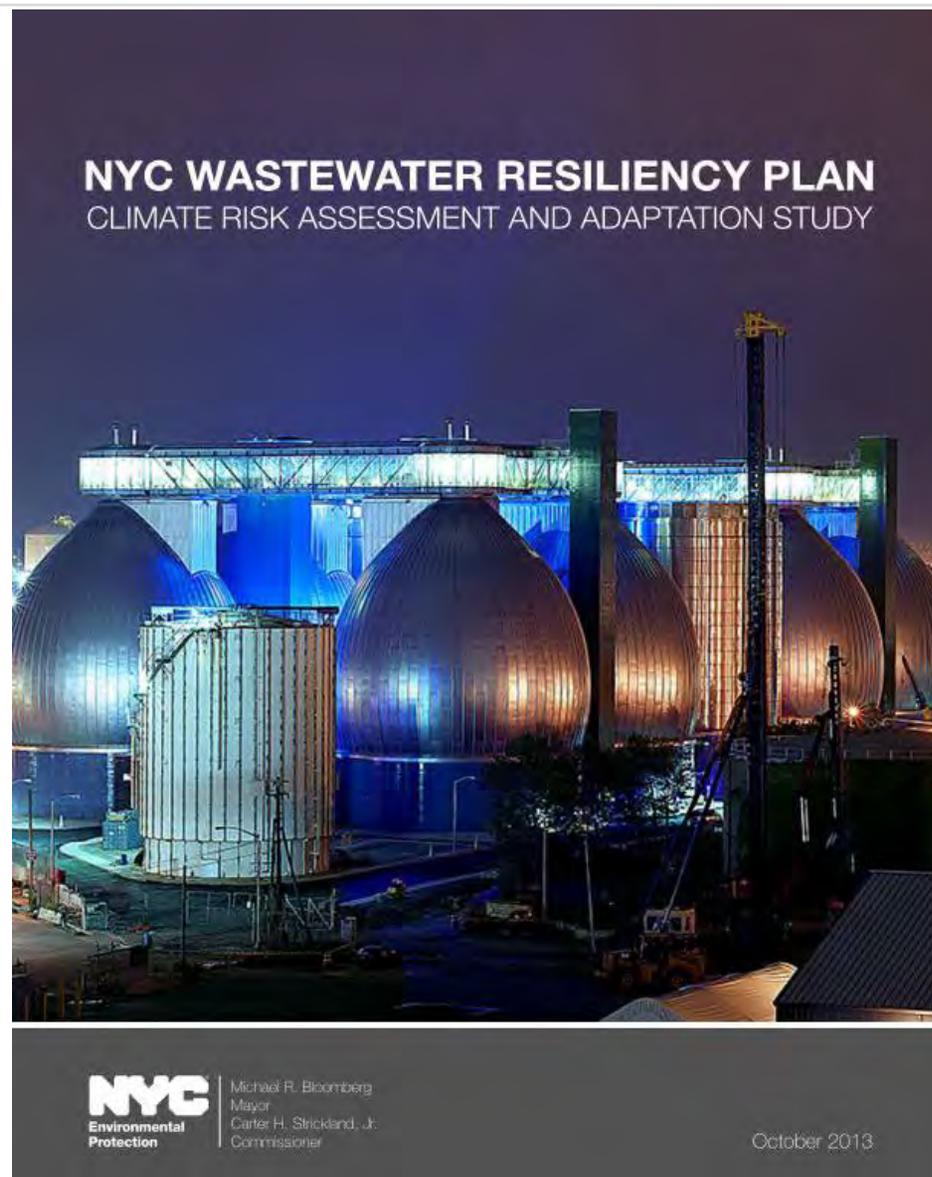
- Identified plant-specific resiliency upgrades for the 14 at-risk wastewater treatment plants.
- Prioritized upgrades at plants that can effect bathing beaches as a high priority for upgrades.

– Pumping Stations

- Identified station-specific resiliency upgrades for the 58 at-risk pumping stations.
- DEP will upgrade pumping stations based on level of risk at the facility. Level of service to the community, and whether the facility has other planned capital improvements.

– Analyzed need, feasibility, and benefit of tide gates on storm sewer outfalls

– Calculated the cost of repair needed to the system.



NYC Wastewater Resiliency Plan: Wastewater Treatment Plants and Pump Stations At Risk



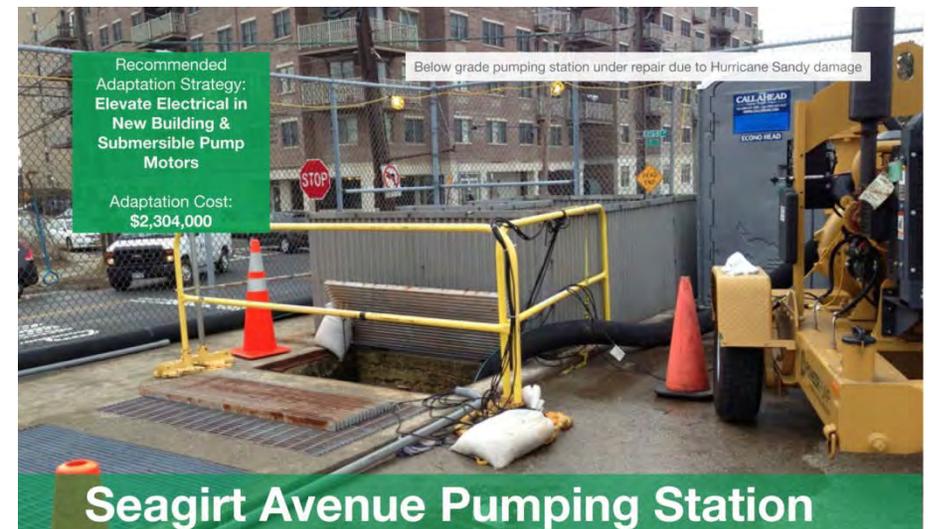
NYC Wastewater Resiliency Plan: Wastewater Treatment Plant

- Resiliency Measures
 - Construct barriers, seal buildings, elevate equipment, etc.
 - \$15.1 Million
- Feasibility study underway
 - Conversion to pumping station?
 - Other alternatives?

Location	Recommended Protective Measure	Cost of Protective Measures (\$M) ¹	Damage Cost for Critical Flood without Protection (\$M) ^{1,2}	Cumulative Risk Avoided Over 50 Years (\$M) ^{1,3}	Resiliency Level
Chlorination Building	Elevate Equipment	\$2,048,000	\$1,729,000	\$8,900,000	Very High
Chlorine Contact Tanks (N. of Beach Channel Dr.)	Elevate Equipment	\$58,000	\$127,000	\$660,000	Very High
Electrical Substation	Elevate Equipment and Construct Barrier	\$1,604,000	\$4,558,000	\$23,453,000	Very High
Final Settling Tanks	No Action Required	\$0	\$1,382,000	\$0	No Protection
Heating Plant	Elevate Equipment	\$37,000	\$1,169,000	\$815,000	Low
Main Sewage Pump Station	Seal Building	\$751,000	\$5,135,000	\$23,778,000	Moderate
New Digester Building	No Action Required	\$0	\$1,139,000	\$0	No Protection
New Sludge Storage Building	Seal Building	\$493,000	\$404,000	\$1,872,000	Moderate
Old Digester Building	Sandbag	\$158,000	\$1,569,000	\$662,000	Moderate-Low
Primary Scum Building	Flood-proof and Elevate	\$2,142,000	\$2,872,000	\$14,270,000	High
Pump and Compressor Building	Elevate Equipment and Seal Building	\$2,594,000	\$9,694,000	\$48,094,000	High
Return and Waste Sludge Pump Building	Elevate Equipment and Seal Building	\$3,147,000	\$8,248,000	\$40,822,000	High
Sludge Thickener Building	Seal Building	\$1,332,000	\$7,300,000	\$33,804,000	Moderate
Tunnels	Construct Barrier	\$752,000	\$3,957,000	\$967,000	High
Total for All 14 At-Risk Locations		\$ 15.1 M	\$ 49.3 M	\$ 198.1 M	

NYC Wastewater Resiliency Plan: Pumping Stations

- Bayswater Avenue
 - Flood-proofing controls
 - \$171K
- Seagirt Avenue
 - Elevate electrical equipment
 - Submersible pump motors
 - \$2.3M



NYC Wastewater Resiliency Plan: Tide Gates

- “No benefit” in Rockaways
- Tide levels too high relative to stormwater levels at gate
 - Not enough pressure to force them open



Strategy:

Improve drainage and reduce flooding from sewer backup

- Need Addressed: Improve drainage and reduce flooding from stormwater backup
- The problems:
 - While the entire area was inundated during sandy, flooding of low-lying land and buildings during more frequent storm events is a reoccurring problem

Potential Approaches

- Ongoing and regular maintenance to keep things flowing in heavy downpours or to clear flooding from surge
 - Catch basins
 - Network of pipe infrastructure
- Better management of system assets
 - Understanding condition, age, locations of compromise, etc., of the system
- Keep excess water out of system
 - “Green” infrastructure to capture and absorb stormwater
 - “Blue” infrastructure for temporary detention of stormwater
- Anticipate future events
 - Ensure future pipe installation considers high tailwater condition

Infrastructure: Other ideas and strategies

- Implement back-up ‘hard-wired’ communications networks to serve as redundant system from mobile services
- Implement emergency communication system
- Implement green infrastructure projects (to mitigate stormwater runoff and sewer overflows)

Strategy: Expand Transportation



Existing Plans and Projects: Transportation

- Street resurfacing projects
- Reconstruction of Shore Front Parkway
- Ferry service (funded through January 2014)



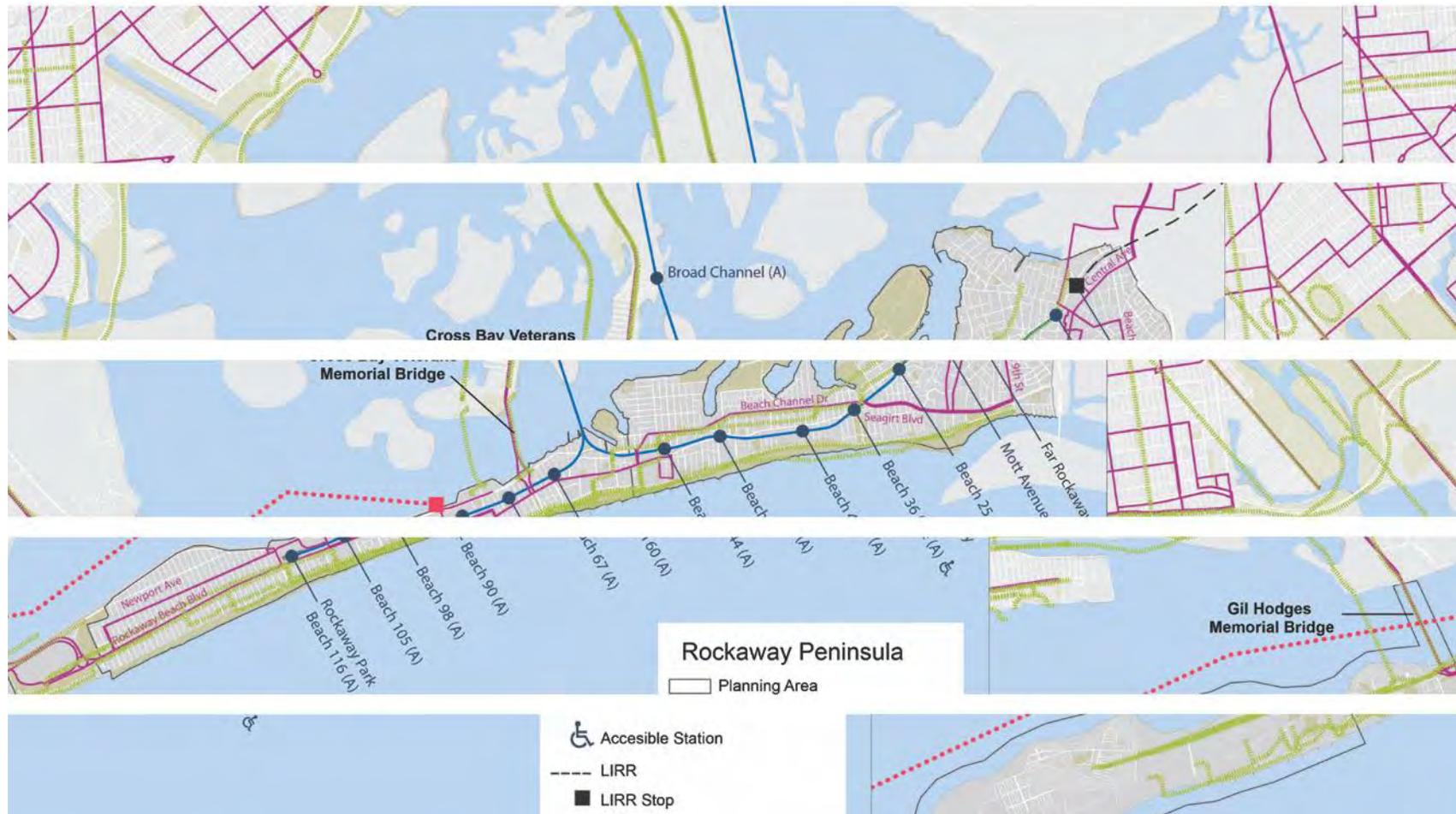
Infrastructure/Transportation: Initiatives

- Expansion of ferry service to a permanent transportation option
- Create emergency transportation plans to ensure safe and sufficient transport off/onto the peninsula before and after a major storm
- Evaluate opportunities to expand transportation network for the community (e.g. Bus Rapid Transit, other ferry opportunities, etc.)
- Consider project to raise roadways, especially along the perimeter of the peninsula
- Ensure bridges, roadways and trains are strengthened to withstand extreme weather events

Infrastructure/Transportation: Questions

- What are the greatest transportation issues or priorities in the community?
- If the ferry is made permanent, would you consider moving the ferry landing location?
- Is there anything else you would change about the ferry (other than making it permanent)?
- Do you have ideas concerning the subway?
- Are there opportunities to improve the roadway under the elevated train?
- Are there roads you think should be elevated? If so, what are the pros/cons of doing so?
- Would you benefit from expanded cross-peninsula bus service?
- What are the opportunities to use transition hubs to connect and build up the community?
- What else have you considered or would you like to suggest?

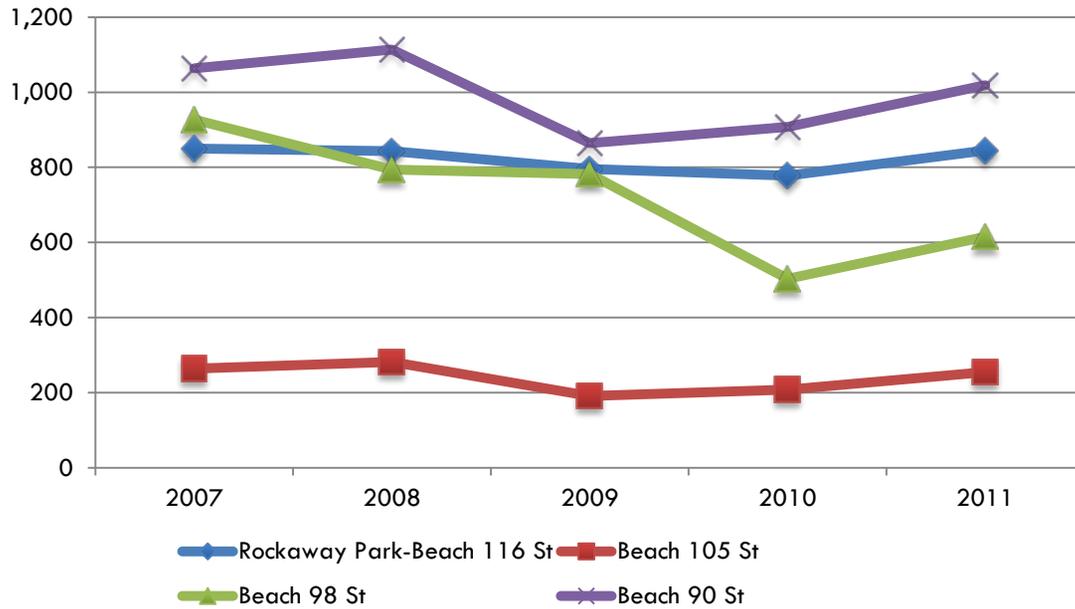
Existing Transportation Services and Infrastructure (Regional Overview)



Existing Transportation Services and Infrastructure (Community Overview)



A Train Daily Ridership



Station	2012 Ridership	2012 Rank (of 421)
Rockaway Park-Beach 116 St	741	413
Beach 105 St	253	418
Beach 98 St	572	415
Beach 90 St	877	412
Times Square	195,464	1

Source: MTA

- Flat ridership numbers
- Low ridership relative to MTA system

Existing AM Inbound Service & Travel Times

Mode	AM Service	Travel Time to Midtown	Travel Time to Lower Manhattan
A Line Mott Ave Branch	13 inbound trains (7-9am)	1 hr 15 mins	1 hr
A line B 116 th Branch	5 inbound trains (6:30-8am) One-way rush hour service	1 hr 8 mins	55 mins
LIRR (Far Rockaway)	10 inbound trains (5am – 9am)	57 min (some with transfer at Jamaica)	NA
Ferry	5 ferry departures (5:30-9:30am)	1 hr 15 mins (no transfer) 1 hr 30 mins (transfer at Pier 11)	55 mins
QM16 Express Bus (Neponsit-Midtown)	8 buses (6-8am)	1 hr	NA
QM17 Express Bus (Far Rockaway- Midtown)	7 buses (6-8am)	65 mins	NA

Journey to Work: Destination and Mode

TO	Car	Public Transit	Other	Total	Percent
Queens	3,800	1,060	1,530	6,390	47%
Other Boroughs	4,100	3,030	10	7,140	52%
Out of State	120	0	10	130	1%
Total	8,020	4,090	1,550	13,660	
Percent	59%	30%	11%		100%

Source: American Community Survey (2011), Means of Transportation To Work by Place of Work—State & County Level (B08130)

- Over half drive to work, and 30% take transit
 - Roughly equal number of people work in Queens and the rest of New York City
-

Existing Plans & Projects



Other Plans

- Woodhaven Boulevard Select Bus Service (2014)
- Jamaica Bay Greenway Implementation Plan (2015)
- Rockaway Crossings Master Plan (2018)
- Shore Front Parkway (2023)

Issues

- A train stations are mostly not ADA accessible
 - A train did not reopen until May 2013
 - A train service is limited
 - Emergency access dependent on Cross Bay and Marine Pkwy Bridges
 - Temporary ferry service ends January 2014
 - Lack of intra-Peninsula connections to commercial corridors and key transportation nodes
-

Potential Strategies

“Improve and expand transportation networks for the communities across Rockaway West to ensure ongoing connectivity and multiple access redundancy” (overarching strategy from Concept Plan)

Issue	Potential Strategy	Pros	Cons
A train outage after storm	Emergency transfer policy to LIRR if A train is shut down	Redundancy	Agency reluctance
Limited A train service	Reactivation of LIRR Rockaway Beach Line	Redundancy New destinations	High cost Agency reluctance
	More frequent A train service	Increased options	Capacity constraints
	SBS/BRT service to major destinations (Build on upcoming planned Woodhaven Blvd. SBS)	Redundancy New destinations Improved travel time	
Temporary ferry service ends January 2014	Continued/expanded ferry service	Reliable, popular form of transportation	Large per-trip subsidy
Emergency access dependent on bridges		Redundancy	
A train stations are mostly not ADA accessible	A train ADA station accessibility	Support for vulnerable populations	Expense relative to ridership

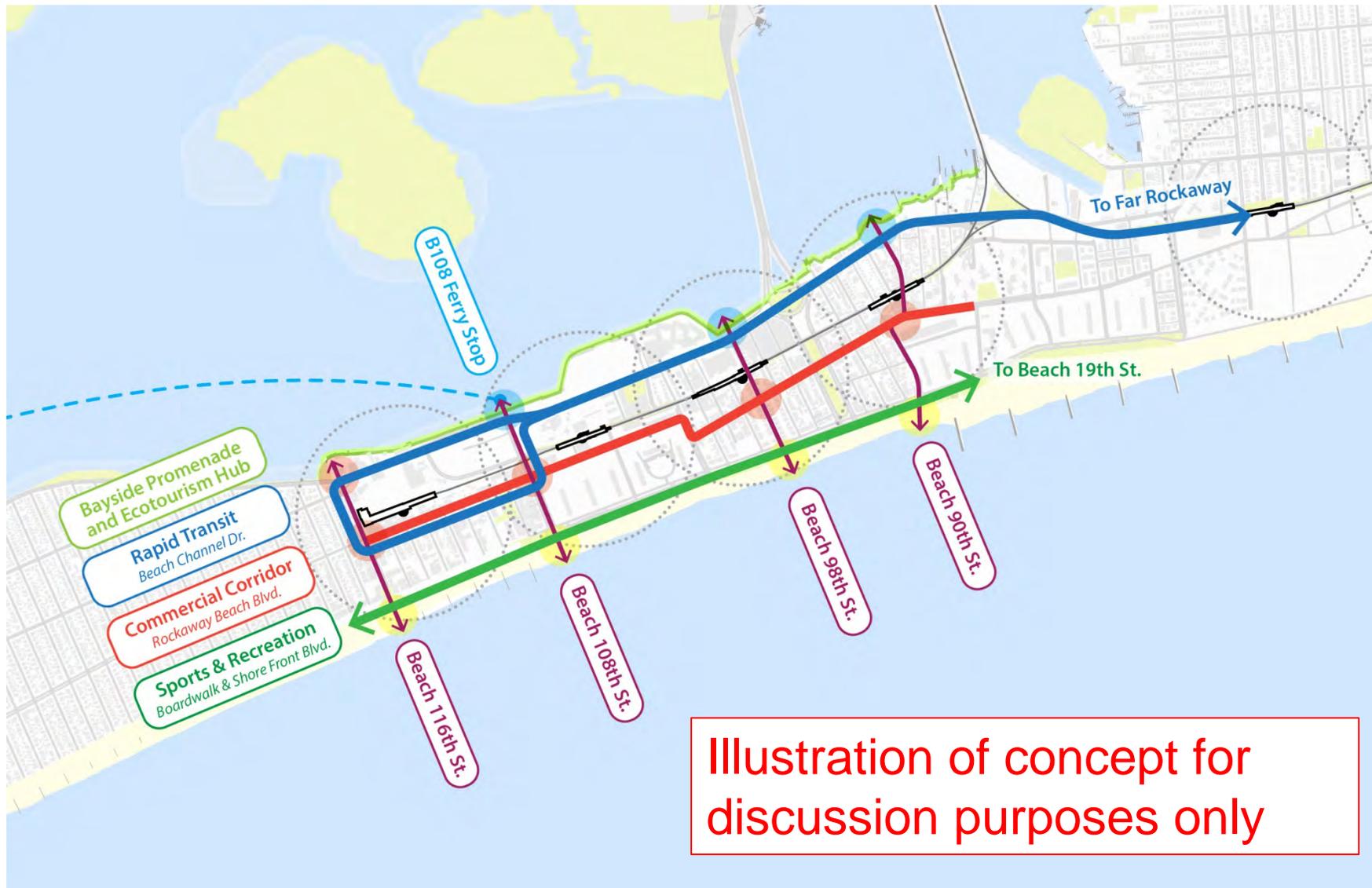
Potential Strategies (con't)

Issue	Potential Strategy	Pros	Cons
Lack of intra-Peninsula connections to commercial corridors and key transportation nodes	North-south bicycle and pedestrian linkages	Low cost	Safety
	Enhance existing bus (Q22) or design intra-peninsula circulator	Relatively low cost Builds on existing	Operating subsidy
	Enhance/clarify east-west roadway alignments	Enhance experience	High cost
	Reactivate road under viaduct	Make use of existing space	Complex ownership
	Input on Shore Front Parkway Redesign	Stormwater improvements	2023

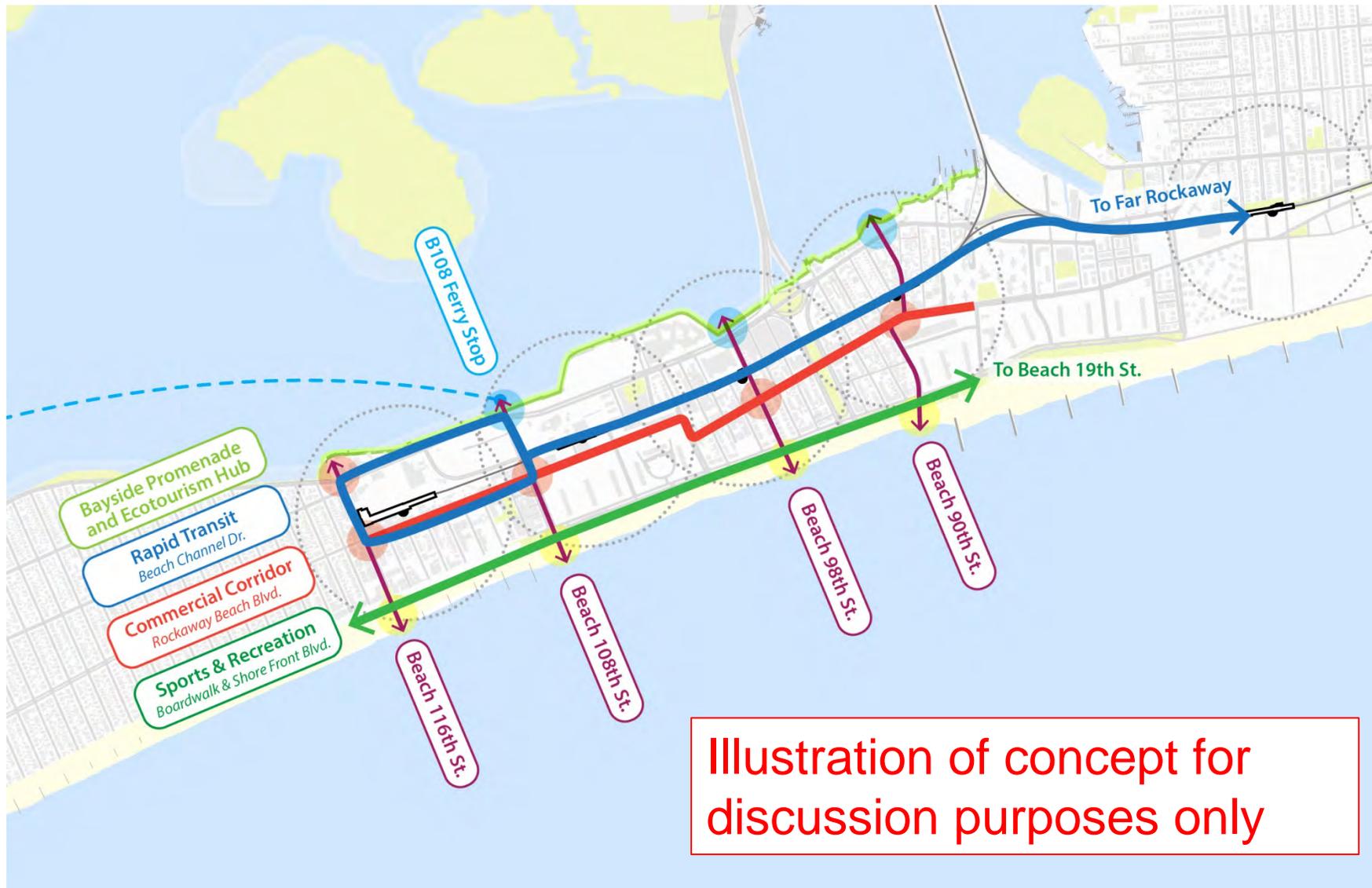
Discussion

- What are key transportation priorities?
 - Are there more specific transportation strategies to consider?
 - What are the regional transportation approaches we can consider?
 - Are there additional co-benefits we can consider?
-

Three Spines – Option 1 – Beach Channel Drive

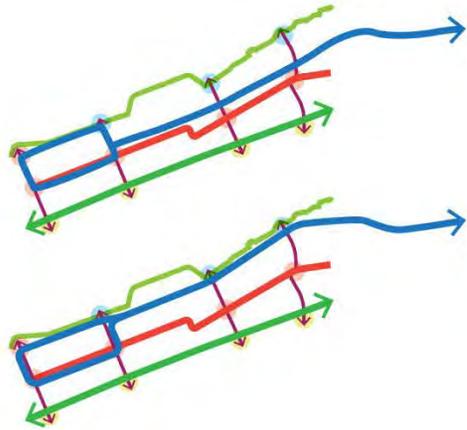


Three Spines – Option 2 – MTA R.O.W.



Three Spines

Illustration of concept for discussion purposes only



Ecotourism Hub
Bayside Food Market



Cogoletto, Italy



Victoria and Alfred Water Front, Cape Town



Commercial Hub
Transportation Hub



Key West, Florida



Pier 39, San Francisco



Sports & Recreation
Oceanside Park
Seasonal Festivals



Hossegor, France



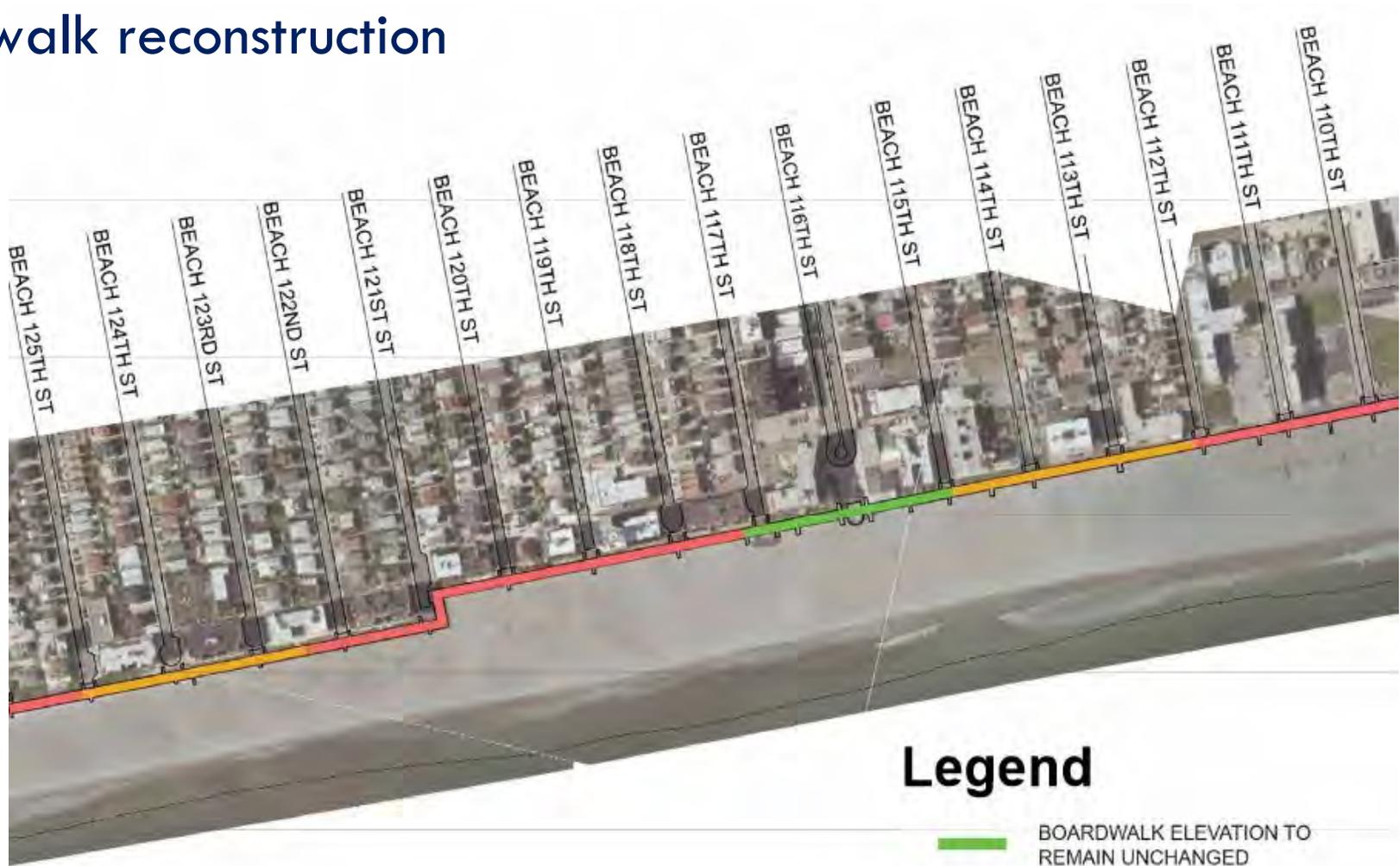
Hilton Head Island, South Carolina

Strategy: Promote Economic Viability and Sustainability



Existing Plans and Projects: Economic Vitality

■ Boardwalk reconstruction



Legend

-  BOARDWALK ELEVATION TO REMAIN UNCHANGED
-  BOARDWALK ELEVATION TO INCREASE 0FT - 2FT
-  BOARDWALK ELEVATION TO INCREASE 2FT - 4FT
-  BOARDWALK ELEVATION TO INCREASE 4FT - 7FT



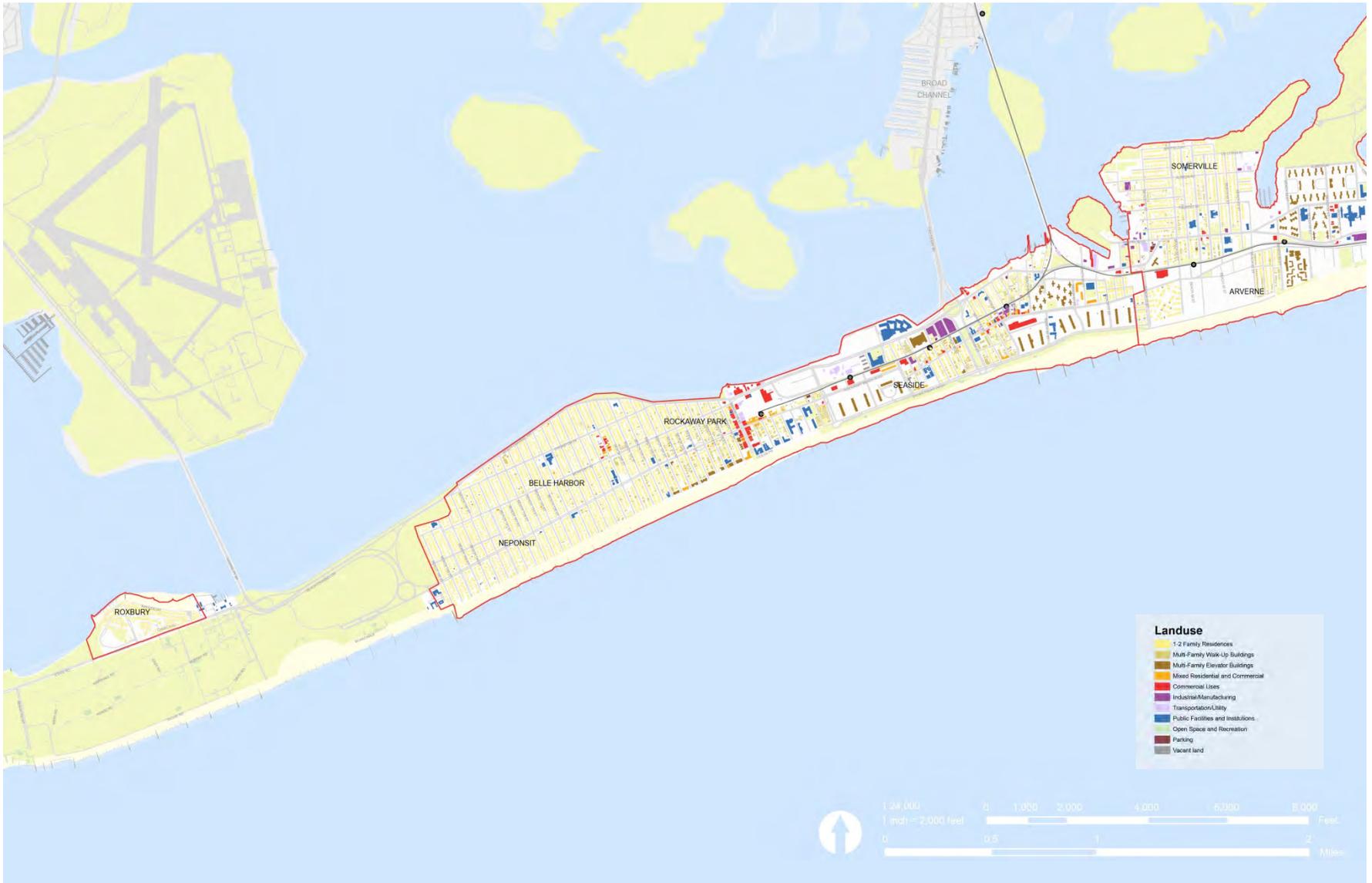
Economic Sustainability: Initiatives

- Consider regulations to require basic emergency preparedness and recovery standards for businesses, especially critical services like food, water, banks, and gas (e.g. require back-up generators, emergency supplies, etc.)
- Pursue strategy to expand and retain commercial vibrancy of all commercial corridors
- Evaluate scope of City's business recovery plans, determine gaps, and create a proposal to address other needs to rebuild or protect retail corridors
- Finalize and pursue strategy to redevelop National Grid Site
- Expand low-cost loan programs to help make businesses more resilient
- Pursue business incentive programs to draw more businesses to Rockaway West
- Identify and pursue warehouse type locations for use as small business incubators

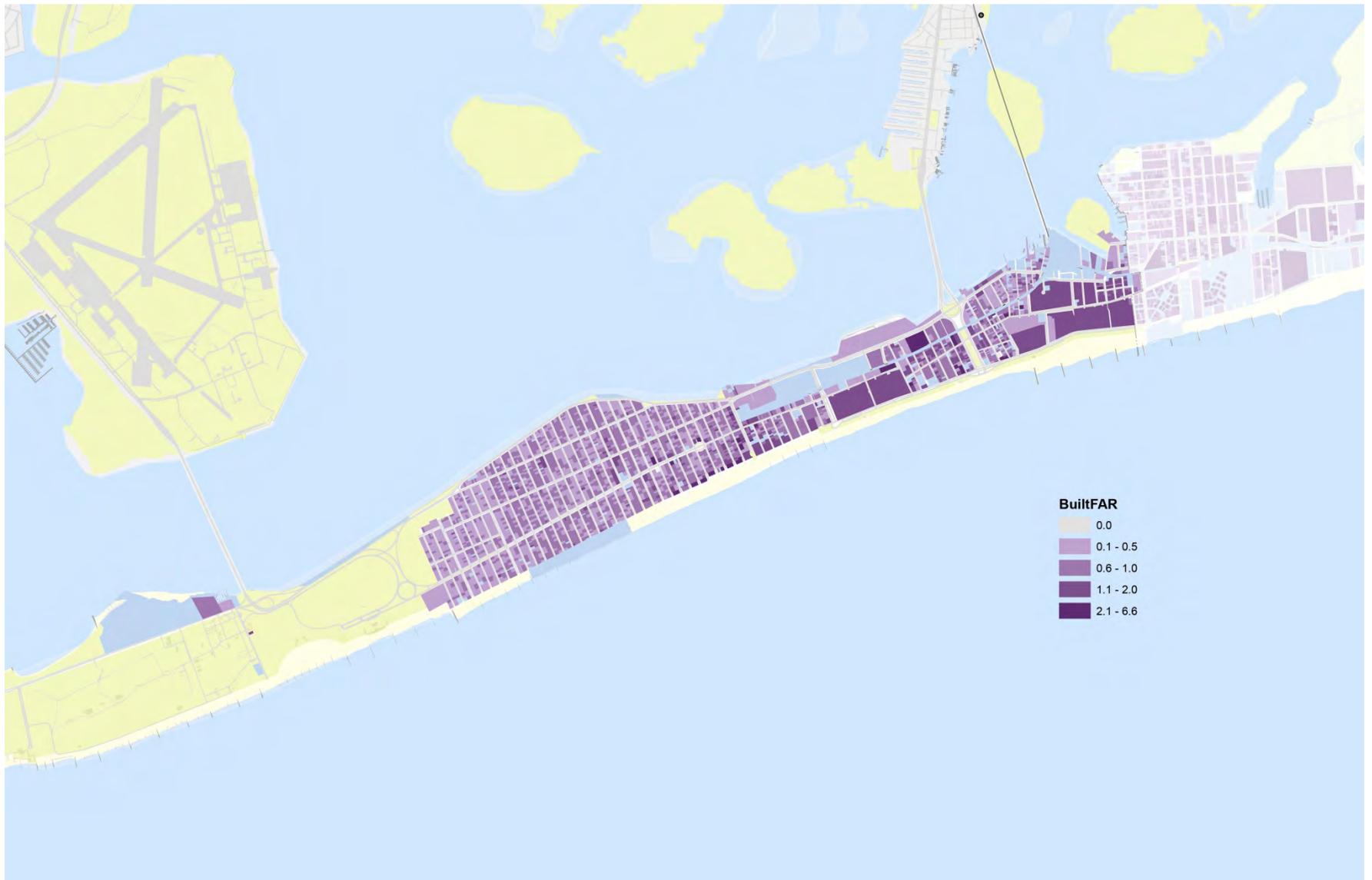
Economic Sustainability: Questions

- What is the best way to organize local businesses around planning and resiliency efforts?
- Are there gaps in types or quality of services in the current commercial corridors?
- Is it important for local businesses to serve the community or draw visitors? Or both? Or something else?
- How well does the community currently support local business?
- Do you think there's an opportunity to grow business or should the focus be on strengthening what exists?
- Are there opportunities to coordinate across the peninsula?
- Are there opportunities to generate income for the community from the beach? From the bay?
- What else have you considered or would you like to suggest?

Land Use



Built FAR



Soft Sites

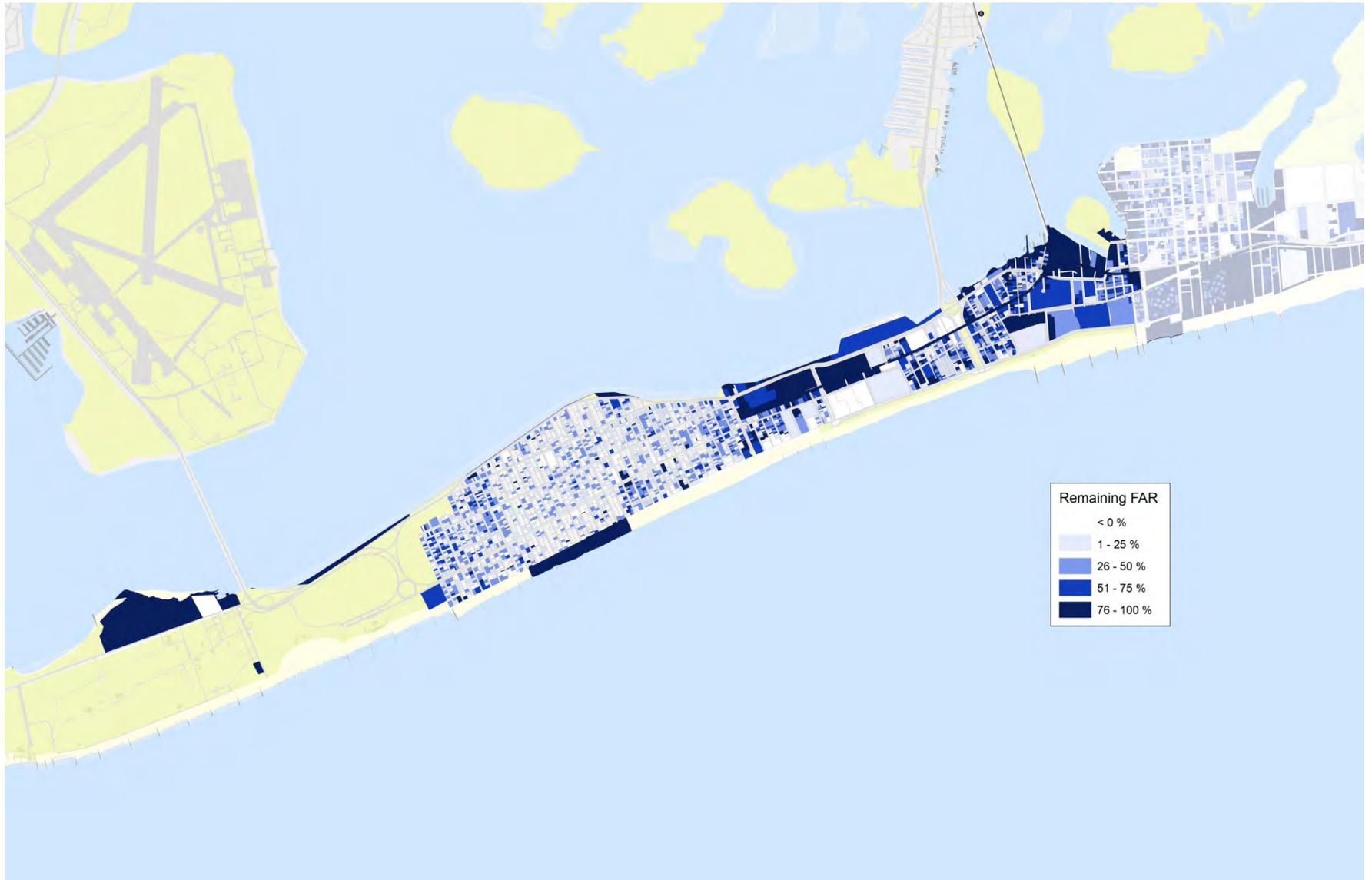
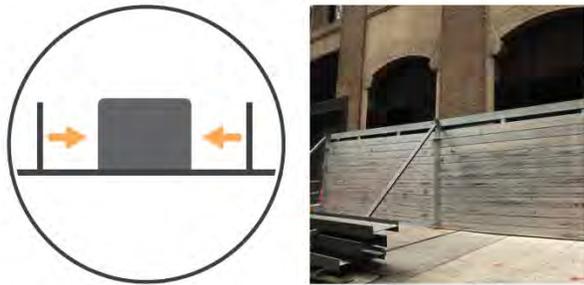


Illustration of concept for discussion purposes only

Design Approaches

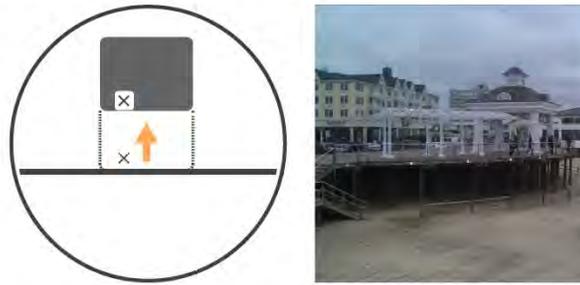
PROTECT



Verizon Building Deployable Flood-wall – New York City

Businesses can layer in additional protection for the building envelope and interior. This can take the form of a deployable flood wall around buildings, or other measures that work with the facade, interior, or structure of the building. Verizon has installed such a system at its headquarters in Lower Manhattan.

ELEVATE



Pier Village – Long Branch, NJ

Pier Village, a recently developed mixed-use on the Jersey Shore, fared very well in Sandy - a mix of building at elevations above the 100 year floodplain and building densely so that most of the rentable space is even higher.

Elevating strategies can also include the elevation of building mechanical elements which are commonly found in basements and first-floors.

CONNECT



Harbor Point - Stamford, CT

Infill development helps to “fill in the gaps,” making it easier to offer continuous protection for businesses. By creating density of retail, you increase the amount of services available to residents after storms and increase land values that can make protection strategies more feasible. Harbor Point in Stamford, CT redeveloped waterfront industrial into mixed-use residential, transforming a largely vacant area into a high-value transit oriented development.

Illustration of concept for discussion purposes only

Implementation Approaches



MANAGE

Manage

Coordination among business owners allows for the implementation of flood protection and recovery after the storm.



INCENTIVIZE

Incentivize

Grants can be made to the businesses for improvements directly, allowing for the fast adoption of strategies where they are most needed.



FINANCE

Finance

When grants aren't an option, the availability of low-cost loans can help spread the cost of improvements over the course of many years, making the investment feasible to the businessowner.



REGULATE

Regulate

Regulations can help decide what can be built and how it can be built. In certain conditions, regulations can mitigate what is at risk, or help to make sure that recovery is made easier by removing obstacles.

Economic Viability and Sustainability: Initiatives

- Consider regulations to require basic emergency preparedness and recovery standards for businesses, especially critical services like food, water, banks, and gas (e.g. require back-up generators, emergency supplies, etc.)
- Pursue strategy to expand and retain commercial vibrancy of all commercial corridors
- Evaluate scope of City's business recovery plans, determine gaps, and create a proposal to address other needs to rebuild or protect retail corridors
- Finalize and pursue strategy to redevelop National Grid Site

Economic Viability and Sustainability: Initiatives

- Expand low-cost loan programs to help make businesses more resilient
- Pursue business incentive programs to draw more businesses to Rockaway West
- Identify and pursue warehouse type locations for use as small business incubators

Economic Viability and Sustainability: Questions

- What is the best way to organize local businesses around planning and resiliency efforts?
- Are there opportunities to coordinate across the peninsula?
- Are there opportunities to generate income for the community from the beach?
- What else have you considered or would you like to suggest?

Strategy: Maintain Connection to Water



Existing Plans and Projects: Maintain Connection to Water

A New Vision for a Great Urban National Park

Gateway National Recreation Area

**Draft General Management Plan
Environmental Impact Statement
July 2013**



Maintain Connection to Water: Initiatives

- Create plan to expand recreation and other opportunities that complement the new plans for the boardwalk
- Pursue strategies to utilize the bay for recreation
 - e.g. private boating or commercial outfits (kayaking, windsurfing, sailing, etc.)
- Seek a few key opportunities to make Rockaway West more of a destination
 - e.g. outdoor performing theater, etc.
- Create and implement a comprehensive plan to maximize community engagement with both the ocean and the bay
 - i.e. resiliency protection plus full access, recreation, and commerce

Maintain Connection to Water: Questions

- What are the current challenges to accessing the water? What challenges do you anticipate in the future?
- Are there opportunities to expand on existing beach re-development plans?
 - If so, what else would you like to see at the beach - recreational, passive public space, natural preservation, cultural, commercial
- Are there other considerations for building up functions and uses of the bay?

Current State

- Department of Parks and Recreation
 - draft schematic design November 18
 - seeking CB 14 approval in December
- Draft Rockaway Conceptual Plan in December Final Conceptual Plan in March



Strategy: Rebuild and Protect Housing



Existing Plans and Projects: Housing

- Build it Back

**WAS YOUR HOME
DAMAGED OR
DESTROYED BY
HURRICANE SANDY?**

NYC BUILD IT BACK is a City program that provides assistance to homeowners, renters and landlords in the five boroughs impacted by Hurricane Sandy.

**CALL
311
or visit**
nyc.gov/builditback



NYC Housing
Recovery



WE ARE PLEDGED TO THE LETTER AND SPIRIT OF U.S. POLICY FOR THE ACHIEVEMENT OF EQUAL HOUSING OPPORTUNITY THROUGHOUT THE NATION. WE ENCOURAGE AND SUPPORT AN AFFIRMATIVE ADVERTISING AND MARKETING PROGRAM IN WHICH THERE ARE NO BARRIERS TO OBTAINING HOUSING BECAUSE OF RACE, COLOR, RELIGION, SEX, HANDICAP, FAMILIAL STATUS, OR NATIONAL ORIGIN.

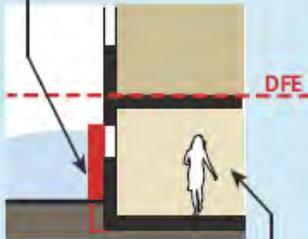
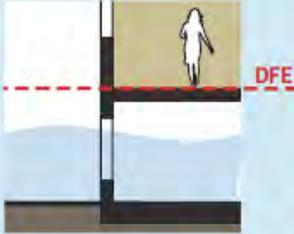
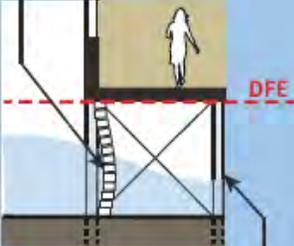
Rebuild and Protect Housing: Initiatives

- Evaluate scope of the City's Build it Back program, determine gaps, and create a proposal to address other needs to rebuild or protect housing
- Create program to help homeowners assess technical housing needs, provide counseling on insurance issues, rebuilding, etc.
- Create a grant or low-cost loan program to help people make homes more resilient, ensuring this includes co-ops as well as single-family homes
- Create resiliency standards for 6+ floor multi-family buildings, for both private and regulated housing

Rebuild and Protect Housing: Questions

- If there is not enough funding to cover protection of all housing, how would you prioritize the funding? On housing? If so, how would you prioritize that?
- Are there opportunities for new housing development – such as new senior housing or mixed use housing (e.g. housing with ground floor retail)?
- Would you benefit from homeowner assistance and training (e.g. certified assistance in assessing your home elevation needs, learning more about flood insurance, or finding other flood insurance options)?
- Are there local community organizations that provide housing and community development support? If so, how do people use them and have they served a role after Sandy?
- What else have you considered or would you like to suggest?

Flood zone regulations for new construction

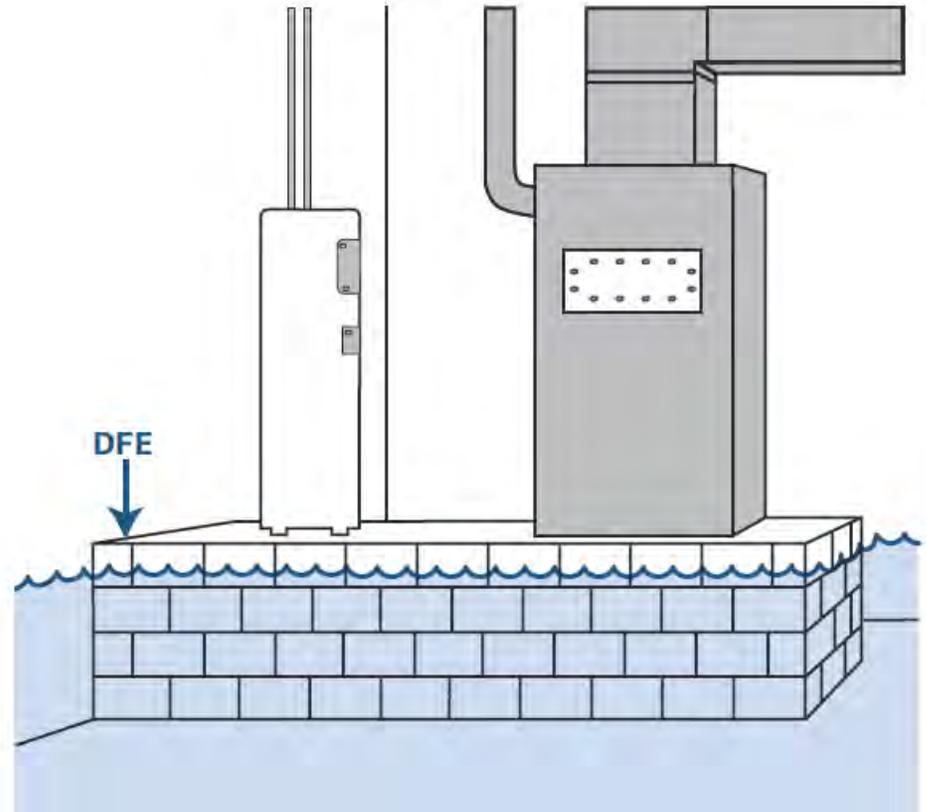
	A ZONE		V ZONE
FLOOD PROTECTION STRATEGY	DRY FLOOD-PROOFING WATERTIGHT STRUCTURE e.g., FLOOD SHIELDS	WET FLOOD-PROOFING WATER TO RUN-IN / RUN-OUT e.g., FLOOD VENTS	ELEVATED STRUCTURE VIRTUALLY OPEN STRUCTURE e.g., OPEN LATTICE BREAKAWAY WALLS
GROUND FLOOR CONFIGURATION	FLOOD SHIELDS PREVENT WATER FROM ENTERING  NON-RESIDENTIAL SPACE ONLY	 DFE	OPEN LATTICE BREAKAWAY WALL  VERTICAL FOUNDATION MEMBER
	LOWEST OCCUPIED FLOOR ALLOWED TO BE EXCAVATED BELOW GRADE NOT PERMITTED FOR ENTIRELY RESIDENTIAL BUILDINGS	LOWEST OCCUPIED FLOOR TO BE AT OR ABOVE DESIGN FLOOD ELEVATION	BOTTOM OF LOWEST STRUCTURAL MEMBER TO BE AT OR ABOVE DESIGN FLOOD ELEVATION
PERMITTED USE BELOW DFE	<ul style="list-style-type: none"> ✓ PARKING ✓ ACCESS ✓ STORAGE ✓ NON-RESIDENTIAL ✗ RESIDENTIAL 	<ul style="list-style-type: none"> ✓ PARKING ✓ ACCESS ✓ STORAGE ✗ NON-RESIDENTIAL ✗ RESIDENTIAL 	<ul style="list-style-type: none"> ✓ PARKING ✓ ACCESS ✓ STORAGE ✗ NON-RESIDENTIAL ✗ RESIDENTIAL

Options for existing single-family homeowners

Elevation of Building



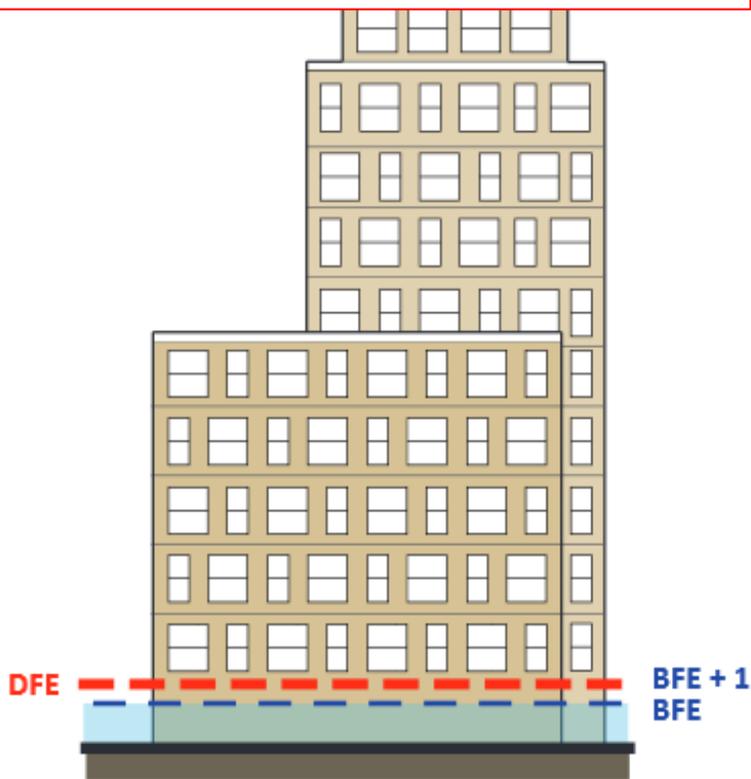
Elevation of Mechanicals



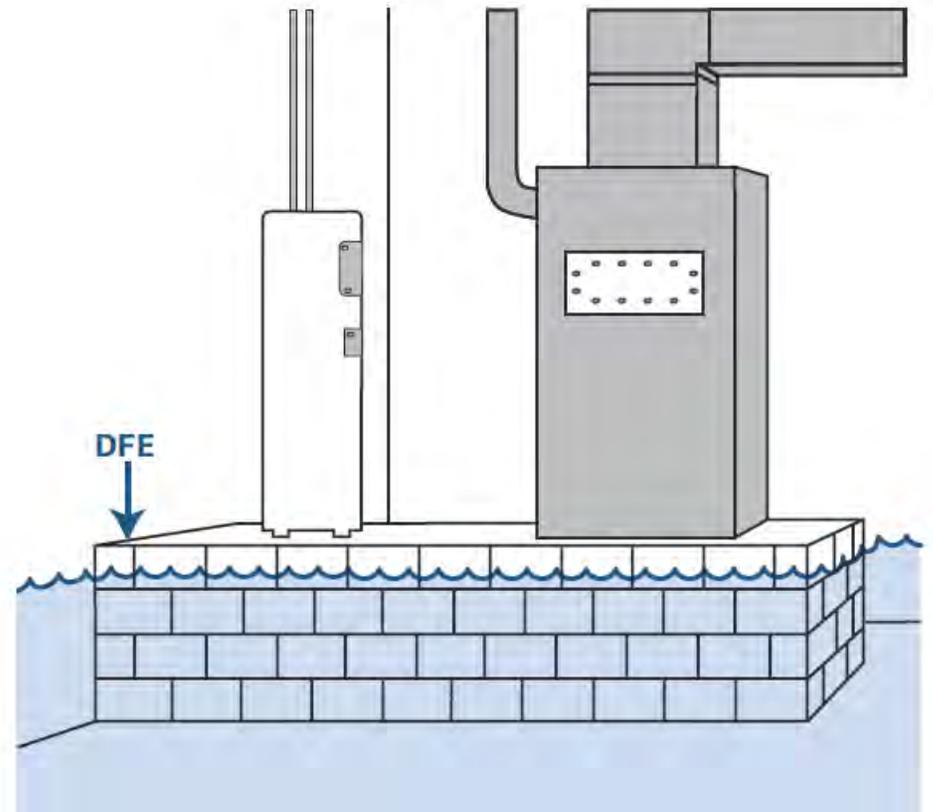
Options for existing multi-family homeowners

Floodable ground floor

Illustration of concept for discussion purposes only



Elevation of mechanicals



Strategy: Emergency Preparedness



Emergency Preparedness: Initiatives

- Identify and bolster key locations
 - Serve as safe, emergency/evacuation centers and potential temporary sites for pop-up centers, e.g. private school, open spaces
 - Determine needs, locations and sources and create emergency management plans, e.g. food, medical, sleeping supplies, etc.

- Pursue requirements for multi-family building owners, e.g.
 - Create, communicate, and ensure evacuation and emergency planning and recovery
 - Identify and assist seniors

- Pursue a strategy to create similar emergency plans for single-family homes neighborhoods, especially for vulnerable community residents

Emergency Preparedness: Questions

- Where would you locate an emergency center in the community? Could it serve as a multi-use facility?
- What supplies do you think the community needs to be safe through the next big storm?
- What, if any, emergency preparedness plans are in place? How well are the known and enacted? What would you add or change?
- Are there local community organizations that help coordinate and communicate emergency preparedness issues?
- What, if any, plans exist for vulnerable populations? What would you add or change?
- How would you compel multi-family building owners to create and enact emergency preparedness?
- What are the emergency preparedness needs of an individual homeowner?
- Are there emergency services you would like to see offered or built up in the community (eg. evacuation transportation)?

Emergency Preparedness, Response, and Recovery

Critical Emergency Functions

Capacity, Coordination,
Communication



First Response and Safety



Emergency Mobility



Shelter and Supplies



Preparedness, response, and recovery process

Preparedness

Plan and secure resources

Ongoing before emergency

Emergency

Response

Activate and coordinate

~Days 1-5

Recovery

Return to 'normal'

~Day 6 and beyond

Strategy: Health and Social Services



Existing Plans and Projects: Health and Social Services

■ Rockaway Courthouse Medical Center



Health and Social Services: Initiatives

- Create resiliency plans for schools to create safe emergency centers during and after a storm and to ensure a quick recovery
- Bolster all emergency service providers (e.g. police, fire, hospital) to ensure readiness in a large weather-related event
- Evaluate and pursue opportunities to create and expand health services in Rockaway West, especially emergency walk-in centers
- Evaluate risks to vulnerable populations in the V-zone and determine new guidelines on new construction in high-risk areas
- Create a ‘Coastal Commissioner’ who governs waterfront issues and projects and helps bridge issues across government entities

Health and Social Services: Questions

- What is the local capacity of nfp, social, cultural, or religious organizations and how did they serve you during/after Sandy? Is it important to bolster some of these organizations for the future?
- What specific health services do you think are needed in the community, particularly related to resiliency?
- How did lack of health services impact you and the community after Sandy?
- Are there opportunities to expand the scope and services of existing health care providers in the community?
- How do you want to protect schools?
- After an emergency, is it more important to use a school as a safe shelter or to return to running classes?
- Are there vulnerabilities in the current community emergency service providers?

Types of Healthcare Facilities & Services

Lower level of service

Any size population, Less funding

Higher level of service

Larger population, More funding

MOBILE MEDICAL VAN



- Basic primary care
- Prescriptions
- Can serve areas that lack larger medical facilities

WALK-IN URGENT CARE



- Treatment of variety of non-life-threatening injuries
- Minor medical procedures
- Limited on-site diagnostic equipment

AMBULATORY CENTER



- Mix of medical and surgical specialties
- Outpatient procedures and surgeries
- Comprehensive diagnostic equipment

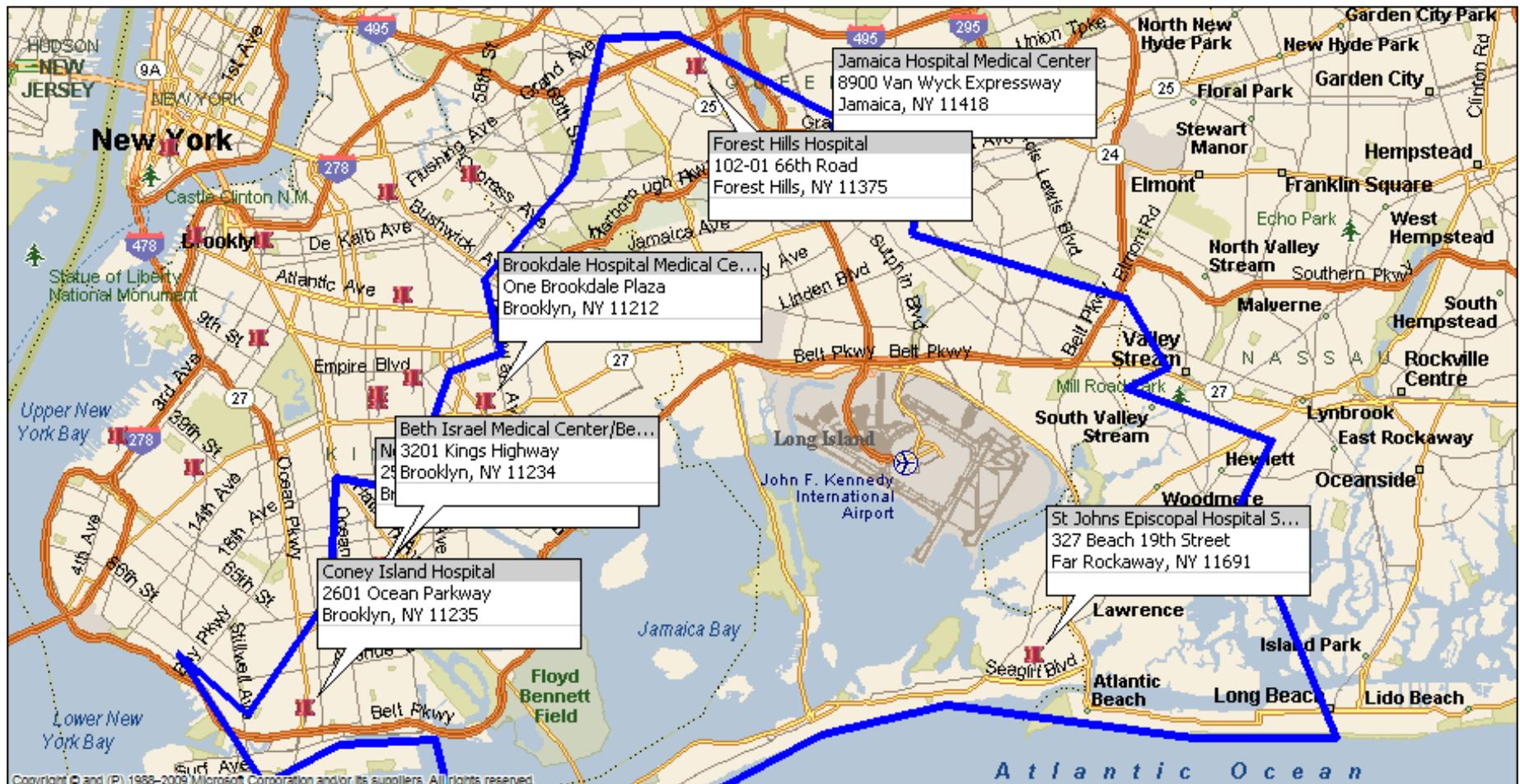
HOSPITAL



- Severe trauma and life-threatening injuries, as well as less serious conditions
- Surgical services

Rockaway West: Hospitals within a 25 mile drive

7 hospitals within a 25 minute drive sufficient day to day, but insufficient for population during large emergencies



Fragmented choice of health services; Problem in an emergency

Local Hospitals

- Peninsula Hospital
 - Primary provider on peninsula
 - Closed in 2012

Other Health Services

- 4 diagnostic/treatment centers (primarily physical therapy)
- 4 long-term care providers

Rockaway West Resident Hospital Usage (2011)

Facility	Patient volume*
Peninsula Hospital Center, Far Rockaway (closed 2012)	22%
St. John's Episcopal Hospital, Far Rockaway	15%
Kingsbrook Jewish Medical Center, Brooklyn	6%
Other	57%

* By inpatient days

Source: Statewide Planning and Research Cooperative System (SPARCS), New York Department of Health

An aerial, high-angle photograph of a coastal city, likely Miami, showing a dense urban area with many buildings, a large beach, and the ocean. The image is tilted slightly to the right and has a light, semi-transparent overlay.

Agenda

1. Project Update 7:00 – 7:15
2. Initial Strategies & Projects 7:15 – 8:15
3. **Q&A and Next Steps** **8:15 – 8:30**

Q&A and Next Steps

Public Meeting

- Approach
- Next Steps

General Questions?

Next Steps

- Committee Meeting early/mid December?

An aerial, high-angle photograph of a coastal city, likely New York City, showing a dense urban area, a large body of water (the Hudson River), and a prominent bridge (the George Washington Bridge) crossing the water. The image is tilted at an angle, and the sky is a clear, bright blue. The text "THANK YOU" is overlaid in the center in a large, white, sans-serif font.

THANK YOU