
Shore Parkway Greenway
Greenway temporarily not ridable due to a beach replenishment project. Riders must walk bikes on the beach.
Riis Landing Ferry Service is temporarily closed due to damage during Hurricane Sandy. Temporary Ferry Service is provided at Beach 108th st. New York Beach Ferry service varies seasonally. For schedules and additional info visit: seastreakusa.com or call 1-800-262-8743.
Rockaway Point Blvd. is the suggested route through Breezy Point
Use West Sidewalk
1. Floyd Bennett Field
2. Marine Park
3. Plumb Beach
4. Fort Tilden
5. Jacob Riis Park
6. Rockaway Beach
8. Canarsie Pier
Borough Park
Washington Cemetery
Midwood
Ocean Parkway
Gravesend
Homecrest
Sheepshead Bay
Brighton Beach
Manhattan Beach
Gerritsen Beach
East Flatbush
Flatlands
Marine Park
Mill Basin
Mill Island
Georgetown
Paerdegat Basin
Paerdegat Basin Park Preserve
Canarsie
Canarsie Cemetery
Canarsie Beach Park
Bergen Beach
McGuire Fields Park
Aviator Sports
Salt Marsh Nature Center
Fresh Creek Nature Preserve
Brooklyn Sports Club
Starrett City
Penn and Fountain Restoration Sites
Belle Harbor
Rockaway Park
Neponsit
Riis Landing
Breezy Point
Avenue H
Avenue 1
Farragut
Flatlands Ave.
Rockaway Pkwy
102nd St.
108th St.
80th St.
Seaview Ave.
Fillmore
Avenue T
Avenue U
Flatbush Ave.
Bedford Ave.
Ocean Pkwy
5 mi to Prospect Park
Gerritsen Ave.
Emmons Ave.
Rockaway Point Blvd.
Beach Channel Dr.
Rockaway Beach Blvd.
2.4 mi
1.3 mi
2.5 mi
1.1 mi
3 mi
1.7 mi
3.8 mi
3.9 mi
8 mi
P105
H109
H110
E106

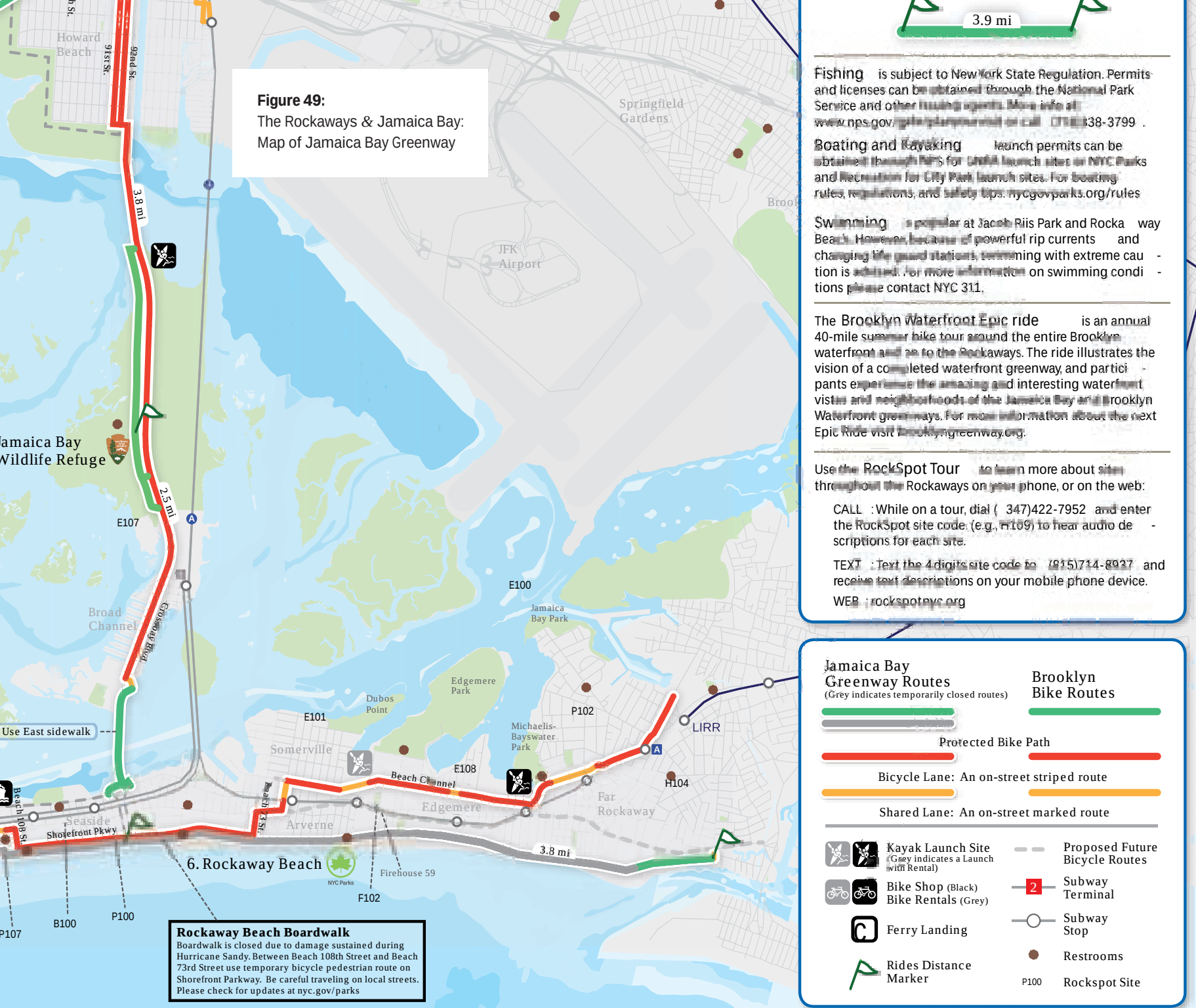


Figure 49:
The Rockaways & Jamaica Bay:
Map of Jamaica Bay Greenway

Fishing is subject to New York State Regulation. Permits and licenses can be obtained through the National Park Service and other [illegible]. More info at www.nps.gov, [illegible] or call [illegible]38-3799.

Boating and Kayaking launch permits can be obtained through NPS for [illegible] launch sites or NYC Parks and Recreation for City Park launch sites. For boating rules, regulations, and safety tips: nycgovparks.org/rules

Swimming [illegible] popular at Jacob Riis Park and Rockaway Beach. However, because of powerful rip currents and changing lifeguard stations, swimming with extreme caution is advised. For more information on swimming conditions please contact NYC 311.

The **Brooklyn Waterfront Epic ride** is an annual 40-mile summer bike tour around the entire Brooklyn waterfront and up to the Rockaways. The ride illustrates the vision of a completed waterfront greenway, and participants experience the amazing and interesting waterfront vistas and neighborhoods of the Jamaica Bay and Brooklyn Waterfront greenways. For more information about the next Epic Ride visit [illegible]greenway.org.

Use the **RockSpot Tour** to learn more about sites throughout the Rockaways on your phone, or on the web:

CALL : While on a tour, dial (347)422-7952 and enter the RockSpot site code: (e.g., H109) to hear audio descriptions for each site.

TEXT : Text the 4 digits site code to (815)714-8937 and receive text descriptions on your mobile phone device.

WEB : rockspotnyc.org

Jamaica Bay Greenway Routes
(Grey indicates temporarily closed routes)

Brooklyn Bike Routes

Protected Bike Path

Bicycle Lane: An on-street striped route

Shared Lane: An on-street marked route

Kayak Launch Site (Grey indicates a Launch with Rental)

Bike Shop (Black) Bike Rentals (Grey)

Ferry Landing

Rides Distance Marker

Proposed Future Bicycle Routes

2 Subway Terminal

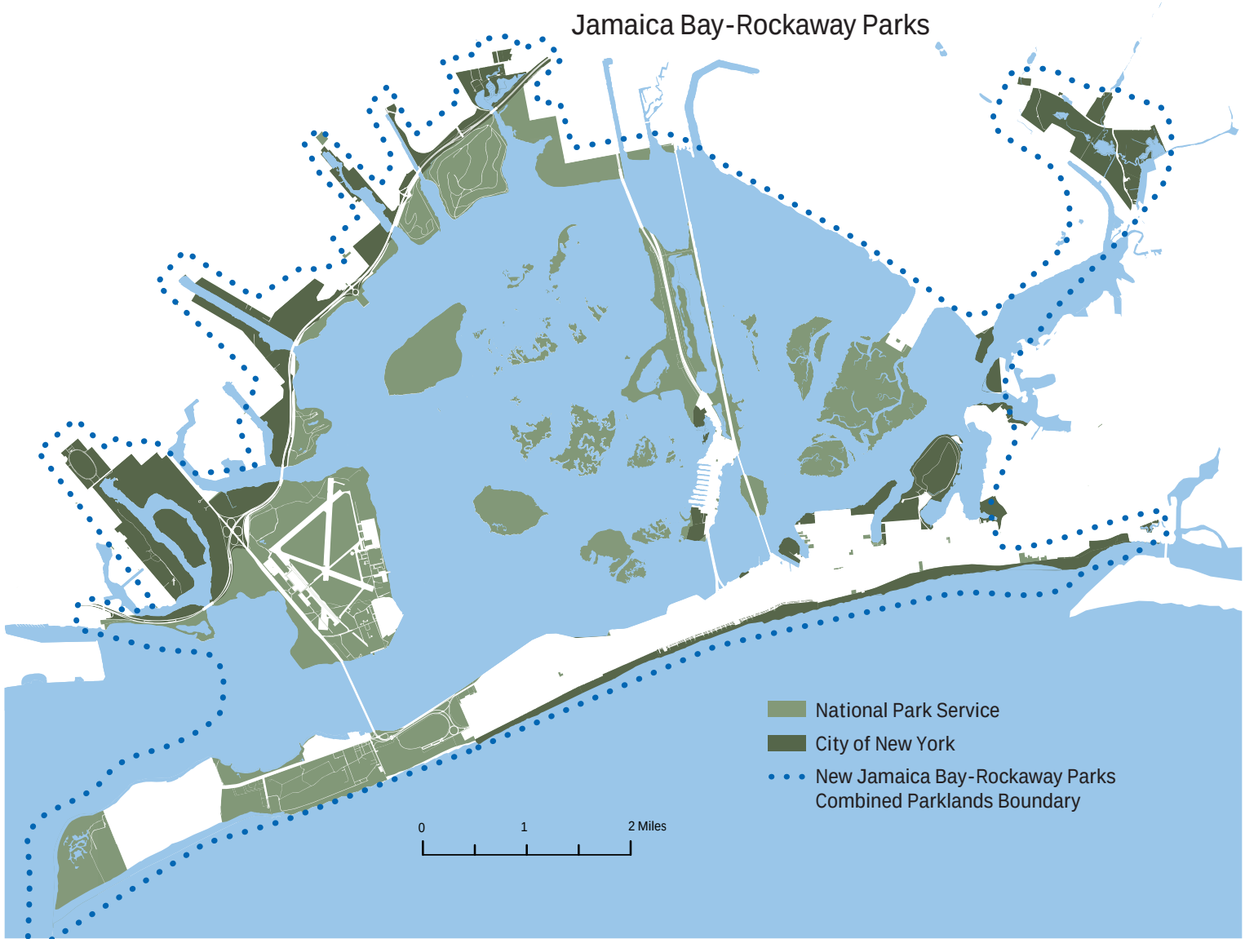
Subway Stop

Restrooms

P100 Rockspot Site

Rockaway Beach Boardwalk
Boardwalk is closed due to damage sustained during Hurricane Sandy. Between Beach 108th Street and Beach 73rd Street use temporary bicycle pedestrian route on Shorefront Parkway. Be careful traveling on local streets. Please check for updates at nyc.gov/parks

Figure 50:
The Rockaways & Jamaica Bay: Map of Joint Partnership Agreement of NYC DPR and NPS Parkland



NYC Department of Parks and Recreation (NYC)

Hurricane Sandy damaged most of the boardwalk on Rockaway beach, which stretches 4.7 miles. The sections that were not damaged had been re-constructed prior to the summer of 2013. The Department of Parks and Recreation (NYC DPR) has developed a plan for the boardwalk to be reconstructed with resilience measures. There is also a study underway for the Rockaway Atlantic Shoreline Dunes by the U.S. Army Corps of Engineers (USACE). This project would need coordination between USACE and NYC DPR. The boardwalk would be reconstructed with a sand infill and the USACE dune.[69] (See Figure) The phases of the reconstruction of the boardwalk will not be complete for another three years, with completion possibly occurring in 2017. (See Figure)

There are plans for local hiring for the construction of this project, which was recommended by Queens Community Board 14.[70] DPR also proposed the construction of a bay-front nature trail that would connect many of the disjointed parks on the bayside of the Rockaways.[71] This proposal also includes resiliency measures (See Figure).

Figure 46:
The Rockaways:
NYC DPR / NYC EDC
Target Construction
Schedule of Rockaway
Boardwalk

Target Construction Schedule

Phase:	Target Start:	Target End:
Phase 1 (**B86-B97**)	Spring 2014	Memorial Day 2015
Phase 2 (**B98-B108**):	Summer 2014	July 4th 2015
Phase 3 (**B108-B126**):	Fall 2014	Memorial Day 2016
Phase 4a (**B73-B86**):	Spring 2015	Memorial Day 2016
Phase 4b (**B60-B73**)	Late 2014*	Memorial Day 2016*
Phase 5a (**B39-B60**):	Fall 2015*	Memorial Day 2016*
Phase 5b (**B19-B39**)**:**	Fall 2016*	Memorial Day 2017*

*Piping Plover Moratorium (Apr – Sept)

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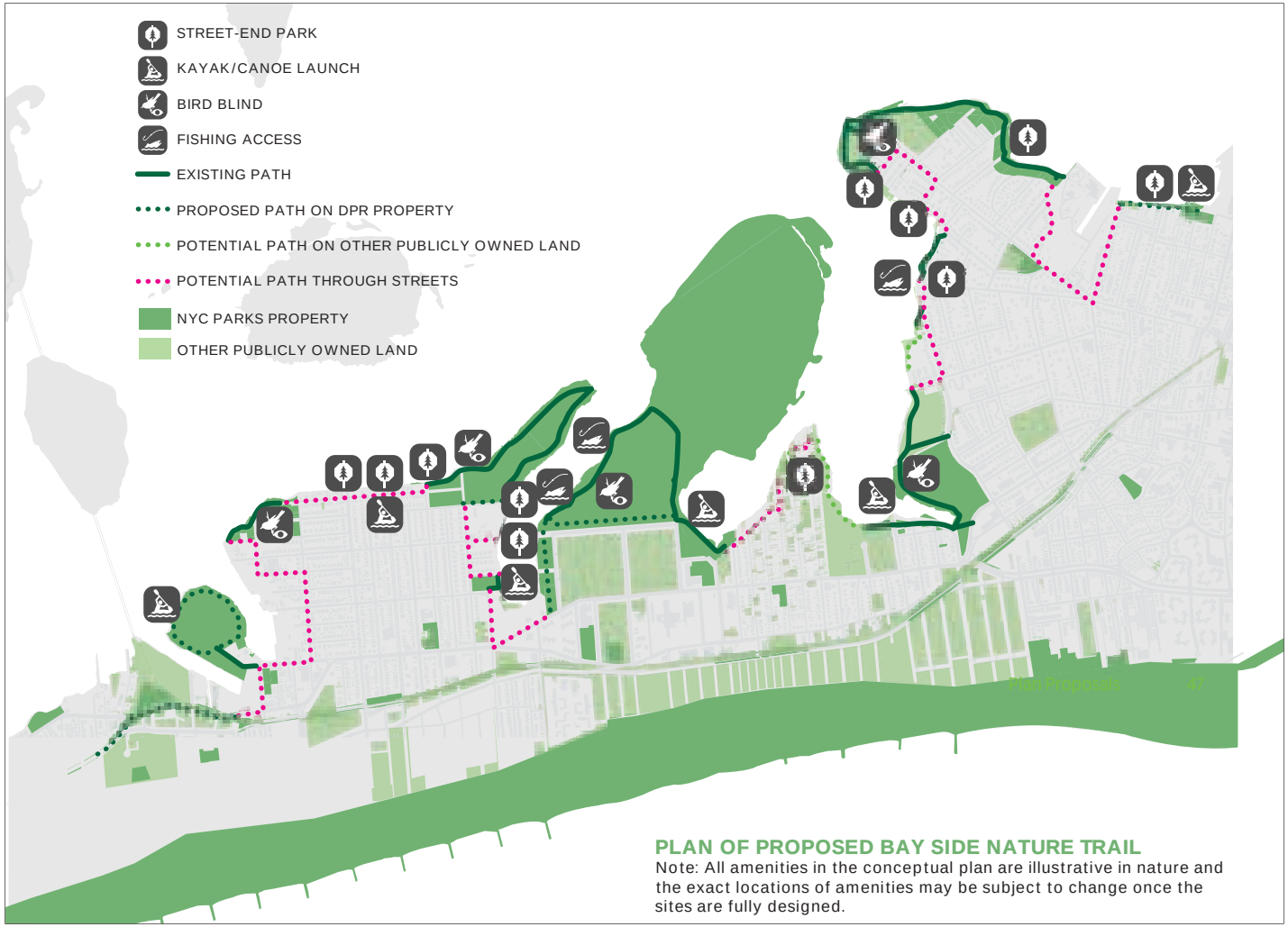
Figure 47:
The Rockaways:
Proposal of NYC DPR
Bay-front Natural Trail



Dog Park on Beach Channel Drive

Plan of Proposed Thursby Basin Park

Key Park Improvements

1. Comfort Station
2. Shade Structures
3. Adult Fitness Area
4. Playground
5. BBQ Area
6. Waterfront Seating
7. Open Lawn
8. Rain Garden
9. Riparian Planting/Riprap
10. Lawn
11. Bermed Lawn

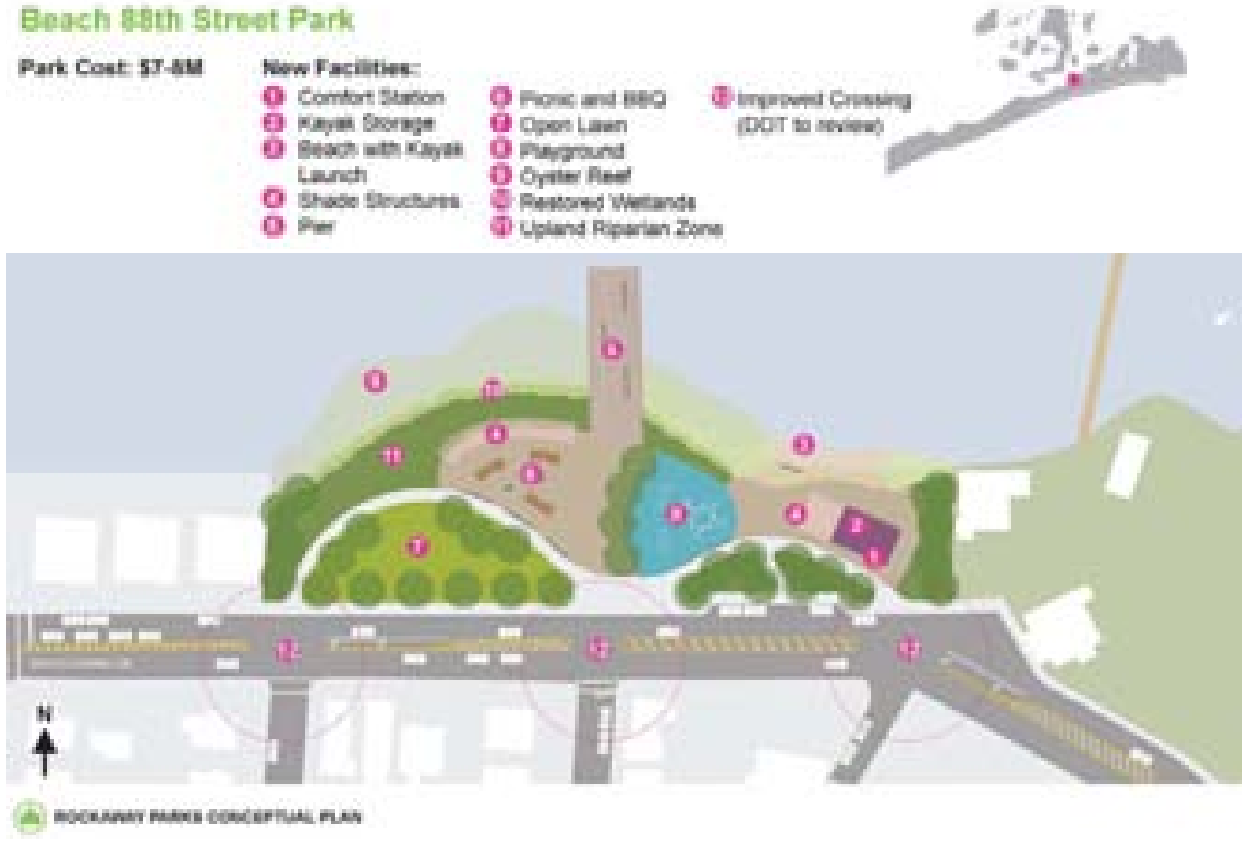
Existing View of the Current Lot for the Proposed Thursby Basin Park

Proposed Thursby Basin Park. Photomontage view is from the west side of the inlet close to the intersection between Thursby Avenue and Beach 62nd Street looking west towards the marina and the Ocean Bay Apartments.

Note: All amenities in the conceptual plan are illustrative in nature and the exact locations of amenities may be subject to change once the sites are fully designed.

Figure 48:
The Rockaways: Proposals/Plans of NYC DPR Bay-Front Parks

Figure 48:
The Rockaways: Proposals/Plans of NYC DPR Bay-Front Parks



QUOTED FROM NYC DPR Rockaway Parks Conceptual Plan for B88th St. Park

Context

Beach 88th Street Park site runs between Beach Channel Drive and Jamaica Bay to the south and north and between Old Beach 88th Street and Beach 89th Street to the east and west. Currently there are no street crossings along this section of Beach Channel Drive, a high tra f c street, making it di f cult to access. The Beach 90th Street A subway stop is only one block away and the Cross Bay Bridge lies four blocks west of the park.

Beach 88th Street Park was recently acquired by NYC Parks and is not yet open to the public. Currently, it is the site of a DEP sewer outfall construction project. The photomontage of the Proposed Beach 88th Street Park does not reflect DEP infrastructure which is not yet complete. The site consists of grassy areas and a gravel beach along the perimeter.

Existing Facilities

• None

Opportunities

Recreation

There is a tremendous opportunity for Beach 88th Street Park to become a beautiful neighborhood park. Community residents provided several ideas, including a new pier and kayaking into Jamaica Bay. The comfort station and kayak storage could be used by local community groups. The playground, picnic and BBQ area, open lawn and shade structures would o er a range of activities for people of ages and families.

Natural Resources and Resiliency

The design for Beach 88th Street Park includes removal of invasive species and introduction of native plantings, serving to restore natural habitat and decrease stormwater runo and heat island e ect. There is an opportunity to introduce an oyster bed and saltwater marsh along the shoreline. This will help to revive native habitat in Jamaica Bay.

Access

Current access to the site is limited because of the high tra f c along Beach Channel Drive. The plan for Beach 88th Street Park could include a designated crossing for safer pedestrian access. Any new crossings would require further review by DOT. The plan also includes a drop o area to allow for the unloading of kayaks and on-street parking for vehicle access.

Cost

The total estimated Beach 88th Street Park improvement costs, which includes soft costs and contingencies, is $7-8 million.

Cost estimates for concepts are based on best available information of the site at the time of publication; estimates are subject to change based on the final capital project design. All costs are in 2014 dollars and are subject to adjustment based on final design and field conditions.

Jamaica Bay Greenway Coalition

The Jamaica Bay Greenway Coalition has been a grassroots e□ort to engage community stakeholders of the 19-mile loop around Jamaica Bay that includes parts of Queens and Brooklyn. The initiative was spearheaded by representatives of Regional Plan Association, the National Park Service Rivers, Trails and Conservations Assistance, and coalition partners, which have conducted broad community outreach in the greenway's neighboring communities. The goal of creating this coalition was to, "identify opportunities for improved access to the greenway and the adjacent sections of Gateway National Recreation Area and NYC Parks, develop community supported visions, and undertake an initial assessment of environmental conditions for the most promising of these opportunities."[72] Workshops have been organized to address the goal and the results of these workshops as well as meetings will be combined in a comprehensive report.

Coalition Partners include: Regional Plan Association; National Park Service; Transportation Alternatives; Brooklyn Greenway Initiative; Millennium Development; Rockaway Waterfront Alliance; Gateway Bike and Boat House; Sebago Canoe Club; Friends of Penn and Fountain Parks; and Partnership for Parks.

Jamaica Bay Science & Resiliency Institute

The Jamaica Bay Science and Resiliency Institute (JBSRI) does not have a physical location, but is currently a partnership between NYC Parks, the National Park Service the New York City Department of Environmental Protection, and the US Army Corps of Engineers with a consortium. This consortium, currently under development, is led by the City University of New York and includes Columbia University's Earth Institute and its Lamont-Doherty Earth Observatory, Cornell University, NASA Goddard Institute for Space Studies, New York Sea Grant, Institute of Marine and Coastal Sciences at Rutgers University, Stevens Institute of Technology, Stony Brook University, and the Wildlife Conservation Society.[73] This partnership also led to the joint management by NYC DPR and National Park Service of parks in and around Jamaica Bay.

The concept behind this research center is to promote the understanding of resilience in the urban ecosystem and adjacent communities. Over the four to five years since it was introduced, the communities around Jamaica Bay are still not being included in broader conversations of the research that is being conducted. Community members have suggested at a Jamaica Bay Task Force meeting that there should be a partnership with the NYC Department of Education to include a mentoring program with JBSRI and children that attend local elementary, middle and high schools.

Jamaica Bay—Rockaway Parks Conservancy (JBRPC)

The formation of the Jamaica Bay-Rockaway Parks Conservancy came out of the formation of the Jamaica Bay Science and Resiliency Institute. This is a public-private partnership that has been established to raise capital for the planning and development of the Jamaica Bay-area parklands and waters. The conservancy is currently chaired by Tom Secunda, vice president of Bloomberg L.P.[74] The board for the conservancy also includes representatives from many of the City's elite not-for-profit organizations and institutions, including Trust for Public Land's Adrian Benepe, former NYC DPR commission.

Photo by Dan Brown © Petitions for the Rockaway Ferry

TRANSPORTATION

As described above, Rockaway is isolated from the rest of New York City. This isolation makes commuting o□, and across, the peninsula very di f cult and time consuming. Public transportation is limited to a very slow cross-Rockaway bus route and an infrequent subway line that can take over an hour to reach the central business districts of Manhattan. Alternative transportation options, such as ferry service, are similarly limited. Biking infrastructure is generally lacking and only used for short trips or recreation.

The result is a peninsula of communities isolated from one another. The following key recommendations seek to unify these communities through simple and e□ective interventions, while also providing residents with improved and a□ordable opportunities for enhanced commuting options.

Objective(s):

Improve connectivity for the residents of Rockaway

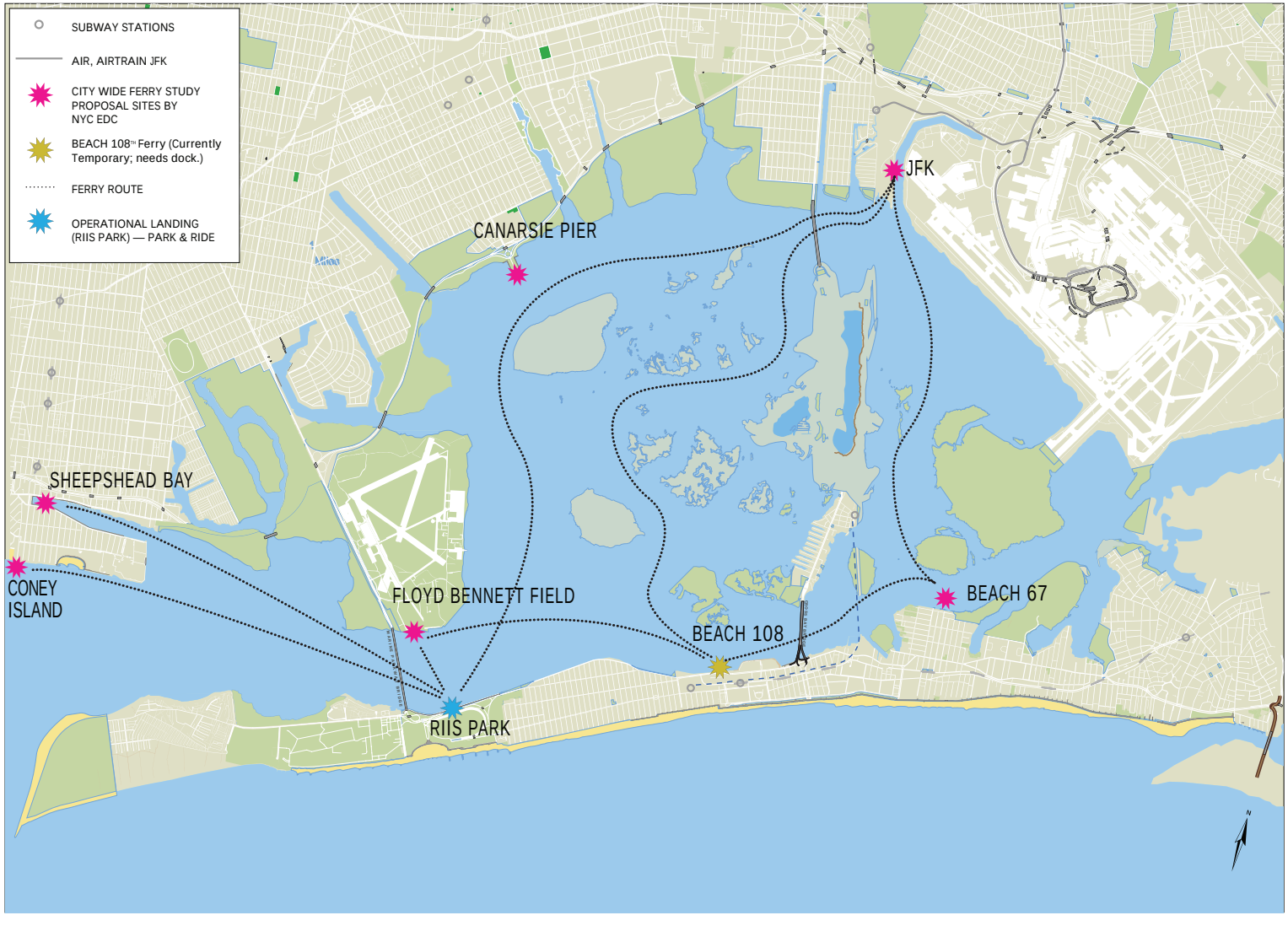
Recommendation 1: Expand ferry service for Jamaica Bay.

As discussed above, Rockaway is currently serviced by the Seastreak ferry service, a state-subsidized service. Departures from Rockaway toward Manhattan occur only eight times daily, with only one ferry terminus for the entire peninsula. Current ferry service does not provide comprehensive connection to other areas within Jamaica Bay, including the major employment hub of John F. Kennedy International Airport, and the recreation areas of Fort Tilden and Floyd Bennett Field. Expanding ferry service throughout Jamaica Bay would capitalize on the growing interest in the Gateway National Recreation Area as a tourist destination, while providing a realistic transportation network along New York's largest waterway.

Identifying and constructing ferry landings for daily, weekend, and seasonal service that connects Rockaway with Jamaica Bay and areas further afield would likely increase commuter ridership while also harnessing the assets of the Jamaica Bay waterways for recreational purposes.

A New York City ferry boat crosses the Hudson with a view of NYC skyline. © iStock

Figure T2:
Map of Potential
Ferry Route (regional)



Objective(s):

Preserve and protect existing communities

Create sustainable economic development

Recommendation 2: Introduce Select Bus Service for Rockaway peninsula.

The New York City Department of Transportation has identified Cross Bay Boulevard as a congested corridor, and has begun studying the feasibility of converting this route to Select Bus Service (SBS), New York City's version of Bus Rapid Transit (BRT). SBS already exists along thoroughfares in Manhattan, the Bronx, Brooklyn, and Staten Island. SBS employs certain aspects of rapid transit - raised stations, pre-board fare payment, separate rights of way - and implements them at the street level. Positive benefits include the following: greater connectivity between major subway and bus lines (for ease of local and city-wide travel); and safety improvements for autos, bus passengers, bikers, and pedestrians through the redesign of streets and thoroughfares. SBS also provides a comprehensive transportation option in the face of natural disasters. Should the subway fail, SBS can quickly transport large amounts of people to safety.

SBS benefits are not only felt by commuters, but also the MTA. Results include: a 5-10 percent increase in first-year ridership, a 15-20 percent increase in overall speeds, and a 95 percent customer satisfaction rate.

Residents of Rockaway should continue participating in DOT outreach (scheduled to begin in the spring of 2014) to ensure that the final alignment and design has had community input. Along with A-train subway service, the Cross Bay Boulevard SBS has the potential to increase the e f ciency of commuting in and out of Rockaway.

Figure T4:
The Rockaways: Map of Q22
Limited Bus Stop Route

Objective(s):

Preserve and protect existing communities

Create sustainable economic development

Recommendation 3: Introduce Limited-Stop Bus Service along the Q22 route.

As discussed, the Q22 is the only existing cross-Rockaway bus line. This bus route reaches from the gateway of Fort Tilden recreation area in the west to Beach 21st street in the east. Currently, the bus runs a local route, stopping every three to four blocks. With approximately 57 stops along its route, total trip time can exceed one hour from end to end. We propose introducing a limited-stop service, such as the Q52 “limited” service bus that connects Rockaway with other areas of Queens. This service would drastically reduce travel times on a route desperately in-need of service enhancement. The limited-stop service would traverse the existing Q22 local route, but would only stop every 15-20 blocks. This would e□ectively reduce travel times to one third or one quarter of the local route.

“Limited” bus routes exist in other locations throughout New York City, providing a faster alternative than local-route buses. As city buses are fully ADA compliant, an enhanced, limited-stop service would provide a fast and reliable cross-peninsula option for all residents. Pursuing this recommendation would require a petition to the MTA to conduct feasibility studies and to dedicate additional buses to the route. Minimal infrastructure and cost is required.

Objective(s):

Preserve and protect existing communities

Create sustainable economic development

Recommendation 4: Re-introduce a full-service H train from Beach 116th to Mott Avenue along the Rockaway peninsula.

The communities of Rockaway have identified fast, reliable, cross-peninsula subway service as a top priority. In the aftermath of Hurricane Sandy, the MTA initiated a cross-Rockaway shuttle subway service. Operating at 30-minute intervals, this H Train provided a lifeline of service in lieu of the then inoperable A-train, which was heavily damaged by the storm. The H shuttle train serviced residents of both the western and eastern portions of Rockaway, and instantly became an asset in mobilizing communities along its route. However, once the A-train service was restored, the cross-peninsula H service was discontinued. Once again, Rockaway residents attempting cross-peninsula travel were forced to venture halfway across Jamaica Bay to Broad Channel station, and then transfer back in the opposite direction via either a Rockaway Park or Far Rockaway-bound train. The journey often takes up to 45 minutes in order to go from one end of the peninsula to the other.

We recommend restoring the H train service that was operational after Hurricane Sandy. This much-needed service provides reliable and e f cient cross-peninsula travel, at less than half the journey time as the current service provides, and is a key mode of transit for disabled residents seeking a fast trip along the route. Infrastructure investment would be minimal, and would involve the allocation of already-existing resources. Maintenance fees would be nominal, as the track already exists. This track, however, is greatly under utilized.

Figure T5:
The Rockaways:
Map of H-Train

Objective(s):

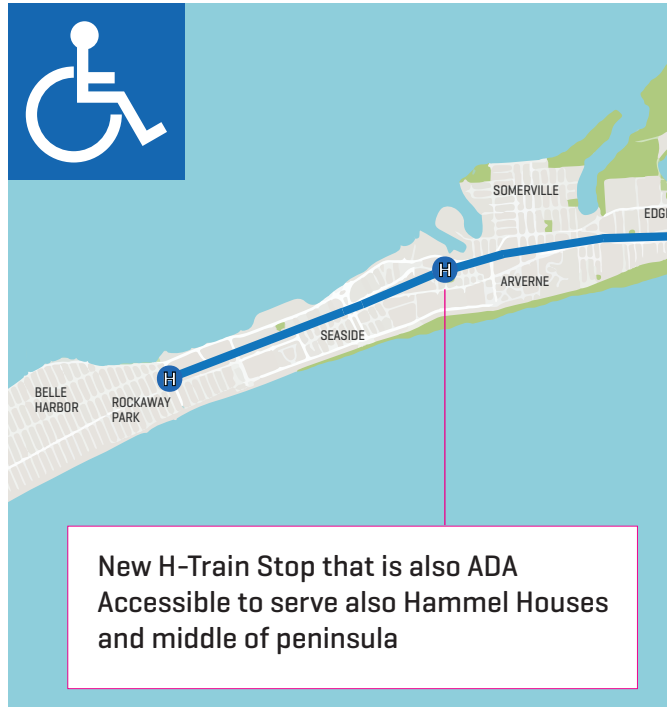
Preserve and protect existing communities

Create sustainable economic development

Recommendation 5:

Study the feasibility of adding an ADA accessible subway stop at Beach 80th street.

This recommendation is to complement the restoration of a full-time, cross-peninsula H train shuttle service summarized above. Including an additional station at Beach 80th street – as part of a full-fledged renovation of the elevated railroad (including extensive improvement and development of sidewalks, bicycle infrastructure, parks, and plazas along the "Underway," a separate proposal hereafter described) would provide another access point for residents in need of ADA-accessible public transportation options. A new station also fills the existing void between Beach 90th and Beach 67th street, should full-time H service be reinstated.



Existing Conditions of where the H-Train stop would be located.

Objective(s):

Preserve and protect existing communities

Create sustainable economic development

Recommendation 6: Expand and improve the Jamaica Bay Greenway and Biking Infrastructure along Rockaway Peninsula.

The expansion and improvement of the biking infrastructure around Jamaica Bay, including Rockaway Peninsula, is already underway. The New York City Department of Parks and Recreation, in partnership with various agencies, including the National Park Service, is completing upgrades and enhancements to trails that run throughout Jamaica Bay. Upon completion, a comprehensive route of biking and walking trails will serve Rockaway and Jamaica Bay as a whole.

Rockaways bike paths need to be improved and integrated. Paths throughout the peninsula are in various forms: old paths with faded markings, informal roads, bike paths that are co-exist with tra f c and are disrespected by motorists, and the now-defunct path along the boardwalk. It is recommended that upgrades to the Rockaway biking infrastructure be identified and scheduled, and the routes linked to the proposed Underway path under the elevated A-train (hereafter described).

Objective(s):

Preserve and protect existing communities

Create sustainable economic development

Recommendation 7: Fund and construct the proposed Underway Path beneath the elevated A-train.

The Underway is a proposed bike and pedestrian path that would run under the elevated A-train's structure, providing a covered, protected place for residents to utilize for both transportation and recreation purposes. As discussed, the Rockaway Freeway currently consumes this space. Taking advantage of its lack of congestion, drivers often speed along this route at speeds in excess of posted limits. The lanes of tra f c vary along this route, and pedestrians are therefore unable to predict tra f c flow. In its current state, the space is quite unsafe for drivers, pedestrians, and cyclists. Reclaiming this space for the use of Rockaway residents would provide an opportunity for placemaking, where the community could control the design of the space.

Transforming the space into an area for pedestrians and cyclists would have little impact on vehicular tra f c, as actual vehicular usage along the route is low, and tra f c could easily be diverted to the other two boulevards running parallel to the freeway.

RWA has begun the process of campaigning for this space to be a part of the Jamaica Bay Greenway, and community support for the project is high. One of the steps needed is also to secure funding and have the City committed to seeing the Underway project completed. Doing so would o□er a common-sense solution for this under utilized space, and is a major step toward enhancing the quality of life for Rockaway residents.

Figure T7-A:
The Rockaways: Underway project design in Section C (See **Figure RF-3**)

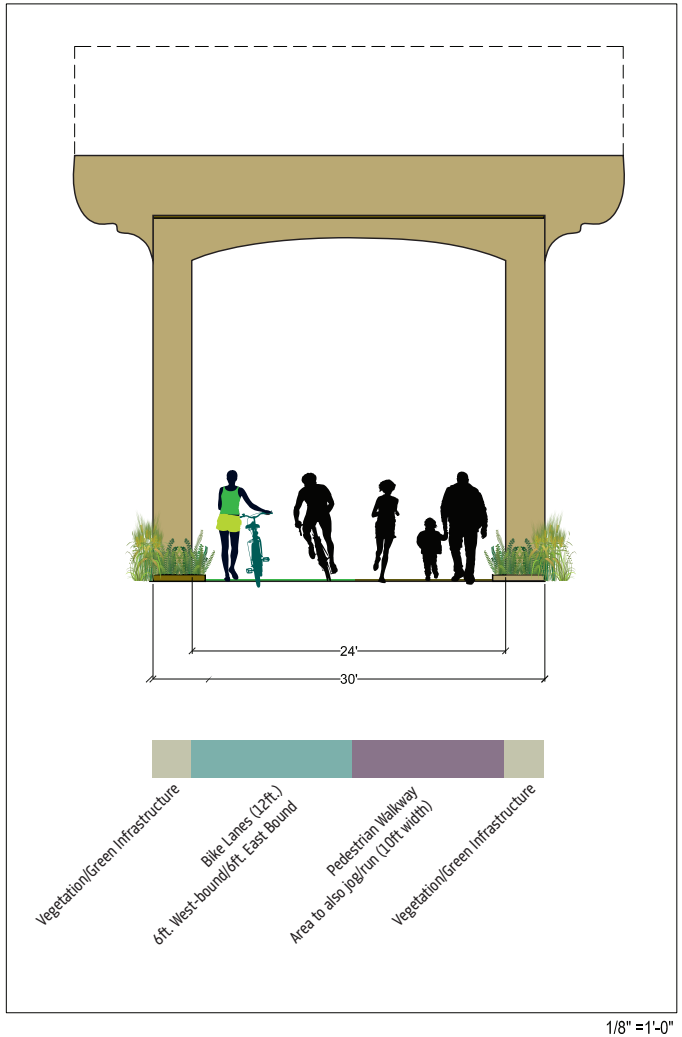
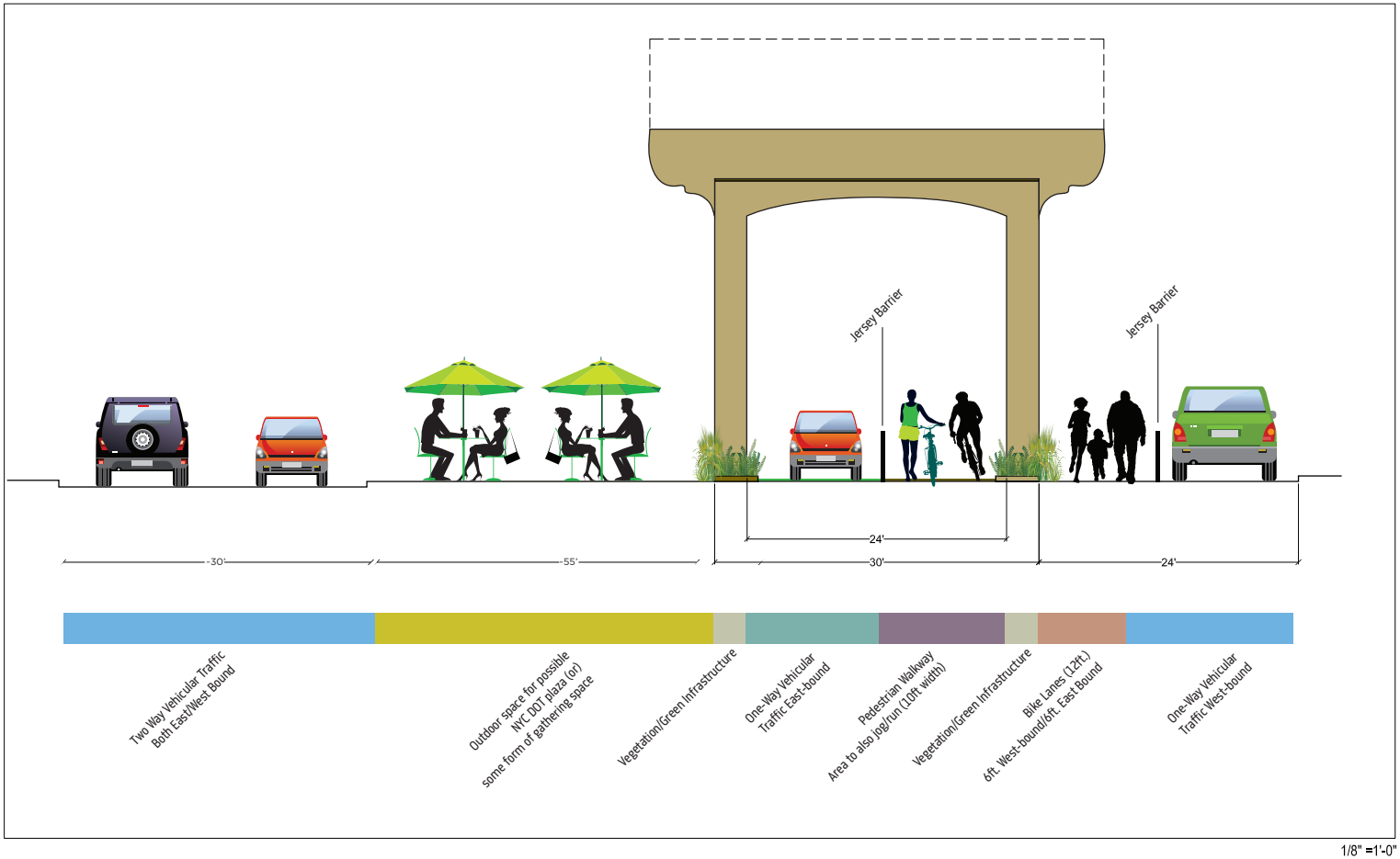


Figure T7-B:
The Rockaways:
Underway project
design in Section C
(See **Figure RF-4,5**)



iStock © CitiBike Bike Share Program

Objective(s):

Preserve and protect existing communities

Create sustainable economic development

Recommendation 8: Study the Feasibility of a Local and Independent Bike Share System.

Bike share systems are gaining popularity worldwide. In New York City, the Citibike system has seen major success in its first year of operations. It is unrealistic, however, to suggest that stations should make it to Rockaway in the coming decade. Residents seeking the benefits of a bike share program (namely, low operating costs and freedom from constraints of ownership) might organize a study to devise a less formal, independent system for their community.

A bike fleet, such as the ones found on college campuses, requires little infrastructure and upstart costs. Placing between five and ten stations at various points throughout Rockaway, and providing participants with a lock and key, is the basic step to beginning a system. A Rockaway bike fleet would allow for neighborhood-level oversight of infrastructure, and would provide a powerful opportunity to partner with local businesses for maintenance and other perks.

Coupled with the proposed expansion of the biking network throughout Jamaica Bay, and a completed Underway project, bike sharing through the Rockaways has a practical future.

A second key recommendation under bike sharing is the development of a biking retail hub, either along the Underway or the to-be-completed boardwalk. Providing a space for biking enthusiasts to shop for supplies, maintain their bikes, take a rest and stop for a meal is an essential element of creating a biking economy in the area. Furthermore, bike lanes and a bike-share system would provide a useful link in a multi-modal system in which commuting residents bike to the train, bus, or ferry.

HOUSING

The existing conditions research indicated that low- and moderate-income communities in eastern Rockaway face the dual threat of climate-change related storm events and gentrification-induced displacement. To help mitigate these threats, we propose several interventions: improving the a□ordability of future development, especially Arverne East; developing additional a□ordable, resilient housing on NYCHA campuses; and dedicating city-owned vacant lots to the construction of workforce housing using resilient designs. Figure H-1 depicts the housing issues and assets in the study area.

Objective(s):

Strengthen resiliency

Recommendation 1: Work with NYCHA residents to study the possibility of elevated senior housing above under utilized parking lots on NYCHA campuses.

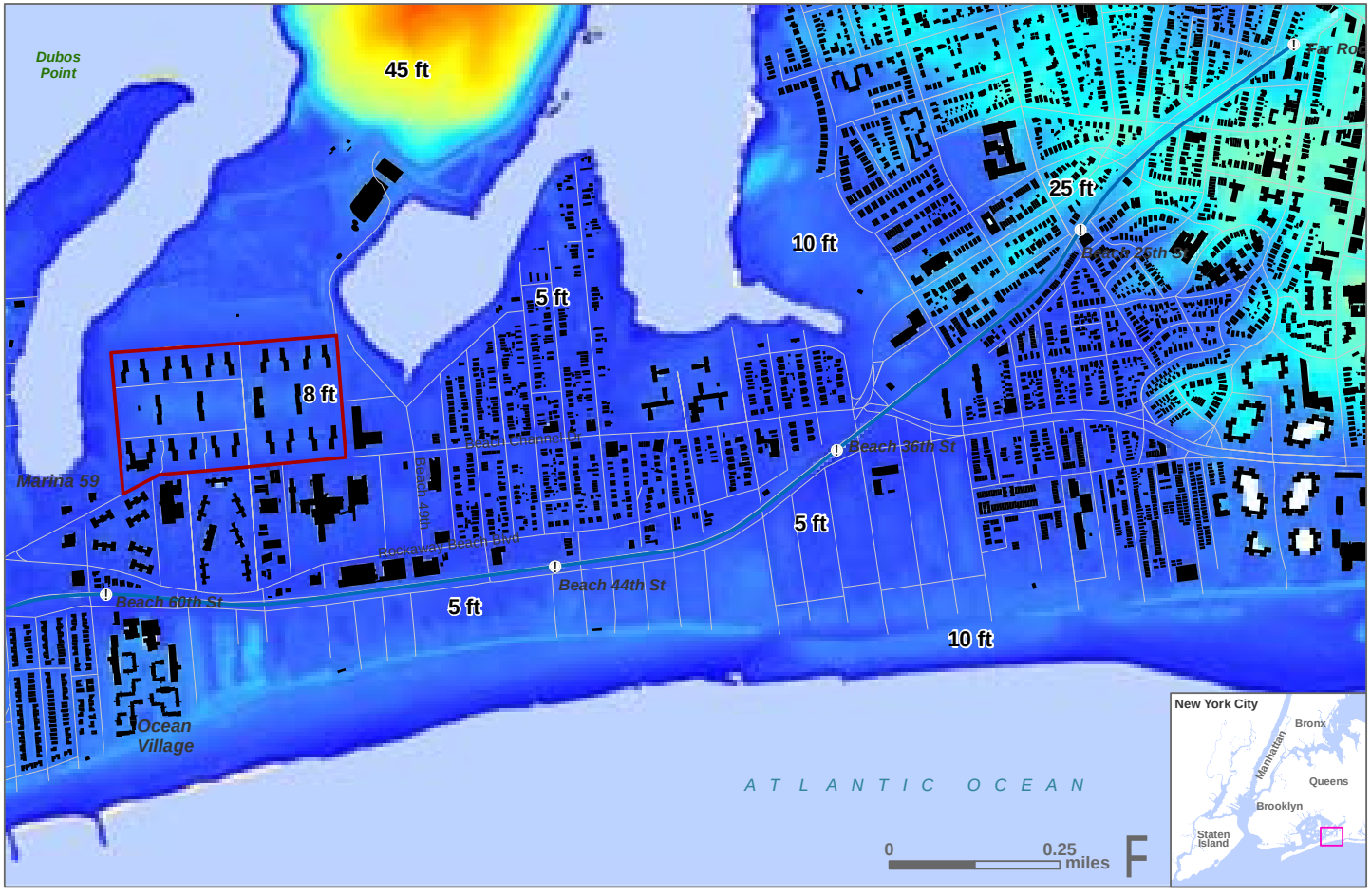
While NYCHA buildings represent some of the sturdiest structures on Rockaway, units on the ground floors face the threat of flooding in the event of a large storm. Additionally, elderly residents of NYCHA buildings often have larger apartments than are necessary, as family members move away over time, though they may desire to stay in their community. Finally, it is a challenge to evacuate elderly residents from upper floors of elevator buildings if the elevators lose power during a storm event. See Figure H-2 for a depiction of elevation in the study area – this figure depicts how vulnerable Rockaway is to storm surge.

For these reasons we propose that architects and planners work with NYCHA residents to assess if and where the development of a□ordable, senior housing above the under utilized parking lots on Rockaway's NYCHA campuses would be appropriate.

These developments could be designed with one floor of studio and one-bedroom units, and would be connected by an ADA certified ramp to grade, obviating the need for costly elevator construction and maintenance. Elderly NYCHA residents could then move into these units, freeing up larger units in existing NYCHA buildings for wait listed families that need larger units. Additionally, this extra capacity would allow the ground floor units of NYCHA buildings to be vacated so that a storm event would not damage dwelling units and delicate material, such as drywall.

Figure H-1:
Arverne East & Edgemere:
Vacant Land, NYCHA campuses,
and Arverne East Development

Figure H-2: Arverne and
Edgmere Elevation Map



Building Footprints
NYCHA Ocean Bay (Bayside)

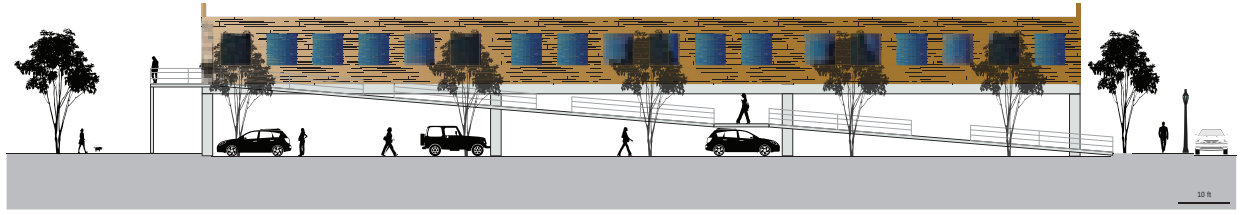
City Street
A, Rockaway
Subway Stations

Elevation
High : 68.5 ft
Low : 0 ft

4/8/2014

Sources:
NYCHA 2011
PLUTO 2013
DOITT 2014
NOAA LIDAR 2012

See Figure H 3 for an elevation of the proposed development design.



As shown in this figure, gaps would be placed in the railing of the ramp that leads to the residential floor so that residents could be evacuated by boat during a catastrophic storm event. In keeping with the context of their surroundings, these infill developments would mirror the Modernist design of existing NYCHA structures on Rockaway, supporting upper floors with concrete pilotis. See Figure H-4 for a rendering of the proposed development. Alternatively, since retail uses are permitted at the ground level, these could occupy the spaces on grade, with the senior residential units above. In this case retail would serve as a sacrificial use, as it would be exposed to storm surge.

On Rockaway, the Ocean Bay (Bayside) NYCHA campus is appropriate for this type of infill development. During site visits it was apparent that two large parking lots (~70,000 square feet each) and two smaller parking lots (~10,000 square feet each) are very under utilized, with only one or two vehicles in each parking lot. See Figure H-5 for a photograph of one of the under used parking lots. With a single floor of development on all five lots, the proposed infill development could accommodate approximately 170 one bedroom and studio units, an average of 800 square feet each.

Figure H-5:

The Ocean Bay (Bayside) Development has approximately 200 units on the ground floors of its buildings. This development concept could replace all ground floor units by making some of the units smaller than 800 square feet or by building two or more floors of residential development over each parking lot. Ocean Bay (Oceanside) also has approximately 60 units on its ground floors – building two or more stories of development would replace all the ground floor units from this development as well. Based on a visual examination, the Beach 41st St Complex does not appear to have any units on its ground floors.

However, we do not propose the elimination of any parking – the new construction would be entirely one floor above grade, with parking preserved underneath. While we are only proposing a single floor of development with studios and one-bedroom units, the design concept could be extended vertically, with more floors of development. Construction of this design would require a zoning change, given that this campus is zoned R4 with a maximum permitted residential FAR of 0.9 and an existing built FAR of 0.99. See Figure H-6 for a map of residential FAR available and allowed at the di□erent NYCHA campuses in the area.

While NYCHA's capital budget is severely underfunded, the agency could partner with local community development corporations to pursue tax credit financing. Additionally, the City itself under Mayor de Blasio's housing plan will be allocating capital to new housing, and this could serve as a test case for new a□ordable, resilient housing. See Figure H-7 for a site map in which the potential development sites have been identified. The NYCHA campuses on Rockaway are purely residential, and this has created a situation where residents must walk long distances to access commercial services. As a sub-recommendation, we propose a commercial corridor be developed along Beach Channel Drive. Figure H-7 contains a delineation of our proposed corridor. Rents from these developments could help to fund the under-maintained NYCHA buildings. The challenge is that while Beach Channel Drive is the most appropriate location for commercial services – given its status as a main thoroughfare located between two NYCHA campuses – developing commercial structures here would require paving over existing recreational green spaces of these NYCHA campuses. Another option is that ground floors of NYCHA buildings could be converted to commercial uses, as these floors might otherwise be lost to rising sea levels.

A collaborative planning and design process should be implemented with NYCHA residents to gauge their enthusiasm for any development at all, as well as their preferences for di□erent design and development options. Figure H-8 is a rendering of how commercial infill can enliven spaces, courtesy of the Congress for the New Urbanism.

As second sub-recommendation, we propose the development and implementation of an educational campaign that would inform the public housing community on evacuation and emergency preparedness - before, during and after disasters. We propose that this educational campaign be a partnership between tenant, youth associations and CDCs to guarantee that all residents will get involved. This program could complement existing O f ce of Emergency Management e□orts to promote preparedness at the grassroots level.

CASE STUDY

SNAP Seattle, WA

Seattle, Washington's Seattle Neighborhoods Actively Prepare (SNAP) is a successful educational campaign that informs and protects residents in Seattle from the family to the neighborhood level. The program is an e f ort to encourage residents to get together, get organized and get prepared for a natural disaster. Handouts, emergency kits and a campaign strategy are provided from SNAP so that residents will be better prepared at home with a family plan and have an emergency supply kit.

Objective(s):

Preserve and protect existing communities

Create sustainable economic development

Recommendation 2: Rethink proposed development plan for Arverne East in light of likely gentrification-induced displacement of surrounding residents.

Arverne East is a proposed housing development to be built on an 80-acre Urban Renewal Area in the heart of the study area. Figure H-1 depicts the extent of the development. The proposal calls for 1021 units to be constructed with a variety of designs, from row-houses to apartment buildings. The housing would be pre-fabricated o□-site and then moved into place, a construction technique that raises questions about whether the construction jobs will be union or non-union, and whether these will be living wage jobs. Figure H 9 is the winning proposal for Arverne East. The area would require construction of new infrastructure, a requirement that makes the construction of a□ordable housing more challenging given the capital required.

Figure H-10 and H-11 are photographs of the Arverne East site, an area that has been reclaimed by nature.

The entire development site is extremely vulnerable to storm surge, as indicated by Figure H-12, an elevation map of the area in which Arverne East is outlined in red.

While the vulnerability of the site is troubling, what is much more problematic is the income mix of the residents. At present, 43 percent of the development's units will be a□ordable to households making no more than 130 percent of Area Median Income (AMI). For 2014, $83,875 is 100 percent of AMI, so 130 percent of AMI is $109,037, a level well above what local residents can a□ord. The remainder of units will be market-rate. Furthermore, the AMI should be adjusted to reflect local incomes, as is discussed in the next recommendation. Beyond the pricing, the development is designed to trigger further waves of development and attract 'creative' young people to the area; in other words, it is designed to spur gentrification.

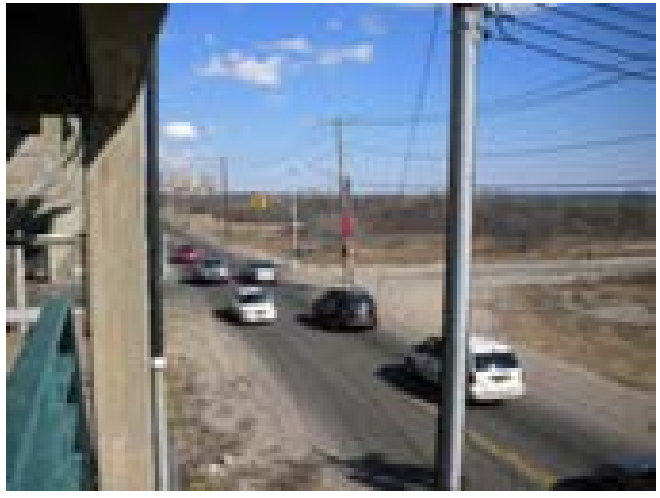
From the project book: “Three ‘centers’ within the development - the Learning Center with adjacent communal gardens, the central boulevard with the adjacent public and commercial functions, and the wetland park around w. 106 with child-based services including day care, playgrounds, and sports fields – will trigger further urban development.”

Additionally, “We see great potential in welcoming and providing adaptable, a□ordable opportunities for the young, creative, and leading individuals, as they have proven to be driving forces within communities.”[76]

The local community is extremely vulnerable to gentrification-induced displacement, as depicted in Figure H 13 (2010 tenure by block). This development will undoubtedly have the intended consequence; it will bring further development and ‘creative’ people to the area, making it di f cult for low- and moderate-income residents to continue to a□ord the community. Furthermore, it reinforces the notion that our coastal areas are to be reserved for the rich, policy established, in part by accident, by the Biggert-Waters insurance reform act of 2012.

Figure H10:

Figure H11:



If the proposal remains unchanged, we recommend that the entire project be scrapped because of the negative consequences it will almost certainly have for the existing community. If the project were to proceed, we would recommend the following changes:

- **Deeper affordability.** Making units affordable at 130 percent of AMI is not affordable for locals. We reinforce Councilman Donovan Richards' call for deeper affordability in the project[77], even if this means the City contributing equity. An alternative would be a 50/30/20 development, in which 20 percent of units are reserved for low income, 30 percent for middle income, and 50 percent for market rate. This contrasts with the development's current program of 57 percent market rate and 43 percent middle income.

- **Local Hiring.** To ensure that the local community benefit economically from Arverne East, we proposed that the City implement a 15 percent local hiring requirement for all multifamily housing projects that receive financial assistance from the City. This would require a training program to be effective. Construction trades unions could work with local non-profits to train unemployed or underemployed individuals as apprentices to work on the project; this would serve as a path into the construction trades for locals. Additionally, this could be part of a larger effort to involve the unions in affordable housing construction projects.

At present, there is an effort to create a Community Benefits Agreement that would ensure that the local community benefits from the Arverne East development.[78] Community Benefits Agreements have laudable goals, but enforcement is difficult, as the community groups may not have any legal recourse if the developer chooses not to honor the agreement, and even mounting a serious challenge requires a community group to be vigilant for decades after the development. A preferable option is to take the key issues, such as local hiring and deeper affordability, and make them part of citywide policy. Enforcement would then be done by agencies, not by community groups.

Objective(s):

Preserve and protect existing communities

Strengthen resiliency

Recommendation 3: Dedicate City-owned vacant lots to workforce housing and storm-water management with reinforcement of the bayside coastline. Use a Locally-Adjusted Area Median Income to determine affordability levels.

North of the A-train, between Beach 49th Street and Beach 43rd Street, the City owns a large number of vacant lots. See Figure H-14 for a map of vacant land by ownership in the study area.

Additionally, as can be seen in Figure H-12, this area is particularly susceptible to climate change given that the whole area is only approximately five feet above sea level. Sea levels have been predicted to rise at least 2.3 feet in the New York City area over the next 100 years.[79] A large number of these vacant parcels are located directly adjacent to Jamaica Bay.

We propose that the City dedicate these lots to resiliency measures, such as bio-swales and water-squares, and rezone the area as parkland. This land will be needed as a buffer to flooding in the event of the next large storm event. See Figure H-15 and H-16 for examples of multiple function water squares.

To prevent the gradual erosion of this residential neighborhood by the bay, we also propose the reinforcement of the coastline with riprap, a strategy that has proved successful in Red Hook, Brooklyn. See Figure H-17 for a map of the proposed intervention. With the large number of remaining parcels, we propose that the City partner with non-profit development organizations to develop workforce housing on site. This is particularly needed because of the low rate of homeownership in the area (see Figure H 13), making the neighborhood very vulnerable to gentrification-induced displacement.

Workforce housing targets moderate income families, from 80 percent to 120 percent of Area Median Income, a segment of the population that is often overlooked by other programs. However, in our area such development should target 80 to 120 percent of local median income, a far more aggressive approach given how much lower the local median incomes are than that of the New York City HUD Metropolitan Fair Market Rent/Income Limits Area, which includes Putnam, Rockland, and Westchester Counties.

At present, 100 percent of Area Median Income is $83,875, an income well above median incomes in our study area. See Figure H-18 for a map of median household incomes by tract across the Rockaways.

Rather than use incomes from so far afield to determine the income limits for a□ordable housing developments, we propose using the household median income from the Community District to determine a□ordability; this would be termed the “Locally-Adjusted Area Median Income.”

Figure H20:

CASE STUDY

Via Verde Bronx, NY

The Via Verde development, located in the Bronx, NY, has a mixture of housing types, with 71 workforce units and 151 affordable units.[82] Funding came from federal, state, city, and private sources.[83]

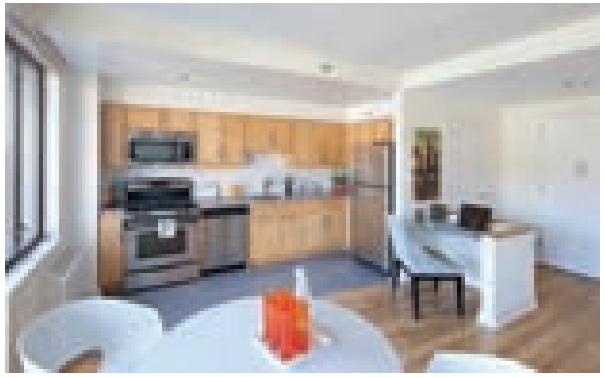
AFFORDABILITY

- Workforce co-op units:
- 1 BR: $78,894 to $134,585
- 2 BR: $146,032 to $179,446
- 3 BR: $192,750

DEVELOPMENT COSTS

- $98.8 million

Buildings and rooftops offer expansive views of permanent open space to the south of the site. Green roofs provide outdoor space for recreation and gardening. (David Sundberg)



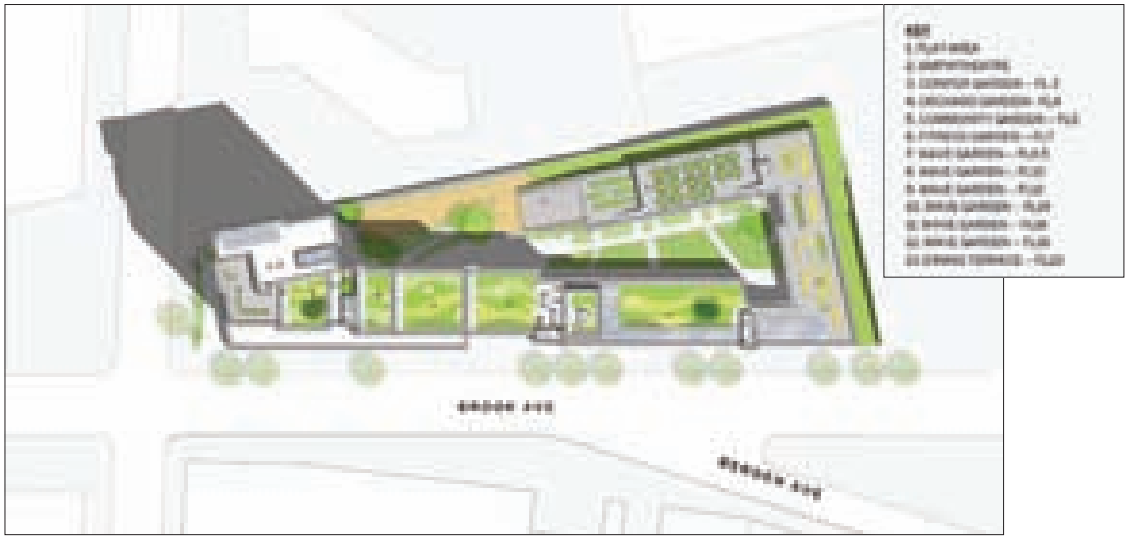
Units are bright and open. Kitchens feature Energy Star appliances. A homework desk gives students a place to work without being isolated from household activity. (Ruggero Vanni)

Via Verde originated in a design competition held by the city of New York and the local chapter of the American Institute of Architects. A series of green roofs is the organizing elements of the design. (David Sundberg)

CASE STUDY [*Cont'd*]

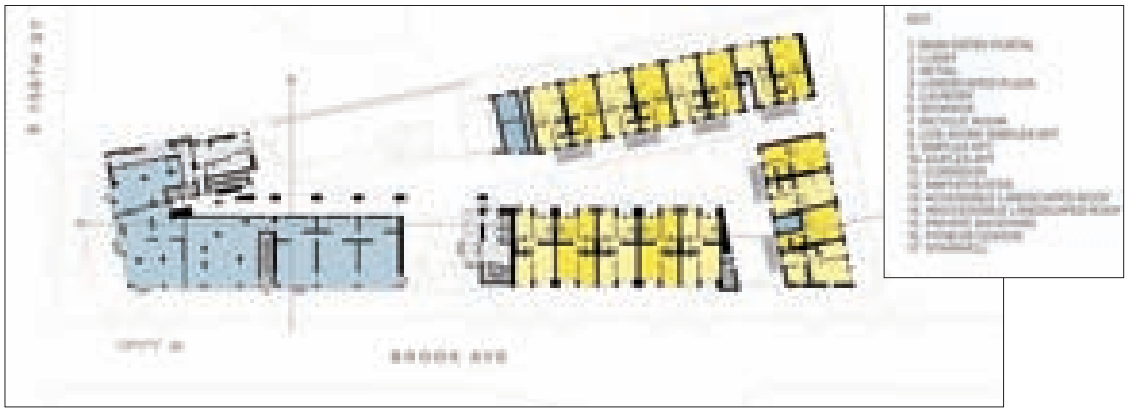
Via Verde *Bronx, NY*

Via Verde's garden club cares for the vegetable gardens on the fifth-floor roof. (David Sundberg)



Site map. (Dattner Architects/Grimshaw Architects)

Via Verde's garden club cares for the vegetable gardens on the fifth-floor roof. (David Sundberg)



Building plan. (Dattner Architects/Grimshaw Architects)

We present two possible designs for future construction in the study area. Figure H-19 (to the left) depicts The Resilient Home by Sustainable Tv[80], which has a cost of $50,000 per unit, excluding land. This single-family home incorporates solar panels, a grey-water system, flood-proof foundation materials, and is elevated to at least seven feet above grade, protecting occupants from storm surge.

Figure H-20 depicts the Bayside Bunker housing design,[81] designed for Breezy Point by two Australians, Rayne Fouche and Larissa Searle. This freestanding single family home has an internal garden, a grey-water system, a solar energy system, and costs $150,000. Obviously, Bayside Bunker is elevated a full story above grade. (See Appendix A for a table of potential funding programs for the development of workforce housing in the study area.)

For ease of computation, Community Districts are very nearly coterminous with Public Use Microdata Area, the smallest area at which non-Census researchers can calculate median income because of privacy concerns. For the Rockaways, the Locally Adjusted Area Median Income would be $47,218.

Objective(s):

Strengthen resiliency

Recommendation 4: Implement a Coastal Resilience Special District to require resilient housing design.

To ensure that future development in the study area adequately protects residents from the physical and economic danger of storm surge, we propose that a Coastal Resilience Special District (CRSD) be overlaid on the existing zoning of the study area. Across the City, CRSDs could be mapped over coastal communities that are deemed vulnerable to flooding or storm surge. The CRSD would prohibit ground floor residential units, while allowing FAR generated on lower floors to be transferred above the structure. As a result, the property owner has the ability to utilize the ground floor as a protective level or flood barrier infrastructure without sacrificing the FAR that he or she would normally be permitted to use. Existing structures would be grandfathered.

This overlay is unlike others because it has the capacity to mitigate the vulnerability of residential areas within critical flood zones. The CRSD gives an area the ability to protect infrastructure without compromising its ability to build to its maximum development potential. This Special District could serve as the vehicle for anti-gentrification zoning, as it could incorporate such features as anti-harassment zoning, pioneered in the Special Clinton District.

ECONOMIC DEVELOPMENT

The communities of Rockaway peninsula have identified economic development as one of their top priorities. Our existing conditions report identified wide disparities in the incomes of Rockaway residents. We therefore suggest a number of interventions to spur economic development on Rockaway, specifically on the eastern portion of the peninsula.

iStock © "Richmond, BC, Canada - July 08, 2014: Unidentified people enjoying sunny day in Steveston Village in Richmond, BC on July 08, 2014. Steveston is a historic fishing village. It has become a popular place to visit and live."

Objective(s):

Create sustainable economic development

Recommendation 1: Remediate and revitalize vacant industrial site for the creation of a "Creative Commons."

Within Rockaway communities, businesses face challenges because of their limited capacities of scale. This includes the commercial area surrounding the Arverne-By-The-Sea development, where the local market has been unable to support new business development. Although the Arverne and Ocean Village communities are relatively small in order to create a destination retail market, they o□er considerable opportunities that can be centered on the needs of the community. Utilizing the numerous vacant parcels in the vicinity, and employing low-cost, limited investment business opportunities could revitalize the local economy with requirements for local hiring and job training.

Directly adjacent to the neighborhood of Arverne, towards Rockaway Beach, there are two vacant industrial sites in need of brownfield remediation. One of the industrial sites is located on Amstel Boulevard between Beach 73rd and Beach 74th Streets. The other is located on Beach Channel Drive and Beach 75th Street. We propose that these two industrial sites be utilized for the creation of an urban farm and food business incubator, a green jobs training center, as well as a local brewery. A local brewery has already expressed interest in the site located at Amstel Blvd.

The urban farm and food business incubator includes five major components:

1. A rehabilitated industrial building used as an aquaponic farm and fishery;
2. Indoor space for community gardens;
3. Rental space for small business incubators;
4. Space and educational opportunities for youth programs and job training; and,
5. Waste from farming and local businesses, such as breweries, being used to power site through the use of an anaerobic digester.

The proposal seeks to achieve the following:

- Supply local markets and restaurants with fresh produce;
- Support a local, sustainable economy with an emphasis on hiring within the community and youth education programming;
- Promote social connectivity and community linkages through sense of place and purpose;
- Demonstrate economic resiliency with a focus on environmental resiliency; and,
- Interconnect economic activities through a cluster effect - businesses relying on each other through shared resources and reduced costs.

The proposal has the potential to lead to the following:

- Neighborhood retail and food establishments, such as a community kitchen; and,
- Mixed-use live/work housing.

CASE STUDY

The Plant (Chicago, IL USA)

The Plant is based in a 93,500 square foot meatpacking facility, converted into a net-zero energy food-business incubator. Its purpose is to demonstrate sustainable food production and economic development by growing and producing food inside a repurposed industrial building. The Plant provides permanent tenant spaces occupied by various food producing businesses and a non-profit education and research center, which includes demonstration farms. In addition, it is planned to operate completely o f -grid, with an anaerobic digester and a combined heat and power system. The digester will consume 27 tons of food waste a day (approx. 11,000 tons annually), including all of the waste produced in the facility and by food-producing businesses all over Chicago.

The methane produced will be burned in a combined heat and power system to produce electricity, plus all the process heat needed for a future on-site craft beer brewery. Excess heat will be used to regulate the building's temperature.[84]

The Plant is funded in part by $1.5 million in grant money from the Illinois Department of Commerce and Economic Opportunity. Current tenants include: a bakery, bread and jam company; a fishery; an urban farm; and a kombucha brewery. Most importantly, The Plant functions as a social enterprise model: there is a non-profit business, Plant Chicago, and for-profit business, Bubbly Dynamics, who work together to operate The Plant, and both are aimed at socially and environmentally responsible goals

Objective(s):

Create sustainable economic development

Strengthen Resiliency

Recommendation 2: Attract existing businesses to anchor and help support a “Creative Commons” area.

Anchor institutions, such as retail outlets, arts and cultural institutions, or hospitals occupy a unique and influential place within a community. Perhaps most importantly, in addition to their role as community partners, these institutions or businesses may remain economically strong in the face of economic decline or employment shifts. In order to bolster the local economy, there must be a sense of shared value and goals. Just as a business needs a successful community to create demand for its product(s), a community needs a successful business or institution to provide jobs and income for local residents. One such anchor business that has been identified to serve as an economic driver and community partner through the Objective(s) of the “Creative Commons” is the Rockaway Brewing Company.

The proposal has the potential to lead to the following:

- Influence the creation of neighborhood retail and food establishments, such as a restaurant connected to the brewery;
- Support local hiring initiatives;
- Contribute to local energy production (anaerobic digester) or organic fertilizer for urban farms through brew process by-products.

Recommended Business

Rockaway Brewery

Long Island City, NY USA

Originally started in Far Rockaway, Rockaway Brewing Company's operations are based in Long Island City, Queens. Owners Ethan Long and Marcus Burnett started as a small operation among friends before growing into a larger commercial endeavor. The Company's beers are carried in numerous restaurants and bars in Brooklyn, Queens, and Manhattan, and are showcased locally on Rockaway.

Known as Nano-brewers, mainstream media has been picking up on the successes of companies like RBC: "these small breweries are benefiting from an increased awareness of small brewing's economic potential. In addition to creating jobs, many craft brewers also stress the importance of using ingredients from local farmers, which can help regional agriculture. Long in the business of wooing wine tourists, more and more states are putting promotional e f ort behind encouraging brewery tourism."[85]

Photo: Ethan Long and Marcus Burnett of Rockaway Brewing Co.
http://www.brewingnyc.com/queens/

Objective(s):

Create sustainable economic development

Strengthen Resiliency

Recommendation 3:
Green jobs training center and light manufacturing business incubator.

For many residents on Rockaway, the emerging, yet stable, green economy holds the promise that growth in green collar job opportunities will provide a way to put residents back to work while simultaneously making communities sustainable, independent, clean and healthy places to live. The Green jobs training center would provide training in such areas as energy auditing, residential energy retrofitting, and basic weatherization for low-income housing.

The proposal also seeks to provide flexible opportunities for industry redevelopment and light manufacturing by providing space for renewable energy manufacturers and suppliers, such as wind and solar producers, or green infrastructure businesses.

With the support of community partnerships, there is potential for successful on-site, highly-skilled job training that provides direct job placement opportunities within the community to help grow the local economy.

Also, the advantageous geographic location provides opportunities for easy transport and warehousing (proximity to JFK airport, rail, and major truck routes) allowing for growth as an export-based economy.

Case Study

Chicago Green Jobs for All Training Initiative Chicago, IL USA

The Initiative's mission is to "facilitate the development of a skilled workforce that is ready to meet employer demands in the emerging green economy and to capture new employment opportunities for Chicagoland workers."

This program is comprised of three tracks:

1 Training 150 energy auditors, analysts, and other building professionals;

2 Training 150 experienced construction workers in managing and executing commercial, industrial, and residential retrofitting projects; and,

3 Training 300 individuals in basic weatherization techniques so they can upgrade low-income housing (in combination with other federally funded weatherization programs).

Since its creation, the Initiative's work has been guided by connecting stakeholders to pursue the expansion of green collar jobs in the region, creating training programs focused on enabling disadvantaged job-seekers to enter into skilled jobs, and identifying quality employment and job training opportunities with career advancement potential. [86]

Recommended Partnerships

Green Jobs - Green New York

9 components: Residential, Small Business, Non-profit, Multi-family, Green workforce, Constituency-Based Outreach, Advisory Council, Evaluation plans, and reports

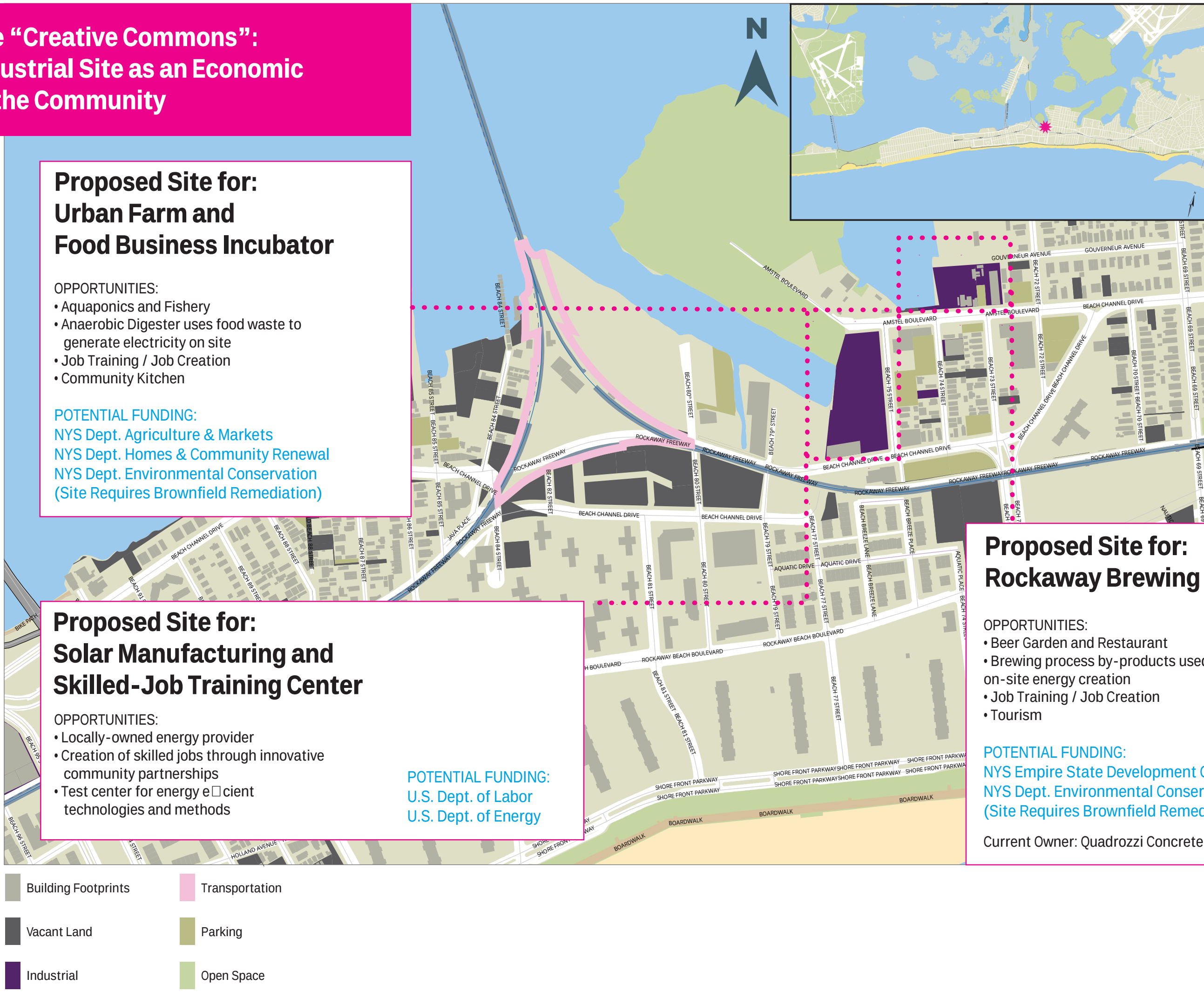
Green Jobs – Green New York, administered by NYSERDA in partnership with community based organizations, is a statewide program that promotes energy e f ciency and the installation of clean technologies to reduce energy costs and reduce greenhouse gas emissions, supporting sustainable community development and the creation of green jobs.

The program provides energy use assessments, installation services, low-cost financing, and green job training. Community based organizations recruit residential building owners, small businesses, non-profit organizations, and multi-family building owners into energy assessment and financing programs, as well as encourage individuals to take advantage of green job training opportunities.

Green Work Force NYC

The Green Jobs Training Program, part of Green Work Force NYC, is a free program that trains workers for careers in building operations/maintenance, waste management, and green cleaning. The program trains individuals with job readiness skills, prepares them specifically for green jobs, and connects them with green-oriented employers. LaGuardia Community College o f ers the Green Jobs Training Program is a program of in collaboration with Queens Botanical Garden. [87]

Making the "Creative Commons": Vacant Industrial Site as an Economic Driver for the Community



Proposed Site for: Urban Farm and Food Business Incubator

OPPORTUNITIES:
- Aquaponics and Fishery
- Anaerobic Digester uses food waste to generate electricity on site
- Job Training / Job Creation
- Community Kitchen

POTENTIAL FUNDING:
NYS Dept. Agriculture & Markets
NYS Dept. Homes & Community Renewal
NYS Dept. Environmental Conservation
(Site Requires Brownfield Remediation)

Proposed Site for: Solar Manufacturing and Skilled-Job Training Center

OPPORTUNITIES:
- Locally-owned energy provider
- Creation of skilled jobs through innovative community partnerships
- Test center for energy efficient technologies and methods

POTENTIAL FUNDING:
U.S. Dept. of Labor
U.S. Dept. of Energy

Proposed Site for: Rockaway Brewing Co.

OPPORTUNITIES:
- Beer Garden and Restaurant
- Brewing process by-products used for on-site energy creation
- Job Training / Job Creation
- Tourism

POTENTIAL FUNDING:
NYS Empire State Development Corp
NYS Dept. Environmental Conservation
(Site Requires Brownfield Remediation)

Current Owner: Quadrozzi Concrete

*Photos reflecting map of adjacent page

http://cultivatinghealthyplaces.com/tag/urban-agriculture/

Objective(s):

Empowering community with information to improve capacity, self-su□ciency, and obtain public services

Recommendation 4:

Create partnerships amongst various stakeholders (public, private, and local community groups) in order to provide interventions and job training for youth.

The neighborhoods of Arverne, Far Rockaway, Bayswater, and Edgemere have one of the largest concentrations of youth population (under the age of 25). These neighborhoods fall into two zip codes: 11691 and 11692. Within these zip codes, over 25 percent of the population have achieved less than the equivalent of a high school diploma.[88] The gang activity witnessed in the area, combined with a lack of youth-oriented programming and interventions, has led young people to simply go to school and then straight home, with no positive activities in between. A student at Scholar's Academy and interning with the Rockaway Waterfront Alliance stated, "My favorite place to be is at home," exemplifying the lack of safe spaces in the area.

We therefore propose a partnership comprising the following entities: NYPD Police Precinct 105, public housing residents, tenant associations, faith based organizations, public school administrators, Queens Community Board 14's Youth Services/ Education Committee, as well as other community based organizations (Such as Rockaway Waterfront Alliance, Rockaway Youth Task Force, Ocean Bay Community Development Corp., etc.). This partnership could collaborate on initiatives, projects, and programming focusing on issues that would pertain to the youth in the community.

Case Study

https://www.facebook.com/pages/Open-Door-Youth-Gang-Alternatives/171590823662

Open Door Youth Gang Alternatives

Denver, CO USA

Open Door Youth Gang Alternatives is a non-profit group in Denver, Colorado started as a response to spillover gang violence from California in the 1990s. Sticking to its mandate of gang prevention, Open Door creates programs for schools, non-profit agencies, and law enforcement groups that range from precincts to the State of Colorado Department of Corrections. Seeking to educate communities on prevention, Open Door provides programming and mentoring. A unique feature of its mentoring mission is that it pairs former gang members with job training opportunities and housing, as well as with at-risk youth to prevent further gang recruitment and activity.[89]

Objective(s):

Create sustainable economic development

Commercial services in the Edgemere area are presently under utilized. We recommend a series of commercial services that would serve local people while creating more job opportunities.

Recommendation 5: Install a bike repair store near the A-train station; use vacant land for a community garden; and design a small-scale local food-production incubator.

To support the creation of a cycling economy in Rockaway, as well as to employ local youth, a bike repair shop in the Ocean Village Complex would be an opportunity for local entrepreneurship. Additionally, local youth could be trained in bicycle repair, both to work in the shop as well as to be able to repair their own bicycles. Additionally, there are large swathes of vacant land adjacent to the Ocean Village complex, both in the Arverne East acreage as well as adjacent to the Ocean Village campus.

Were this land use for urban agriculture, such production could serve as a raw material source for an incubator commercial kitchen in the Ocean Village complex. This incubator could allow local food startups to have access to a commercial kitchen without having to invest in space and equipment.

CASE STUDY

ACENET Athens, Ohio

The Appalachian Center for Economic Networks (ACENET), while providing a range of business incubation services, provides a commercial kitchen on a fee for service basis to clients.[114] This commercial kitchen has allowed a number of local brands to both start production and then move on to their own facilities, in the case of Frog Ranch Salsa (producer of National Championship-winning salsas),[115] or to move from sub-par facilities to ACENET's commercial-grade kitchen, a path taken by Crumbs Bakery.[116]

Objective(s):

Create sustainable economic development

Recommendation 6: Design an outdoor cafe and food truck area using vacant space adjacent to the A-train overpass.

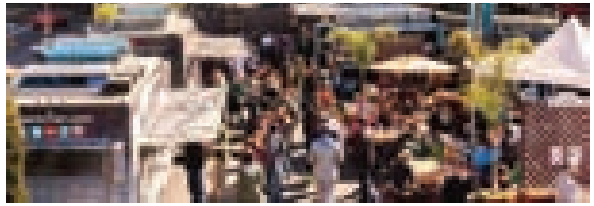
When commuters walk down from the A-Train platform at Beach 60th St, they emerge on a desolate scene. A dirt lot serves as an informal parking lot, making walking uncomfortable and providing no public space for socializing or gathering. An outdoor café and a food truck area would provide a place for residents to congregate and socialize. These commercial activities would be easy to implement and could create a welcoming atmosphere for the residents of Rockaway.

CASE STUDY

SoMa StrEat Food Park

San Francisco, California

The first permanent food truck pod located in San Francisco, California (428 11th Street). SoMa StrEat Food Park is opened 7 days a week for both lunch and dinner. They have up to ten food trucks, and includes covered heated seating, free WiFi, a beer garden, five big screen TVs movie nights and sporting games. This presents itself as a unique setting for the San Francisco community and would work well in the Rockaways that currently has limited food options.



EDUCATION

As detailed in the existing conditions section, public schools in the Rockaways face overcrowding issues. In the face of a challenged school system within the Rockaways, the following recommendations seek to provide alternative strategies in order to foster healthier learning environments for all ages beginning with children and adolescents.

Objective(s):

Strengthen Resiliency

Empowering community with information to improve capacity, self-su□ciency, and obtain public services

Recommendation 1: Redevelopment of the National Grid site to serve as a strategic location for the Jamaica Bay Science & Resiliency Institute, which would include structured parking for the ferry.

* This project assumes a private-public partnership.

The National Grid site, which is located at Beach 108th and Beach Channel drive, totals 8.8 acres of land that is in need of further brownfield remediation. The State Department of Environmental Conservation designated the National Grid as a Superfund site. The New York Rising Community Reconstruction Program classified this area as an opportunity for mixed-use redevelopment. (NOTE: Insert figure from NY Rising Report) Within the report of NY Rising Community Construction plan, Rockaway West Report (March 2014), the committee, "identified a conceptual mixed-use program for the site, including flood-proofed ground-floor retail with residential uses above the floodplain, as well as potential facilities for health care services or other institutions". As seen in Holland, the parking lots could be on the ground floor under the buildings, which are raised to avoid flooding from storm surge. The parking area could be screened by retail to make the area more pedestrian-friendly and provide commercial services for the local community. (See Photo)

Due to the fact that the National Grid site is a fairly large site, it would be beneficial to incorporate the construction of the Jamaica Bay Science and Resiliency Institute, thereby placing the Institute in close proximity to other schools, such as Beach Channel High School and Scholars Academy. This location would be ideal for the Institute in conjunction with our recommendation of developing a ferry landing and terminal at Beach 108. (See Ferry Recommendation in Transportation section)

The Jamaica Bay Science & Resiliency Institute is proposed as a partnership among academic institutions, non-governmental organizations as well as community groups, and seeks to perform the following functions:

The Jamaica Bay Science & Resiliency Institute[91] is proposed as a partnership among academic institutions, non-governmental organizations as well as community groups, and seeks to perform the following functions:

- Understand the temporal nature and robustness of the resilience of Jamaica Bay, New York Harbor, Hudson Raritan Estuary, and Gateway National Recreation Area
- Develop models for studying the fundamental nature of resilient systems
- Establish Best Practices for managing ecosystems to ensure resilience and sustainability
- Provide technical assistance and guidance to the institute's governmental partners, including the National Park Service, New York City Parks, and the New York City Department of Environmental Protection
- Serve as a resource for education
- Take responsibility for the dissemination of knowledge about Jamaica Bay's urban ecosystem

Case Study

The Sydney Institute of Marine Science: SIMS Sydney, Australia

The Director and CEO of The Sydney Institute of Marine Science (SIMS), Professor Peter Steinberg, was part of a panel discussion for the Jamaica Bay: State of the Bay symposium in October 2013, which was held at Kingsborough College. The title of the panel was, "Case Studies of Institutes/ Consortia" which included: Steven Cohen, Executive Director, Earth Institute, Columbia University; Denise Reed, Chief Scientist, The Water Institute of the Gulf; Steward Pickett, Plant Ecologist, Cary Institute of Ecosystem Studies and of course Peter Steinberg, Director, Sydney Institute of Marine Science.[92] SIMS is the superior model for Rockaway because the complex nature of the collaboration to form SIMS. SIMS is a partnership between Macquarie University, the University of NSW, the University of Sydney and the University of Technology, Sydney that was founded in 2005. This partnership also is strengthened by collaboration with several state and federal government departments along with the Australian Museum, the University of Wollongong and the University of Western Sydney. The primary focus of SIMS is to conduct research, educate, and conduct research across the fields of Urbanization, Biodiversity, Climate Change, Ocean Resources, and Marine Management in New South Wales. SIMS' location has also been strategically positioned geographically to be able to significantly advance research in their marine environment. The same could be done with being able to strategically locate the Jamaica Bay Science and Resiliency Institute. SIMS also hosts community events as well as allows community-based organizations to rent space to host events such as conferences and meetings.[93]

Recommendation 2: Foster a stronger partnership between National Parks and Rockaway Public Schools in order to expose students to various National Park programs and research projects, which take place in and around the Jamaica Bay unit of Gateway National Recreation Area.

Gateway National Recreation Area has over 25,000 acres of land, which includes the Sandy Hook, NJ unit, the Staten Island unit, and the Jamaica Bay unit (See map). However, a majority of students from the Rockaways do not engage with the programs as much as they should or could. In addition to programs that are associated with National Parks, there is also a program called, “Parks Climate Challenge”, which is meant to educate, inform and directly engage the youth in service. Other programs that are also available include the Youth Conservation Corps and Youth Intern programs available at Gateway NRA.[94]

CASE STUDY

Los Angeles Conservation Corps

Los Angeles, California USA

The Los Angeles Conservation Corps, founded in 1986 by former U.S. Secretary of Commerce and Trade Ambassador Mickey Kantor, exists to provide at-risk young adults and school-aged youth job skills training, education, and work experience oriented towards conservation and service projects for the community. Since 1986 the organization has become a national leader in youth and workforce development and alternative education for inner-city youth/ young adults. The corps is currently the largest urban conservation corps in the US and employs a full-time staf of over 150 employees who serve over 17,000 youth each year.[95]

Recommendation 3: Create educational programs that are centered on sustainability and resiliency in partnership with local NYC organizations and City agencies.

There are numerous programs that promote sustainability as well as resiliency ranging from retrofitting homes to composting waste. The communities within the Rockaways can learn about these initiatives as well as be trained to do it on their own. An example of such a program is The NYC Compost Project and this program is both funded and managed by New York City's Department of Sanitation (The Bureau of Waste Prevention, Reuse and Recycling).

CASE STUDY

Lower East Side Ecology Center

New York, NY USA

The Lower East Side Ecology Center's mission is working towards "a more sustainable New York City by providing community-based recycling and composting programs, developing local stewardship of green space, and increasing community awareness, involvement and youth development through environmental education programs."[96] They have programs such as the Greenmarket Youth Education Project, which connects thousands of NYC school children with Greenmarkets, farmers, and chefs through interactive learning experiences such as farmer classroom visits and field trips. They also provide environmental education programs, the NYC public school recycling champions program, and more. They also are champions and leaders in o f ering composting and commu-nity-based recycling programs since 1987.[97]

Recommendation 4: Incentivize the creation of career readiness programs that train both youth and young adults, such as energy e f ciency and technology training

While the recommendations in the education section of this report primarily addresses the value created by establishing a partnership with National Parks, there are other programs that could also provide career readiness for the young adults within the community. The case studies that are listed, Solar1 and Grid Alternatives, have incentivized the creation of programs that address energy e f ciency and technology. Since the Rockaways is susceptible to storm surge, these programs simultaneously provide an opportunity for local young adults to be trained for alternative energy solutions as well as provide residents the opportunity to hire locally to install alternative energy projects.

Case Study

Solar1 New York, NY USA [102]

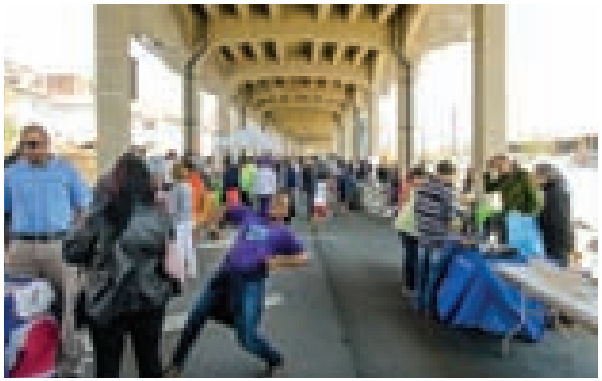
Solar One is a green energy, arts, and education organization founded in 2004 to manage Stuyvesant Cover Park and a small environmental education center. The education center is NYC's first 100% renewable-powered building, fittingly named Solar1. Solar One has since grown to host a wide-array of urban environmental education programs throughout the five boroughs. Solar One provides a green workforce program in connection with over 20 workforce agencies in NYC to provide "hard skill" green job training. Solar One offers ten distinct courses, including solar panel installation, building analyst and energy auditing. Several courses prepare participants for nationally recognized certification exams through agencies like the Building Performance Institute and the US Green Building Council. For all courses, about half of class time is spent in hands-on training in Solar One's Workforce Lab.

The Workforce Lab, located in Long Island City, is outfitted with classrooms, hands-on training areas and state-of-the-art equipment. The hands-on training areas allow participants to practice energy auditing, energy efficiency and solar installation techniques in a real life scenario. The building includes exposed wall cavities for practicing air sealing, replaceable doors and windows, and an attic floor simulator to practice insulation, as well as a simulated roof to practice solar panel installation. The lab also includes the latest green technology, such as low-flow toilets, high efficiency boilers and furnaces, and electrical retrofitting equipment.[103]

CASE STUDY

Grid Alternatives Oakland, CA USA [104]

Grid Alternatives trains and leads volunteers and job seekers to install solar systems on low- income households throughout California. Volunteers and participants in their job training program work under the supervision of construction professionals on the project and are therefore not required to have any prior experience with solar installation. Grid Alternatives has installed over 8.5 megawatts of renewable energy for over 3,000 families since 2004 and has trained more than 11,000 volunteers and job seekers, some of whom have gone on to become certified solar installers.[105]



STORMWATER MANAGEMENT

Stormwater management can be defined as the process of managing or controlling the water in which is considered "runo". According to the United States Geographical Survey website, "runo" is defined in three ways:[98]

1 That part of the precipitation, snowmelt, or irrigation water that appears in uncontrolled surface streams, rivers, drains or sewers. Runo f may be classified according to speed of appearance after rainfall or melting snow as direct runo f or base runo f , and according to source as surface runo f , storm inter f ow, or ground-water runo f .

2 The total discharge described in (1), above, during a specified period of time.

3 Also defined as the depth to which a drainage area would be covered if all of the runo f for a given period of time were uniformly distributed over it.

Runo primarily derives from impervious surfaces such as, parking lots, driveways, sidewalks, and rooftops. The tendency of stormwater is to flow directly from streets and gutters and make its way into our streams and rivers, often with little or no treatment. While DEP has a green infrastructure grant program for private property, the Rockaways are in an eligible area.[99]

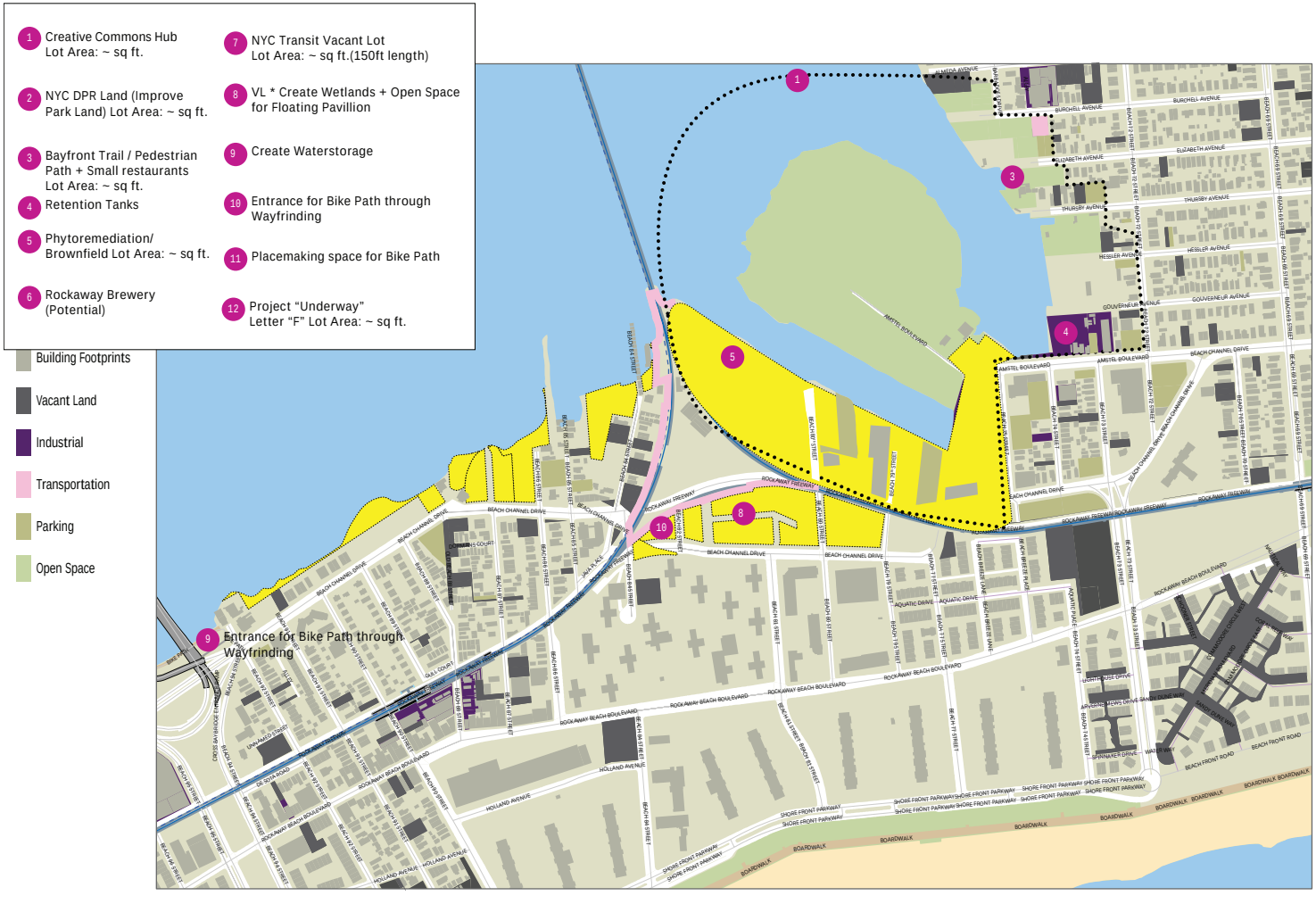
The following recommendations seek to address the Rockaways' elevation and drainage issues.

Objective(s):

Strengthen Resiliency

Recommendation 1 Partner with community groups and city agencies such as NYC DOE, NYC DPR, NYC DOT, Trust for Public Land, NYC DEP, and other elected o f cials to develop programs for the construction and maintenance of green infrastructure.

As mentioned in the existing conditions section of the report, there is already an established conservancy (JBRPC) that can coordinate with the various agencies as well as the community groups to begin to address the issues of stormwater management on a smaller scale than the larger infrastructure projects such as the dune restoration, bulkheads or storm barriers. The JBRPC can raise funds also to be able to create green infrastructure projects that serve multiple functionalities such as the case study mentioned for P.S. 261.

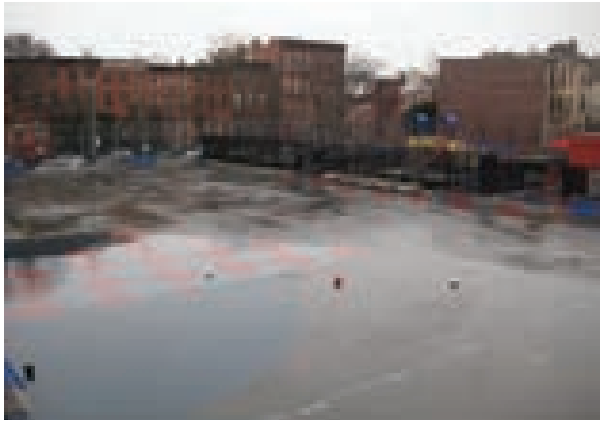

1 Creative Commons Hub
Lot Area: ~ sq ft.
2 NYC DPR Land (Improve Park Land) Lot Area: ~ sq ft.
3 Bayfront Trail / Pedestrian Path + Small restaurants
Lot Area: ~ sq ft.
4 Retention Tanks
5 Phytoremediation/ Brownfield Lot Area: ~ sq ft.
6 Rockaway Brewery (Potential)
7 NYC Transit Vacant Lot
Lot Area: ~ sq ft.(150ft length)
8 VL * Create Wetlands + Open Space for Floating Pavillion
9 Create Waterstorage
10 Entrance for Bike Path through Wayfrinding
11 Placemaking space for Bike Path
12 Project "Underway"
Letter "F" Lot Area: ~ sq ft.
Building Footprints
Vacant Land
Industrial
Transportation
Parking
Open Space
9 Entrance for Bike Path through Wayfrinding

Case Study

P.S. 261 Brooklyn, NY USA[100]

Used also as a case study also for NYC DEP's Green Infrastructure annual report for 2013, a rain garden, permeable pavers, shade trees and synthetic turf field were installed in the playground at P.S. 261. The school playground had an impervious area of 23,000 square feet, which now manages more than 500,000 gallons of stormwater annually. The construction costs for the total project was $604,000. Out of the $604,000, roughly 44% went into green infrastructure costs.[101] The Trust for Public Land also was also active in raising funds from private stakeholders.

This was the result of a partnership that was made between the City of New York and the Trust for Public Land to build up to 40 new school playgrounds, which will include green infrastructure to capture stormwater when it rains. The construction of the green infrastructure in P.S. 261's playground seeks to alleviate the pressure on the city's sewer system at the Gowanus Canal. New York City Council member Stephen Levin as well as the School Construction Authority also contributed funds to the project. The result shows how the community can benefit by partnering with city agencies and the like to develop programs for the construction and maintenance of green infrastructure.



PROPOSALS | RAMP: The Rockaways Studio "Waves of Change"

Objective(s):

Strengthen Resiliency

Recommendation 2: Explore the opportunity of vacant lots south of Beach Channel Drive between Beach 84th and Beach 75th for active recreation with green infrastructure

The land that is south of Beach Channel Drive between Beach 84th and Beach 75th is owned primarily by the City's Department of Housing Preservation and Development. Most of the land is overgrown with grass or has standing water; these areas represent an opportunity to create of active recreational facilities with dual functionality. The case studies listed show how to transform parking lots into areas that not only address stormwater management, but also become a gathering place for local people. As mentioned in the transportation section, we also propose an ADA accessible train station be installed by the MTA at this location.

Case Study

Queens Plaza's Dutch Kills Green Park Long Island City, NY USA

The Landscape Architecture Foundation Team had led and coordinated all phases of the design of Dutch Kills Green and was charged by NYC Economic Development Corp.[106] and NYC Department of City Planning with improving the environmental quality by reconfiguring tra f c circulation of pedestrians and cyclists. The largest challenge that they claimed to face was coordination of multiple stakeholder agencies and departments that represented a range of jurisdictions and services, including utilities, transportation, transit, bridge, parks, water, sewer, electric, gas, and telephone.[107] Dutch Kills Green was the largest new edition to Queens Plaza, which resides in what was a former parking lot.[108]

The newly sustainable designed 1.5-acre park, Dutch Kills Green, manages stormwater while simultaneously providing residents and commuters with a safe path to ride their bike or simply walk. The cost of this project was $45 million and it also replaced the parking lot with wetlands, a small amphitheater, a collection of artistic benches, and two Dutch millstones from the 1600s.[109] One of the benefits of this pseudo wetland park is the fact that it prevents over 20.2 gallons of stormwater from entering into the city's CSO system annually, which also avoids other capital costs in order to upgrade the stormwater infrastructure. The remainder of the landscape performance benefits can be also viewed in the appendix.

Case Study

Manassas Park Elementary School + Pre-k

Manassas Park, Virginia USA [110]

The beauty behind Manassas Park Elementary School + Pre-k was the redesign of its outdoor space. Similar to the Dutch Kills Green Park, the site was built on an existing impervious parking lot. The Bioswale Amphitheatre serves as an outdoor classroom and functions as a stormwater filter. This form of infrastructure has dual functionality and supports activities from the Performing Arts to Science classes. The ideas behind creating these spaces are also for schools to shepherd children to become environmental stewards of their own communities.

No one can argue the fact that great stewardship is developed from the experiences children learn from educators. The takeaway from Manassas Park Elementary is not only its inherit multi-purpose nature, but the moments in which teachers will teach students for the very first time in their lives about the environment and/or other life-changing memorable moments which takes place within that infrastructure.
Architect: VMDO Architects, P.C.

1 MANASSAS PARK ELEMENTARY SCHOOL (MPES) - 2009
2 COUGAR PRE - K - 2009
3 COUGAR ELEMENTARY SCHOOL - 2001
4 RELOCATED PARKING LOT
5 CAMP CARONDELET
6 MPES GEOTHERMAL WELL FIELD
7 PRE - K GEOTHERMAL WELL FIELD
8 RAINWATER CISTERN

PLACEMAKING

Between the A-train's 60th Street station, and the community development opportunities at the firehouse located at Beach 59th Street, the intersection of Beach 59th Street and Rockaway Beach Boulevard is one of the most important intersections in the Arverne neighborhood of Rockaway. This empty space desperately needs more activity. The elevated space under the A-train overpass is empty and under utilized. We propose design interventions aimed at creating more activity in this space and its environs. Specifically, we propose transforming the present open space from its current use as informal (and probably unpermitted) parking, to active uses programmed by RWA and operated out of the firehouse community center. These can include summer activities for youth such as the Earth Day celebration, as well as a farmers market.

Objective(s):

Strengthen Resiliency

Recommendation 1: Adaptive reuse of Firehouse 59

We support the design of a gathering place full of active programming for Firehouse 59. We suggest opening a cafe on the 1,500-2,000 square foot first floor of this building. In addition, we suggest using the second floor as a yoga studio. Commercial activities in these spaces could help cross-subsidize the community development work of RWA.

We feel that tenants appropriate for these spaces include local co□ee brands that are familiar to many New Yorkers and a□ordable to the Rockaway community. This represents an opportunity for local entrepreneurship, as we do not recommend its leasing to a major national co□ee chain. Use of the second floor as a yoga studio would be appropriate during hours that it is not being used for its community facility purpose.

A third recommendation we have for this space is the use of the building's façade. Constructed of brick, these exterior walls could be re-purposed as a rock climbing facility. All of these uses would contribute to youth training e□orts for the local community. Increased activity around this firehouse would jump-start future economic activity in the Ocean Village complex, immediately next door.

Case Studies

Cafe Grumpy New York, NY USA [111]

Cafe Grumpy is an independently owned and operated cafe, bakery, and roastery with four locations in New York City. Familiar to New Yorkers, it is a charming, a fordable and delicate local cafe chain brand, turning caf eine consumption to connoisseurship. A Café Grumpy location or an equivalent, locally owned café could contribute to a place-making e fort while providing local employment.

Pure Yoga New York, NY USA [112]

Pure Yoga is a membership-based Yoga studio in New York City. Given the potential for tourism in Rockaway, an equivalent, locally owned yoga studio could provide employment opportunities for locals while catering to established seasonal demand.

Objective(s):

Create Sustainable Economic Development

Recommendation 2: Design a skateboard park and playground under the A-train overpass.

We recommend the installation of a skateboard park and playground under the A-train overpass. These spaces would be constructed with local materials and labor and would utilize the existing pillars and infrastructure of the overpass to create a friendly and open space for Rockaway youth.

Case Study

Burnside skateboard Park

Portland, Oregon USA

Initially constructed without authorization of the City of Portland by skateboarders, Burnside is the preeminent example of a “below overpass” skateboard park. Burnside’s unique growth and evolution, through the sweat equity of a handful of dedicated individuals, have allowed the park to mature into one of the best skateboard parks in the world.[113]

Objective(s):

Empowering community with information to improve capacity, self-su□ciency, and obtain public services

Create unity within the Rockaway Peninsula

Recommendation 3: Transform hot spot locations (i.e.: Crossbay Bridge Promenade; Firehouse 59; Jamaica Bay Wildlife Refuge; Bayswater Park; Proposed H Train stop at Beach Channel/Beach 81st; Proposed Beach 108th Street Ferry landing) into both emergency and information hubs as well as incorporate additional smaller kiosks through out Queens Community District 14 to facilitate an increased access of information on neighborhood social services and community resources and disaster preparedness.

As discussed in our existing conditions research, the Rockaways are located in a flood zone. We recommend researching the best spots that are visible to cyclists, pedestrians, and moving cars for the location of information/emergency kiosks and or hubs. The kiosks would be use 100 percent renewable energy with the use of wind energy and solar panels. Aside from local events that are happening and wayfinding components of the information hub, the kiosks would also include the following: rescue kits, first aid kits, and compressed, dehydrated food to be used in emergencies.

Case Study

NYCgo's O cial NYC Information Centers New York, NY[117]

NYC & Company (NYCgo) is New York City's o f cial marketing, tourism and partnership organization. NYCgo has five locations, such as City Hall or in Chinatown, that already serve as information hubs and/or kiosks. (See Appendix) NYCgo's Information Kiosks mostly appeal to the needs for tourists and visitors, and Chinatown location has a bilingual sta f (Mandarin and Cantonese speaking).[118] Tracey Turner Design designed the Chinatown information center[119] and the Midtown and Time Square location Information Centers was designed by WXY Architecture & Urban Design.[120]

Objective(s):

Create Sustainable Economic Development

Recommendation 4: Design and curate an exhibition that commemorates Hurricane Sandy, as well as previous storms to both inform and educate the public of the past, present and future of the Rockaways

Hurricane Sandy made a much larger impact in the Rockaway than elsewhere in the five boroughs, and it is vital that this event stay in the community's collective memory so that there will be political will for increased resiliency in the area. We therefore propose a commemorative exhibition on Sandy and other large storm events to educate visitors and to also inform future residents and youth of the impact of storms and the importance of resiliency in planning and development.

Case Study

Watersnoodmuseum[121]

Ouwerkerk, Netherlands

The Watersnoodmuseum also known as the, "Flood Museum", is located in the sea front to the south of the village Ouwerkerk. The Flood Museum is located in the four caissons used for closing the last dijkgat, which were created during the foods of 1953, the food of '53 was equivalent, if not worst, to the damage of Hurricane Sandy. The museum has been notorious to be kept open by the help of volunteers.

Objective(s):

- Create unity within the Rockaway Peninsula
- Improve connectivity
- Strengthen Resiliency

Recommendation 5: Design and implement night-lights throughout the study area, as well as wayfinding and signage.

We propose the design and implementation of night-lights at the 60th Street station. These lights would improve safety and enhance a feeling of security in the area. Similarly, we propose the design and implementation of LED and solar night-lights along important routes such along 59th Street southward to the beach, in the Ocean Village campus, and under the elevated tracks of the A-train. Additionally, we propose the design and implementation of uniform wayfinding and signage in the Arverne and Edgemere areas using similar patterns but di□erent styles. Unique signage can become a community icon for local residents, and can help visitors find their way, an important aspect for a growing tourist economy.

Case Study

Golden Gate National Park Conservancy, National Park Service

San Francisco, San Mateo & Marin counties, CA [122]

Golden Gate National Recreation Area (Golden Gate NRA)[123] located in San Francisco, CA can be seen as one of the most successful, well integrated, and designed interpretive signage systems that blends well within the regional area as permanent fixtures which informs visitors and residents of the Bay Area's history. (See photos) The entire Golden Gate NRA is filled with interpretive signage that promotes walking as well as explains the history of the area.[124] Events are made around these interpretive signage areas to include walking, historical tours, and education about the environment. Along with Golden Gate Bridge Park, signs on Alcatraz Island (also part of that Golden Gate National Recreation Area) are consistent with the design across the region.

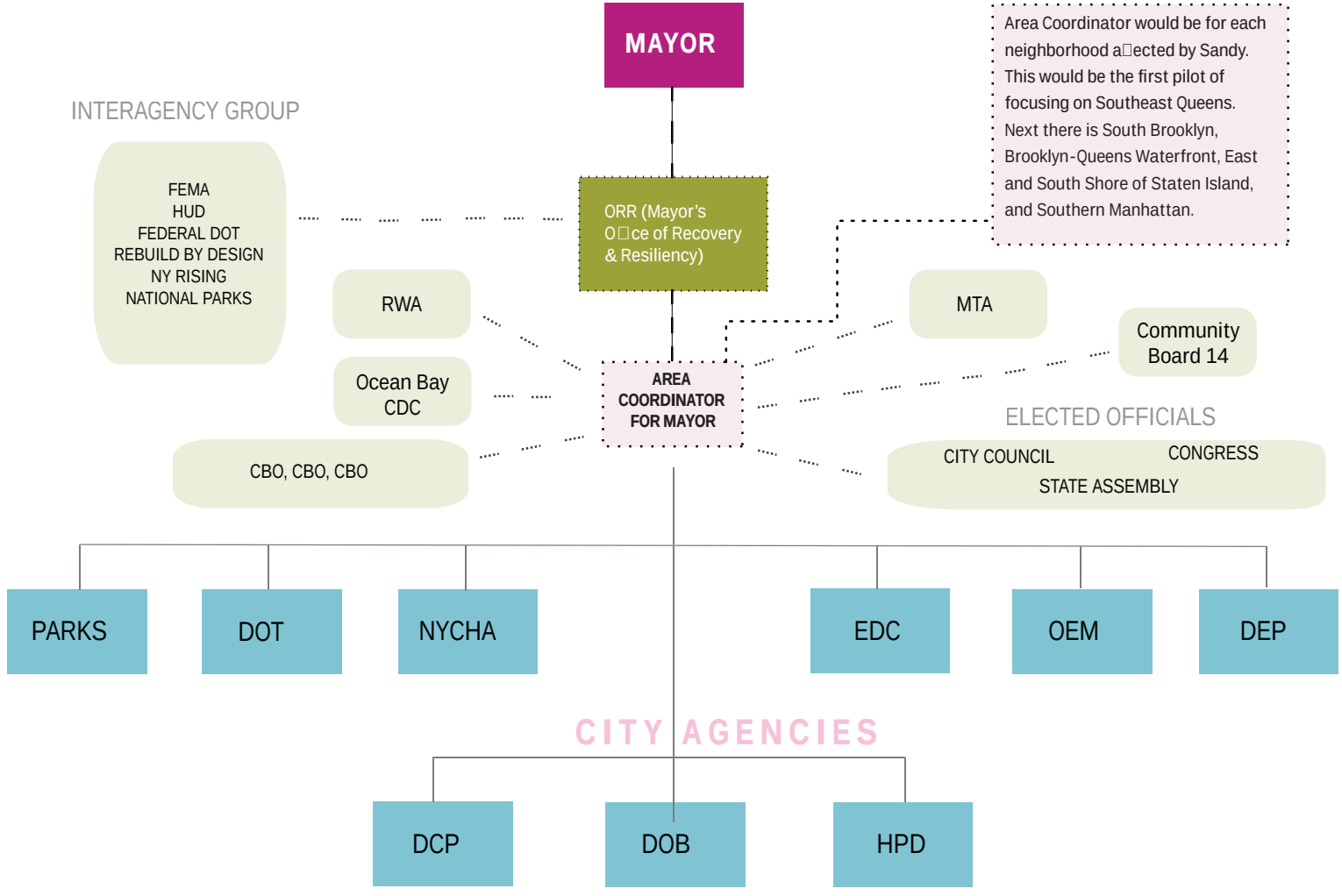
The Golden Gate National Park Conservancy (GGNPC) also includes several youth programs [125]: community group programs, leadership programs, and summer camps. In addition the GGNPC provides a considerable amount of funding and is a community-supported non-profit organization.[126] The foundation of this conservancy, which was originally called the "Golden Gate National Parks Association," has slowly built capacity since 1981.

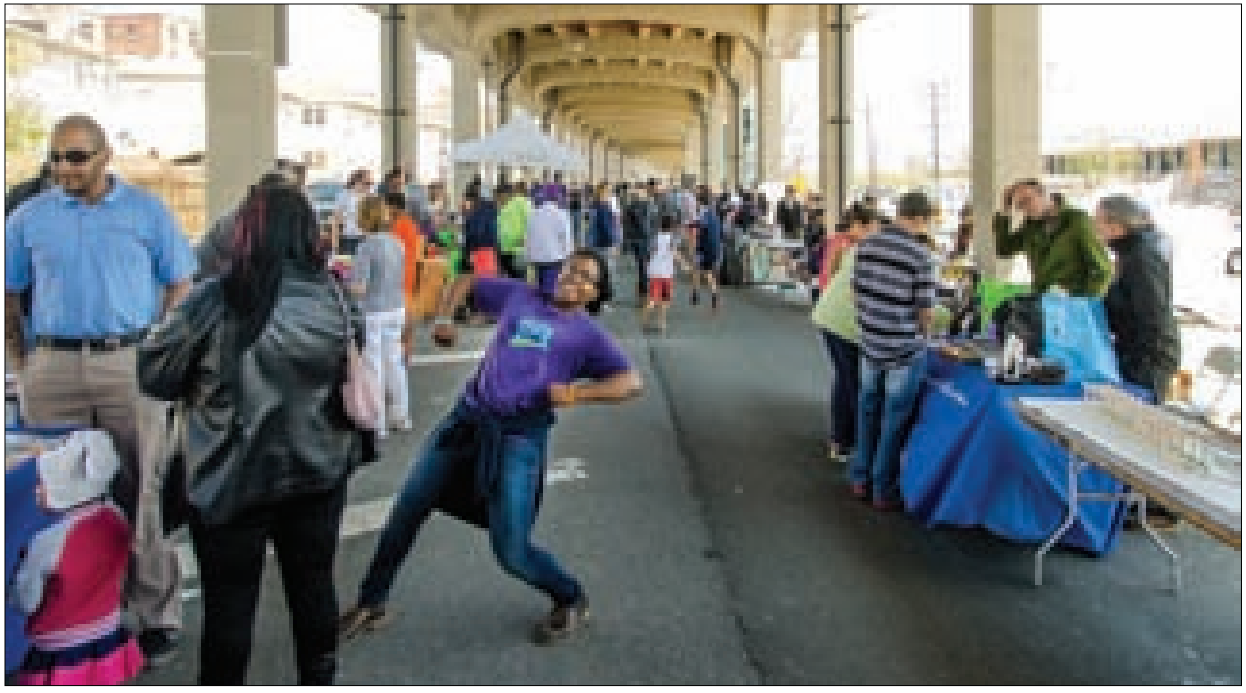
GOVERNANCE

Based on the structure that was outlined in the SIRR report orchestrated by the o f ces of NYC EDC and NYC OLTPS, there are five clustered areas that focus around communities that were impacted by Superstorm Sandy. Those five clustered geographical boundaries are the Brooklyn-Queens Waterfront, the East and South Shores of Staten Island, South Queens, Southern Brooklyn, and Southern Manhattan. We recommend that the City of New York appoint a type of czar that would coordinate implementation and recovery e orts for South Queens for all issues related to housing, transportation, parks, economic development, and utilities.

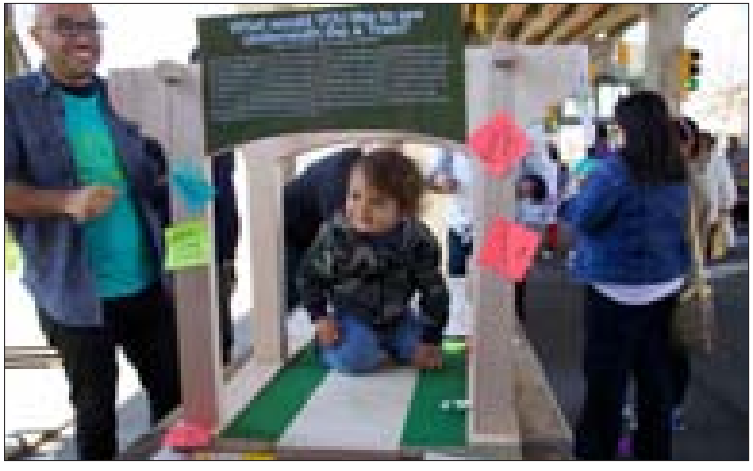
The czar would lead a task force that would have the authority to direct city agencies to take action to improve the resilience of the study area. This task force would be a test case for a model that could be replicated for the other four geographic areas that were damaged by Superstorm Sandy. See figure for an organizational diagram of how the task force would relate to city, state, and federal agencies.

IMPLEMENTATION TASK FORCE





RWA Flickr © EARTH DAY 2014



EARTH DAY 2014; The Underway model large scale used for sharing ideas of what the community would like to see under the elevated A train.

DUTCH KILLS GREEN LANDSCAPE PERFORMANCE BENEFITS

• Prevents over 20.2 million gallons of stormwater from entering the city's combined sewer system annually, avoiding a projected $3.4 million in future capital costs to upgrade stormwater infrastructure, such as constructing a larger combined sewer overflow tunnel.

• Provides an estimated $20,000-$37,000 in net annual benefits to the City. This includes reduced energy consumption, improvements to air quality, carbon storage, and increases in surrounding property value.

• Reduces irrigation needs by 786,500 gallons per year through a native and adapted plant palette, saving $3,500 in annual irrigation costs when compared to a standard lawn.

• Stores 4,698 lbs of carbon and sequesters 1,079 lbs of carbon per year in 174 new trees on-site and adjacent to the site.

• Increases property value of surrounding properties. Between 2006 and 2013 -- a period when the real estate value in the six largest U.S. Metro markets (including NYC metro) grew by only 8% -- the estimated market value of properties surrounding Dutch Kills Green increased 37%.

• Increased bicycle tra f c by 12% since the project was completed in 2011 with an average of 3,416 cyclists using the bicycle path per day. On average 7% of these users stop to use either the green or median seating areas.

• Helped reduce pedestrian and cyclist fatalities. Thanks to safety improvements like new pedestrian countdown signals, 2011 marked the first year that no deaths were recorded along Queens Boulevard, infamously known for many years as the "Boulevard of Death." This is down from a high of 18 pedestrian deaths in 1997.

• Reduces average ambient noise within the green by 23%. By removing two lanes of tra f c that formerly

bisected the space and adding lush vegetation, noise from tra f c and the elevated rail lines decreased from a typical range of 85-101dB to 69-75dB.

• Attracts an average of 125 people per day in summer. Of these visitors, 92% engaged in recreational activities, 57% of which were also social activities.

Project Team Client: New York Economic Development Corporation, New York City Department of City Planning **Prime Consultant / Landscape Architect**: WRT/ Margie Ruddick Landscape (MRL**)**

Civil Engineering: Langan Engineers **Urban Design and Architecture**: Marpillero Pollak Architects

Public Artist: Michael Singer Inc. **Lighting Design**: Leni Schwendinger Light Projects

Tra□c Engineer: Taub *&* Associates

Construction Oversight: LiRo Engineers, Inc., Site Works Landscape Architecture, Matthews Nielsen Landscape Architecture

General Contractor: Triumph Construction Company, MC Landscaping

SITE RECORD OF ROCKAWAY MGP (NYS DEC)

Administrative Information

Site Name: K - Rockaway Park MGP
Site Code: 241029
Program: State Superfund Program
Classification: 02

Location
DEC Region: 2
Address: Beach Channel Drive *&* Beach 108th Street
City: Rockaway Park
Zip: 11694
County: QUEENS
Latitude: 40.582701470

Longitude: -73.831207150
Site Type: STRUCTURE
Estimated Size: 8.800 Acres

Site Owner(s) and Operator(s)

Current Owner Name: National Grid

Current Owner(s) Address:
Environmental Assessment Management
Hicksville, NY, 11801

Owner(s) during disposal: LONG ISLAND LIGHTING COMPANY (LILCO)

Current On-Site Operator: Long Island Lighting Company (LILCO)

Stated Operator(s) Address:
445 Broadhollow Road
Melville, NY 11747

Hazardous Waste Disposal Period

From: 1894 To: 1959

Site Description

Location: The Rockaway Park MGP site is a 9-acre parcel located in the Rockaway Park Section of the Borough of Queens, New York City, which is an urban area. The site is bounded by Beach Channel Drive to the north; Beach 108th Street to the east, and Rockaway Freeway to the west and south. Jamaica Bay is located 200 feet north of the site, and the Atlantic Ocean is one-quarter mile to the south. Site Features: The site is currently vacant with no buildings. Roughly one quarter of the site is paved, the rest of the site is unpaved. Current Zoning/Use: The site is zoned commercial and is currently not in use. The surrounding parcels are commercial and industrial. The nearest residential property is 200 yards to the south on the far side of an elevated subway line. Past Use of the Site: The parcel was the site of a large manufactured gas plant (MGP) from the late 1800's through the 1950's. That historic use led to coal tar contamination escaping from the gas holders, tar separator, and various independent disposal areas in the north and west portions of the site, including the bulkhead area north of Beach Channel Drive. After closure of the MGP, the site was used by

the utility as a service center, which included a gas regulator station, electric substation, and storage areas. A Record of Decision was issued for the site in October 2004. The remedy includes a large-volume soil removal and two subsurface barrier walls to prevent further o site migration of coal tar. Remedial construction began on the site in October of 2008 and is ongoing. Site Geology and Hydrogeology: The site is underlain by relatively uniform sand. Filling in portions of Jamaica Bay created the northern half to 2/3rds of the site. The water table at the site is roughly 8 feet below grade. Overall groundwater flow is to the north; however the northern half of the site experiences tidal reversals.

Summary of Project Completion Dates

Top of Form

Projects associated with this site are listed in the Project Completion Dates table and are grouped by Operable Unit (OU). A site can be divided into a number of operable units depending on the complexity of the site and the number of issues associated with a site. Sites are often divided into operable units based on the media to be addressed (such as groundwater or contaminated soil), geographic area, or other factors.

Bottom of Form

Contaminants of Concern (Including Materials Disposed)

TYPE OF WASTE	QUANTITY OF WASTE
BENZENE (D018 WASTE)	UNKNOWN
COAL TAR	UNKNOWN

Site Environmental Assessment

Nature and Extent of Contamination: The primary contaminants of concern known at this time are benzene, toluene, ethylbenzene, xylene (BTEX) and polycyclic aromatic hydrocarbons (PAHs). Investigations indicate a plume of dense non-aqueous phase liquid (DNAPL) proceeds vertically underneath the site roughly 110 feet and to the north of the site. This layer of DNAPL has created a groundwater plume that extends to the north and east just beyond the site and contamination in the soils under the site. Exceedances of standards, criteria,

and guidance include BTEX and PAHs in groundwater and subsurface soil. Special Resources Threatened: Jamaica Bay is just to the north of the site. It is not currently impacted by the site, but may be in the future if MGP tar is allowed to freely migrate into the bay. Significant Threat: The site represents a significant environmental threat because of ongoing releases from source areas of contaminants into the groundwater and its potential to release contaminants into Jamaica Bay.

Site Health Assessment

Since the site is fenced and covered by two feet of clean sand and gravel, people will not come into contact with site related soil and groundwater contamination unless they dig below the surface. Contaminated groundwater at the site is not used for drinking or other purposes and the site is served by a public water supply that obtains water from a di□erent source not a□ected by this contamination. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and a□ect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Because the site is vacant, the inhalation of site related contaminants due to soil vapor intrusion do not represent a current concern. Furthermore, environmental sampling indicates soil vapor intrusion is not a concern for o□-site buildings.

http://rockawayparkmgpsite.com/site_descr_rock.html

The Site also includes a bulkhead of approximately 0.6 acres, immediately north of Beach Channel Drive, owned by the City of New York.

The majority of the site is undeveloped. A one-acre parcel in the northwest corner of the property is no longer considered part of the site. That portion was eliminated from the site description in 2000 as part of a redefinition of the site boundaries based upon available data. A new electric substation was built at this location to allow an existing 80 year-old substation located on the northeast corner of the site to be abandoned and subsequently demolished. That former substation parcel is a part of the site.

Gas production began at the site in the 1880's

and continued until the mid-1950's. During its life, the plant expanded several times to increase its production and storage capacities. Most of these expansions were onto adjacent properties created with fill dredged from Jamaica Bay. During the life of the plant, three companies owned it. The final owner of the MGP, while it was still producing gas, was the Long Island Lighting Company (LILCO). The property remained LILCO's until it merged with Brooklyn Union Gas Company in 1998 to form KeySpan. National Grid then acquired KeySpan in 2008.

In 1998, the site was added to the State's Registry of Inactive Hazardous Waste Disposal Sites (Registry), as a class 2 site. A class 2 site "poses a significant threat to the public health or environment and requires remedial action." As a result of this classification, KeySpan entered into an Order on Consent with the NYSDEC, in 1999, to perform a remedial investigation/ feasibility study and remediation of the site.

The Remedial Investigation was conducted between 1999 and 2002, followed by Supplemental Investigations. The Key Findings of the Final Remedial Investigation Report were:

Contaminants detected in soil and groundwater are consistent with those expected for a former MGP site (primarily the BTEX complex – Benzene, Toluene, Ethylbenzene and Xylene as well as PAH's – polycyclic aromatic hydrocarbons, and cyanide compounds);

The contaminants associated with the site were observed to be migrating o□-site in a northerly direction, under an adjacent public roadway and the bulkhead owned by the City of New York. The contaminants on the site in some locations have been found at depths 100 feet or more below the surface; and,

There are no data to suggest that the public is being exposed to the chemicals present in surface soil either on the site or in the community, although the potential for exposure – in both current and potential uses – exists absent remedial measures. There are also no data to suggest that the contaminants are having an adverse impact on fish or the transient wildlife in the community.

Based on the results of the investigation and after an analysis of remediation alternatives, the NYSDEC, after a Public Meeting and taking of public comments, approved, in a Record of Decision announced in

2006, a Remedial Action Plan for the site. The key elements of the Remedial Action Plan are:

- Excavation of visible MGP tar to eight feet below ground surface (bgs);
- Installation of on-site and o f -site non-aqueous phase liquid (NAPL) migration barriers set at various depths;
- Installation of passive dense non-aqueous phase liquid (DNAPL) recovery systems;
- Installation of soil gas vapor control methods under any existing or new structures constructed on the site;
- Covering all vegetated areas with clean soil and all non-vegetated areas with either concrete or a paving system;
- Development of a site management plan to address residual contamination and any use restrictions;
- Imposition of an environmental easement; and,
- Annual certification of the institutional and engineering controls.

National Grid completed a Remedial Design in 2008 that was approved by NYSDEC and the New York State Department of Health (NYSDOH), which described in detail how the Remedial Action Plan will be implemented, including management of potential impacts to the community during the excavation and construction phases. A copy of the Remedial Design may be found in the Reports section of Key Documents.

Project Description

Following are the steps most often required by the New York State Department of Environmental Conservation (NYSDEC) in the investigation and remediation of a former MGP site.

- Remedial Investigation/Feasibility Study
- Interim Remedial Measures
- Record of Decision
- Design and Construction

The Rockaway Park Site project is now in the Design and Construction Phase. The Design phase was completed in 2008 and the Construction Phase for the on-site area commenced in December 2008 and is scheduled for completion in late 2012.

Remedial investigation Summary:

1. Contaminants detected in soil and groundwater are consistent with those expected for a former MGP site (primarily the BTEX complex – Benzene, Toluene, Ethylbenzene and Xylene; PAH's – polycyclic aromatic hydrocarbons; and cyanide compounds.

2. The contaminants associated with the site were observed to be migrating o f-site in a northerly direction, under an adjacent public roadway and the bulkhead owned by the City of New York. The contaminants on the site in some locations have been found at depths 100 feet or more below the surface.

3. There are no data to suggest that the public is being exposed to the chemicals present in surface soil either on the site or in the community, although the potential for exposure – in both current and potential uses – exists absent remedial measures. There are also no data to suggest that the contaminants are having an adverse impact on fish or the transient wildlife in the community.

Interim Remedial Measures:

- Prior to its acquisition by National Grid, KeySpan undertook Interim Remedial Measures (IRM) to minimize any current impact of the environmental conditions related to the historic use of the site.

- Early in the project, KeySpan undertook a "cut-and-plug," capping underground pipes that could act as conduits for the migration of contaminated groundwater or source material.

- During the relocation of the Long Island Power Authority (LIPA) electric substation on the site, some contaminated soils were removed.

- An Interim Remedial Measure (IRM) has been conducted on the bulkhead area portion of the site, which is north of Beach Channel Drive and owned by the City of New York. This included removal of surface debris and tar-like materials

on the surface. Supplemental IRM activities also included additional removal of some subsurface contamination. Separately, in 2003, the City of New York repaired sections of the Bulkhead to address the "wear and tear" of years of constant exposure to the waves and winds of Jamaica Bay.

- In addition to the IRMs, National Grid has completed the demolition of unused structures on the property, and the relocation of utilities in the areas where excavation or construction will take place.

Record of Decision:

The Record of Decision describes the remedial goals and specific remedial requirements for the site to achieve those goals. For the Rockaway Park site the goals are to eliminate or reduce to the extent practicable the following:

- Exposures of persons at or around the site to PAHs, BTEX and cyanide in soil, groundwater and soil gas vapors;
- Environmental exposures of flora or fauna to PAHs, BTEX and cyanide in soil, groundwater, soil gas vapors and sediment;
- The release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards; and,
- The release of contaminants from surface soil, subsurface soil, soil gas vapors, groundwater, and sediment into surface water, indoor air, ambient air, sediment, and soil gas vapors through storm water erosion, vaporization, wind borne dust and groundwater discharge.
- Further, the remediation goals for the site include attaining to the extent practicable:
- Ambient groundwater quality standards;
- Recommended soils cleanup values for surface soils.
- The remedial requirements for the Rockaway Park site are:
- Excavation of visible MGP tar to eight feet below ground surface (bgs);

- Installation of on-site and off-site non-aqueous phase liquid (NAPL) migration barriers set at various depths;
- Installation of passive dense non-aqueous phase liquid (DNAPL) recovery systems;
- Installation of soil gas vapor control methods under any existing or new structures constructed on the site;
- Installation of the Site-Wide Cap consisting of a demarcation fabric, clean soil, and crushed stone;
- Development of a site management plan to address residual contamination and any use restrictions;
- Imposition of an environmental easement; and,
- Annual certification of the institutional and engineering controls.

Shallow Excavation activities commenced in December 2008 and were successfully completed in October 2010. In addition, approximately 80-percent of the Site-Wide Cap had been installed as of October 2010, with the balance to be completed after the 120 foot deep barrier wall is installed. In 2011, National Grid commenced the third phase in the installation of the on-site 120-foot-deep DNAPL Migration Barrier along the northern part of the site. The third phase is scheduled for completion in late spring 2012 and site restoration activities and then completion of the Site-Wide Cap is scheduled for completion in the summer of 2012.

Health and Safety

Health and safety is a critical part of the Rockaway Park project as we work to address the environmental impacts at the site and improve the environment. National Grid is committed to protecting the public, our workers and contractors and the environment from potential hazards that can occur as part of cleanup activities planned for the site.

Health and safety programs are comprised of careful planning, good communication and effective monitoring of the execution of the health and safety plans. Remediation work will be performed by qualified contractors that are appropriately trained and monitored, and is to be performed in accordance with applicable

regulations. Health and Safety Plans have been developed for each remediation activity. Contractors are required to provide documentation of employee training and medical monitoring, and are evaluated based on their compliance with established health and safety plans.

Establishing a Community Air Monitoring Program and a Tra f c Control Program will protect public safety. The Community Air Monitoring Program will include air monitoring at the construction / remediation site and also between remediation activities and public residential or commercial areas downwind. Remediation of MGP wastes often results in strong odors that are sometimes unpleasant. Odors will be controlled to the extent practicable by conducting the excavation work under an enclosure with a vapor management system, limiting the size of the area excavated; using foam to cover exposed waste materials and by occasionally stopping work until wind and weather conditions improve.

The Community Air Monitoring Plan has specified monitoring locations and concentrations that will determine when additional odor or emission controls must be used and when the work must stop to protect workers and the public.

The Tra f c Control Program will manage tra f c in and around the remediation activity and whenever trucks travel to and from the site. This program will include route planning for trucks and other vehicles, and coordination with local authorities and agencies on transportation safety issues.

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