

Red Hook

NY Rising Community Reconstruction Plan

MARCH 2014

NY Rising
Community Reconstruction Program



Members of the Red Hook NYRCR Planning Committee

Ian Marvy (Co-Chair)
Gita Nandan (Co-Chair)
Adam Armstrong
Elizabeth Demetriou
Victoria Hagman
Dannelle Johnson
John McGettrick
Florence Neal
Julia Rhodes-Davis
Carolina Salguero
Jim Tampakis

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- W Architecture & Landscape Architecture, LLC

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Back Cover Photo: Bonnie Ellman

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Foreword

Introduction

In the span of approximately one year, beginning in August 2011, the State of New York experienced three extreme weather events. Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy wreaked havoc on the lives of New Yorkers and their communities. These tragic disasters signaled that New Yorkers are living in a new reality defined by rising sea levels and extreme weather events that will occur with increased frequency and power. They also signaled that we need to rebuild our communities in a way that will mitigate against future risks and build increased resilience.

To meet these pressing needs, Governor Andrew M. Cuomo led the charge to develop an innovative, community-driven planning program on a scale unprecedented and with resources unparalleled. The NY Rising Community Reconstruction (NYRCR) Program empowers the State's most impacted communities with the technical expertise needed to develop thorough and implementable reconstruction plans to build physically, socially, and economically resilient and sustainable communities.

Program overview

The NYRCR Program, announced by Governor Cuomo in April of 2013, is a more than \$650 million planning and implementation process established to provide rebuilding and resiliency assistance to communities severely damaged by Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy. Drawing on lessons learned from past recovery efforts, the NYRCR Program is a unique combination of bottom-up community participation and State-provided technical expertise. This powerful combination recognizes not only that community members are best positioned to assess the needs and opportunities of the places where they live and work, but also that decisions are best made when they are grounded in rigorous analysis and informed by the latest innovative solutions.

One hundred and two storm-affected localities across the State were originally designated to participate in the NYRCR Program. The State has allocated each locality between \$3 million and \$25 million to implement eligible projects identified in the NYRCR Plan. The funding for these projects is provided through the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery¹.

Forty-five NYRCR Communities, each comprising one or more of the 102 localities, were created and led by a NYRCR Planning Committee composed of local residents, business owners, and civic leaders. Members of the Planning Committees were identified in consultation with established local leaders, community organizations, and in some cases municipalities. The NYRCR Program sets a new standard for community participation in recovery and resiliency planning, with community members leading the planning process. Across the State, more than 500 New Yorkers represent their communities by serving on Planning Committees. More than 400 Planning Committee Meetings have been held, during which Planning Committee members worked with the State's NYRCR Program team to develop community reconstruction plans and identify opportunities to make their communities more resilient. All meetings were open to the public. An additional 125-plus Public Engagement Events attracted thousands of community members, who provided feedback on the NYRCR planning process and proposals. The NYRCR Program's outreach has included communities that are traditionally underrepresented, such as immigrant populations and students. All planning materials are posted on the NYRCR Program's

website (www.stormrecovery.ny.gov/nyrcr), providing several ways for community members and the public to submit feedback on materials in progress.

Throughout the planning process, Planning Committees were supported by staff from the Governor's Office of Storm Recovery (GOSR), planners from New York State (NYS) Department of State (DOS) and NYS Department of Transportation (DOT), and consultants from world-class planning firms that specialize in engineering, flood mitigation solutions, green infrastructure, and more.

With the January 2014 announcement of the NYRCR Program's expansion to include 22 new localities, the program comprises over 2.7 million New Yorkers and covers nearly 6,500 square miles, which is equivalent to 14% of the overall State population and 12% of the State's overall geography.

The NYRCR Program does not end with this NYRCR Plan. Governor Cuomo has allocated over \$650 million of funding to the program for implementing projects identified in the NYRCR Plans. NYRCR Communities are also eligible for additional funds through the program's NY Rising to the Top Competition, which evaluates NYRCR Communities across eight categories, including best use of technology in the planning process, best approach to resilient economic growth, and best use of green infrastructure to bolster resilience. The winning NYRCR Community in each category will be allocated an additional \$3 million of implementation funding. The NYRCR Program is also working with both private and public institutions to identify existing funding sources and create new funding opportunities where none existed before.

The NYRCR Program has successfully coordinated with State and Federal agencies to help guide the development of feasible projects. The

program has leveraged the Regional Economic Development Council's State Agency Review Teams (SARTs), comprised of representatives from dozens of State agencies and authorities, for feedback on projects proposed by NYRCR Communities. The SARTs review projects with an eye toward regulatory and permitting needs, policy objectives, and preexisting agency funding sources. The NYRCR Program is continuing to work with the SARTs to streamline the permitting process and ensure shovels are in the ground as quickly as possible.

On the pages that follow, you will see the results of months of thoughtful, diligent work by NYRCR Planning Committees, passionately committed to realizing brighter, more resilient futures for their communities.

The NYRCR Plan

This NYRCR Plan is an important step toward rebuilding a more resilient community. Each NYRCR Planning Committee began the planning process by defining the scope of its planning area, assessing storm damage, and identifying critical issues. Next, the Planning Committee inventoried critical assets in the community and assessed the assets' exposure to risk. On the basis of this work, the Planning Committee described recovery and resiliency needs and identified opportunities. The Planning Committee then developed a series of comprehensive reconstruction and resiliency strategies, and identified projects and implementation actions to help fulfill those strategies.

The projects and actions set forth in this NYRCR Plan are divided into three categories. The order in which the projects and actions are listed in this NYRCR Plan does not necessarily indicate the NYRCR Community's prioritization of these projects and actions. Proposed Projects are projects proposed for funding through a NYRCR Community's allocation of CDBG-DR funding. Featured Projects are projects and actions that the Planning Committee has identified as important resiliency recommendations and has analyzed in depth, but has not proposed for funding through the NYRCR Program. Additional Resiliency Recommendations are projects and actions that the Planning Committee would like to highlight

and that are not categorized as Proposed Projects or Featured Projects. The Proposed Projects and Featured Projects found in this NYRCR Plan were voted for inclusion by official voting members of the Planning Committee. Those voting members with conflicts of interest recused themselves from voting on any affected projects, as required by the NYRCR Ethics Handbook and Code of Conduct.

The NYRCR Red Hook Community is eligible for up to \$3 million in CDBG-DR implementation funds.

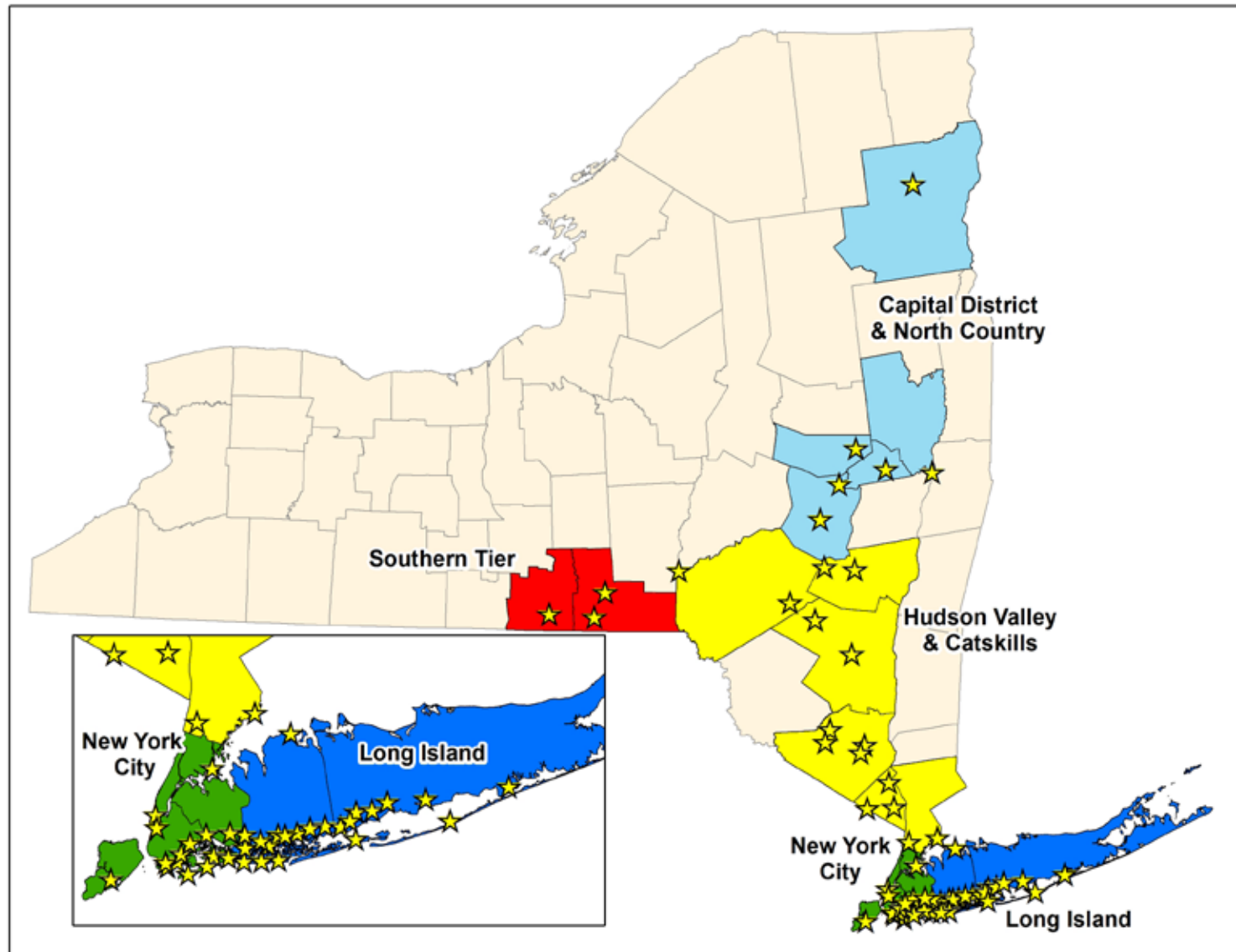
While developing projects for inclusion in this NYRCR Plan, Planning Committees took into account cost estimates, cost-benefit analyses, the effectiveness of each project in reducing risk to populations and critical assets, feasibility, and community support. Planning Committees also considered the potential likelihood that a project or action would be eligible for CDBG-DR funding. Projects and actions implemented with this source of Federal funding must fall into a Federally-designated eligible activity category, fulfill a national objective (meeting an urgent need, removing slums and blight, or benefiting low to moderate income individuals), and have a tie to the natural disaster to which the funding is linked. These are among the factors that the Governor's Office of Storm Recovery will consider, in consultation with local municipalities

and nonprofit organizations, when determining which projects and actions are best positioned for implementation.

The total cost of Proposed Projects in this NYRCR Plan exceeds the NYRCR Community's CDBG-DR allocation to allow for flexibility if some Proposed Projects cannot be implemented due to environmental review, HUD eligibility, technical feasibility, or other factors. Implementation of the projects and actions found in this NYRCR Plan are subject to applicable Federal, State, and local laws and regulations, including the Americans with Disabilities Act (ADA). Inclusion of a project or action in this NYRCR Plan does not guarantee that a particular project or action will be eligible for CDBG-DR funding or that it will be implemented. The Governor's Office of Storm Recovery will actively seek to match projects with funding sources.

In the months and years to follow, many of the projects and actions outlined in this NYRCR Plan will become a reality helping New York not only to rebuild, but also to build back better.

NYRCR Communities



Contents

Foreword	1
Executive summary	9
I. Community overview	
A. Introduction	18
B. Geographic scope of NYRCR Plan	22
C. Description of storm damage	24
D. Critical issues	32
E. Community vision	34
F. Relationship to regional plans	36
II. Assessment of risk and needs	
A. Description of community assets & assessment of risk	44
B. Assessment of needs and opportunities	61
III. Reconstruction and resiliency strategies	
A. Reconstruction and resiliency strategies	70
IV. Implementation - project profiles	
Relief center network	86
Emergency backup generator for health and social services provider	96
Resiliency construction workforce training	100
Local financial assistance for small businesses, start-ups, and homeowners/tenants	106

Solar-powered emergency lights for Red Hook Houses stairwells _____	112
Red Hook Houses Microgrid_____	118
New ferry landing and additional ferry service_____	124
Red Hook drainage study _____	132
Red Hook integrated flood protection system_____	138

V. Additional materials

A. Additional resiliency recommendations_____	146
B. Master table of projects_____	150
C. Public engagement_____	158
D. Community asset inventory_____	163
E. Additional regional and local plans _____	172
F. Endnotes _____	184
G. Glossary _____	186

Tables

Table III-1 – Strategy: Strengthen community capacity to prepare for, respond to, and recover from emergencies (Proposed and featured projects)	72
Table III-2 – Strategy: Strengthen individual economic resiliency and financial stability (Proposed and featured projects)	73
Table III-3 – Strategy: Increase the resiliency of existing businesses and promote opportunities for economic development &	75
Table III-4 – Strategy: Increase the physical and economic resiliency of private and public housing (Proposed and featured projects)	77
Table III-5 – Strategy: Create opportunities for alternative and/or redundant power generation and distribution (Proposed and featured projects)	78
Table III-6 – Strategy: Increase transit connectivity and redundancy to facilitate evacuation and rebuilding (Proposed and featured projects)	79
Table II-7 – Strategy: Improve drainage and reduce flooding from sewer backup (Proposed and featured projects)	80
Table III-8 – Strategy: Provide coastal flood protection (Proposed and featured projects)	81
Table V-1– Additional Resiliency Recommendations	146
Table V-2 – Master table of projects described in the plan	150
Table V-3 – Extended table of resiliency recommendations	155
Table V-6 - Asset inventory and risk assessment	163
Table V-4– Table of additional regional plans and initiatives	172
Table V-5– Table of local plans and initiatives	179

Figures

Figure I-1: Red Hook historic ecosystems _____	20
Figure I-2: Overview of planning area _____	23
Figure I.3: Superstorm Sandy flood extents _____	25
Figure II.1: NYS DOS risk areas _____	45
Figure II.2: Health and social services assets _____	47
Figure II.3: Economic assets _____	49
Figure II.4: Housing assets _____	51
Figure II.5: Infrastructure system & natural and cultural assets _____	53
Figure II.6: Risk scores _____	60
Figure IV-1: Illustrative potential relief center sites _____	89
Figure IV-2: Net-meter buildings in Red Hook Houses _____	121
Figure IV-4: Reported drainage complaints _____	133
Figure IV.5: Flood depths in Red Hook _____	139

Executive summary

The Red Hook NY Rising Community Reconstruction (NYRCR) Plan showcases the results of an intensive community-based resiliency planning process and is driven by the local knowledge and collaboration of Red Hook residents. Red Hook was devastated by Superstorm Sandy with critical housing, economic, social, natural, and infrastructure systems impacted.

Over a year later the impact continues to reverberate throughout the community, as residents and businesses struggle to address the physical and financial damage the storm caused and grapple with the uncertainty of what future storms and other disruptive events may bring.

Through the recovery process the Red Hook community showed great strength, coordination, and goodwill and spearheaded a remarkable grassroots response. The NYRCR Plan captures the Community's experience during and after Sandy and its vision for making Red Hook stronger and more resilient in the future.

Red Hook and the NY Rising Community Reconstruction Plan

The Governor's Office of Storm Recovery has allocated up to \$3 million in Federal Community Development Block Grant-Disaster Recovery (CDBG-DR) monies to fund eligible recovery and resiliency projects in the Red Hook Planning Area.

The Planning Area, spanning 1.3 square miles and including 12,400 residents, is a dynamic mixed-use neighborhood with a unique character and discernible small-town feel. Notable Community features include prominent industrial, manufacturing, and maritime assets along with growing mixed-use commercial corridors, a wealth of open space, and a diverse population comprised of both new and longtime residents. The neighborhood's character is framed by the historic significance and evolving composition of its working waterfront, peninsular nature, and relative isolation from the rest of Brooklyn due to the Gowanus Expressway.

Red Hook is a changing Community. Over the years residential uses have grown while industrial and manufacturing activity has decreased. Proposed developments such as a new hotel, galleries, and new housing would significantly alter the fabric of the Community. While these developments may usher in welcome economic improvements, they also pose risks for the affordability and overall mixed-use balance of Red Hook. Addressing resiliency within this diverse context presents unique challenges and opportunities.



In the wake of Sandy, Red Hook businesses and residents went to great lengths to support the Community (top). Debris cleanup required after Sandy was extensive (bottom). Source: Carolina Salguero (top); Jim Tampakis (bottom).

Superstorm Sandy's impact and the recovery

Storm surge from Superstorm Sandy inundated almost the entire neighborhood, resulting in extensive damage to homes and businesses and profoundly impacting lives and livelihoods. Flooding resulted in extensive building damage and disruption to the neighborhood's infrastructure, which had a disproportionate impact on vulnerable populations including the residents of the New York City Housing Authority's (NYCHA) Red Hook Houses. The Community's businesses were also disrupted and remain profoundly affected by the storm's impacts.

While Superstorm Sandy revealed Red Hook's many vulnerabilities, it also revealed its capacity for unprecedented cooperation and action. Red Hook residents, community-based organizations, businesses, and regional partners rallied in response, piecing together an essential system of distribution and support with limited resources. There are innumerable stories of neighbors helping neighbors and support pouring in from communities near and far. The Community's mobilization and organization has become a regional precedent for grassroots organizing and response.

A community driven process

The NYRCR Plan builds on the neighborhood capacity and experience developed in the wake of Sandy. The Red Hook Planning Committee—comprised of residents, civic leaders, and business owners—served as the leaders of this process and took on the challenging role of creating a unified vision for Red Hook’s resiliency needs and priorities across this varied Community. The Committee embraced the opportunity the NYRCR Program provided not only to develop a resiliency plan, but also to engage a broad swath of the Community, integrating a myriad of ideas in order to generate a unified and inclusive set of priorities for shaping Red Hook’s future. **The Planning Committee guided an extensive community engagement process fueled by 14 Planning Committee Meetings, three Public Engagement Events, and multiple additional engagement meetings.**

Many efforts are already underway by public agencies, utilities, and non-profits in the Red Hook Community and the Planning Committee worked to understand the initiatives and to avoid the duplication of efforts. Avoiding redundancy and leveraging knowledge already gained is a priority of the Committee as Red Hook builds toward a resilient future.



Residents input at Public Engagement #1 in October, 2013 (above) and Public Engagement #3 in February 2014 (below) shaped the NYRCR Plan.

Source: Carolina Salguero (bottom photo)

Community vision statement

“Empowered by the spirit of unity that helped the Red Hook community survive Superstorm Sandy, our vision for a **resilient and thriving** future is to work as a holistic community to **strengthen the historic waterfront** Red Hook Peninsula by minimizing differences and **maximizing cooperation** among all who live and work here. **Mindful of the growing climate-related** risks to our beloved community and the immediate need for improved emergency preparedness measures, our actions will serve to help to develop measures that will protect our neighborhood from flood inundation, **increase the safety of our citizens**, and move towards a **resilient community**. We are committed to **maintaining and expanding affordable housing** and **increased economic activity** with an emphasis on **local job development**, recognizing the importance of their interdependence. Our rebuilding efforts towards a resilient and sustainable community are focused on a sincere triple bottom line **integration of environment, economy, and community**, which will require **substantial improvement to our long-neglected infrastructure** including sewers, transportation, communications, power and energy provision, and education.”



Community members gather at Red Hook Fest at Valentino Pier Park. Source: Carolina Salguero

Critical issues

Red Hook residents and Planning Committee members identified numerous vulnerabilities and resiliency issues that were brought to light in the wake of Superstorm Sandy. **The Committee's focus extended far beyond resiliency to issues of economic development, equity, and sustainability.** Recognizing that climate change will force the adaptation of Red Hook's physical and cultural landscape, the Planning Committee sought resiliency improvements that could serve the greatest number of residents, provide economic co-benefits such as job creation, and be implemented quickly, resulting in immediate benefits. Much attention was given to emergency preparedness, capacity building, small business resiliency, chronic sewer system issues, and broader economic development strategies.

A blueprint for future resiliency

The NYRCR Plan for Red Hook offers a blueprint for implementation of the goals and vision of Red Hook residents. The Plan identifies critical resiliency strategies and recommends Proposed and Featured Projects. Proposed Projects are projects that the Planning Committee has recommended be funded through their Community's CDBG-DR allocation. Featured Projects are innovative projects that the Committee is highlighting in the NYRCR Plan and potential second phases that would result from Proposed Projects.

Recovery support functions

The New York State Department of State (NYS DOS) has recommended a structure for each plan focused on a set of criteria, known as Recovery Support Functions. These Recovery Support Functions were utilized when developing needs, opportunities, strategies and projects to ensure that a comprehensive approach is reinforced throughout the effort to shape a comprehensive resiliency strategy for the Community.



New York Rising Community Reconstruction Plan Six Recovery Support Functions

Strategies and projects

Strengthen community capacity to prepare for, respond to, and recover from emergencies

Relief center network (Proposed). Fund the creation of a network of relief centers to house the coordination of relief services following a disaster, such as provision of food, water, power, medical services, and information.

Emergency backup generator for health and social services provider (Proposed). Purchase and install one fixed generator for a health and social service provider in Red Hook to ensure continuity of critical services to the Community during and after an emergency.

Strengthen individual economic resiliency & financial stability

Resiliency construction workforce training (Proposed). Fund training of Red Hook youth and adults—particularly low-income individuals with limited employment experience and/or education—and connect them to employment opportunities related to the construction of resilient infrastructure or building improvements.

Increase the resiliency of existing businesses and promote opportunities for economic development, & Increase the physical and economic resiliency of private and public housing

Local financial assistance program for small businesses, star-ups, and homeowners/tenants (Proposed). Provide financial support to Red Hook small businesses and homeowners/tenants seeking to implement resiliency upgrades, as well as to entrepreneurs seeking to start micro-businesses.

Solar-powered emergency lights for Red Hook Houses stairwells (Proposed). Fund the implementation of a solar-powered emergency lighting pilot project in two or three buildings in Red Hook Houses. A second phase of this project would expand the program to all 30 residential buildings (Featured).

Create opportunities for alternative and/or redundant power generation and distribution

Red Hook Houses microgrid feasibility study (Proposed). Conduct a feasibility study for a microgrid that can provide backup power for Red Hook Houses—home to 50% of the Red Hook Community—during an emergency. Implementation of the project could occur during a second phase (Featured).

Increase transit connectivity and redundancy to facilitate evacuation and rebuilding

New ferry landing at or near Atlantic Basin (Proposed). Provide partial funding for the construction of a new ferry landing, at or near Atlantic Basin, contingent on Port Authority of New York and New Jersey (PANYNJ) and New York City Economic Development Corporation (NYCEDC) approval to use the site and a commitment of matching funds by a private/public entity to ensure completion of the ferry landing. A key second phase would secure operating subsidies to extend commuter ferry service to the new landing (Featured).

Improve drainage and reduce flooding from sewer backup

Red Hook drainage study (Proposed). Analyze the existing conditions that contribute to frequent flooding in Red Hook. By uncovering unknown details of existing conditions, the study would identify specific measures to improve drainage in the neighborhood.

Provide coastal flood protection

Integrated flood protection system (Featured). The Committee applauds the recent announcement of a \$200 million partnership between the State and the City of New York to construct a comprehensive flood management system—the first of its kind in the nation—to protect Red Hook. This project would reduce risk for much of the Community and is critical to the overall safety of this evolving neighborhood. The Community has drafted principles to guide the development of the project.

These initiatives are only a small segment of what is needed to achieve Red Hook’s full range of physical, economic and social resiliency goals. Additional recommendations proposed in the NYRCR Plan include:

- Preparation of a local emergency preparedness plan
- Implementation of a virtual citywide resiliency information clearinghouse, with specific information for local communities
- Creation of a resilient healthcare resource program with a mobile health clinic
- Development of partnership between Community Emergency Response Team (CERT) participants and emergency services/nurse training
- Study of land and facilities activation at and around Atlantic Basin
- Study of the economics of resiliency upgrades for industrial properties
- Construction of resiliency improvements at Red Hook Houses
- Support for National Flood Insurance Program (NFIP) reforms that mitigate premium increases
- Creation of a community/cultural/food space in Red Hook Houses
- Improvement of communication and collaboration between Red Hook residents, PANYNJ, and NYCHA, the largest property owners in Red Hook
- Establishment of direct bus service from Red Hook to Lower Manhattan
- Completion of repairs to the Van Brunt Street Pumping Station

Outline of the plan

The NYRCR Plan begins with **Section I. Community overview**, which provides an orientation to Red Hook’s distinctive character, the critical issues that were revealed by Sandy, and the Planning Committee’s work in the context of recent and parallel resiliency and recovery efforts and studies. Initiatives such as Federal Emergency Management Agency (FEMA) updates to Federal Insurance Rate Maps (FIRM), the legislation surrounding proposed repeals of NFIP subsidies, and the City of New York’s Special Initiative for Rebuilding and Resiliency are noted here.

The next **Section II. Assessment of risks and needs**, describes the diverse assets at risk from future storms as identified by the Planning Committee and the public. This section identifies key needs and opportunities that form the rationale for resiliency strategies and the related projects developed by the Planning Committee.

Section III. Reconstruction and resiliency strategies presents priority strategies that organize the risks, needs, and opportunities which were outlined in previous sections. The reconstruction and resiliency strategies lead into the development of Proposed and Featured Projects.

The Proposed and Featured Projects, which are the path to executing resiliency strategies, are described in more detail in **Section IV. Implementation - project profiles**.

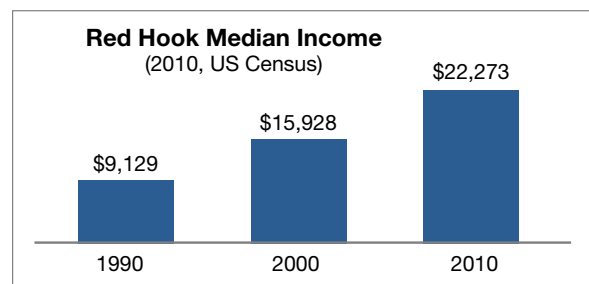
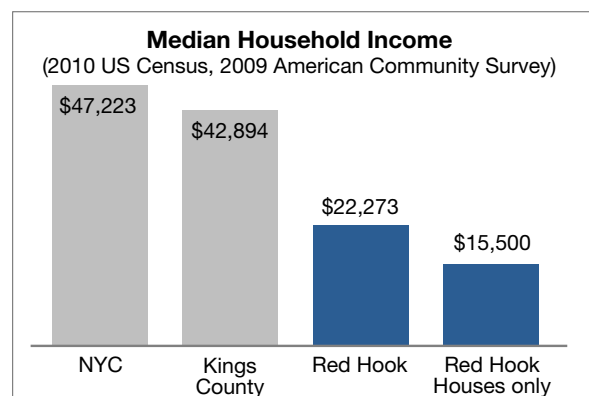
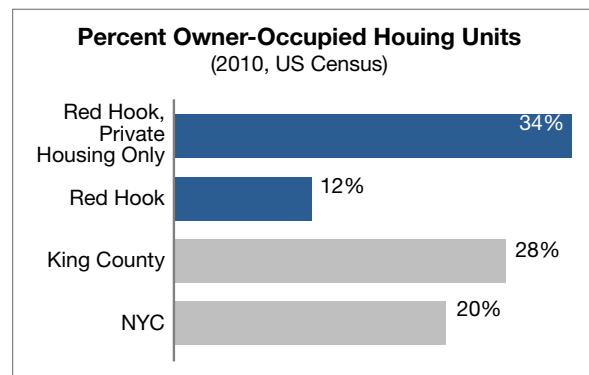
Section V. Additional materials includes Additional Resiliency Recommendations, and the Extended Table of Resiliency Recommendations which presents the sum total of key projects discussed by the Community. Detailed information on Public engagement is also provided in this section.



Source: Carolina Salguero

I. Community overview

A. Introduction



Red Hook is a rapidly evolving neighborhood, characterized as much by its diversity and neighborhood spirit as by its extensive waterfront and mix of uses. Long defined by the industrial character of its waterfront, Red Hook is in a time of transition. It is a place of long-time residents and newcomers, homeowners and public housing residents, where artists share space with industrial manufacturers and new artisanal restaurants are cropping up next to bars that have existed for over 100 years. Also defined by its open spaces, low-rise character and access to waterfront views, residents and business owners alike have much to value and protect in Red Hook.

The Planning Area covers a 1.3 square mile area and is home to approximately 12,400 people, according to the 2010 U.S. Census.¹ Roughly half the population (6,500 people) live in Red Hook Houses— the second largest New York City Housing Authority (NYCHA) development and largest in Brooklyn.² Both of these figures are reported by local residents to be under-counted, since they may not capture individuals in informal living situations.

The residential population of Red Hook is diverse. By the numbers, about 40% of Red Hook residents identified their race as White,

36% as Black, and 3% as Asian. 40% also report Hispanic ethnicity (in the U.S. Census, individuals are permitted to enter race and ethnicity separately).³ Income and associated resources vary significantly across Red Hook. As of 2010, median income within Red Hook Houses was 33% of the New York City median, while as a whole Red Hook's median income was 47% of citywide median income.⁴

The vast majority of Red Hook residents rent their homes. Only 12% of housing units in Red Hook are owner-occupied. This is driven by Red Hook Houses, which accounts for about 54% of the occupied rental units in Red Hook. Among private housing only, the owner-occupancy rate rises to 34%, which is above the citywide and Kings County averages of 23% and 28%, respectively. While 60% of all units (including those within Red Hook Houses) are in medium to large apartment buildings, about 36% are in row houses containing two or more units, with the remainder comprised of single-family homes.⁵ Red Hook's buildings are notably historic, with 80% of units built before 1960 and 50% before 1940.⁶

But statistics cannot capture the character and diversity of Red Hook's population. Residents come from varied backgrounds and include

both lifelong residents and a significant cohort of new-comers who arrived in the past decade as homeowners, tenants, and small-business owners. A neighborhood focus and a strong activist culture are fundamental to the identity of many residents and organizations. Red Hook has a high number of nonprofits who focus on a variety of Community issues and aspirations as part of their mission. The prevalence of nonprofits and this strong activist culture helped Red Hook's immediate response to Sandy.

Red Hook is also defined by the character and type of its business community. Residential uses comprise just over 10% of Red Hook's land area. Industrial and manufacturing comprise more than 30% of the total land area; retail, office, open space, and parking/transportation/utility uses each occupy approximately 10% of the area; and the remaining 20% of the Planning Area is occupied by vacant land and other uses.⁷

Van Brunt Street and Lorraine Street are the main commercial corridors in Red Hook. Clinton Street and the north end of Columbia Street also contain clusters of retail business. These areas host an array of small, local restaurants and retail establishments, laundromats, and grocery stores. Van Brunt Street is defined primarily by three-story, mixed-use buildings containing



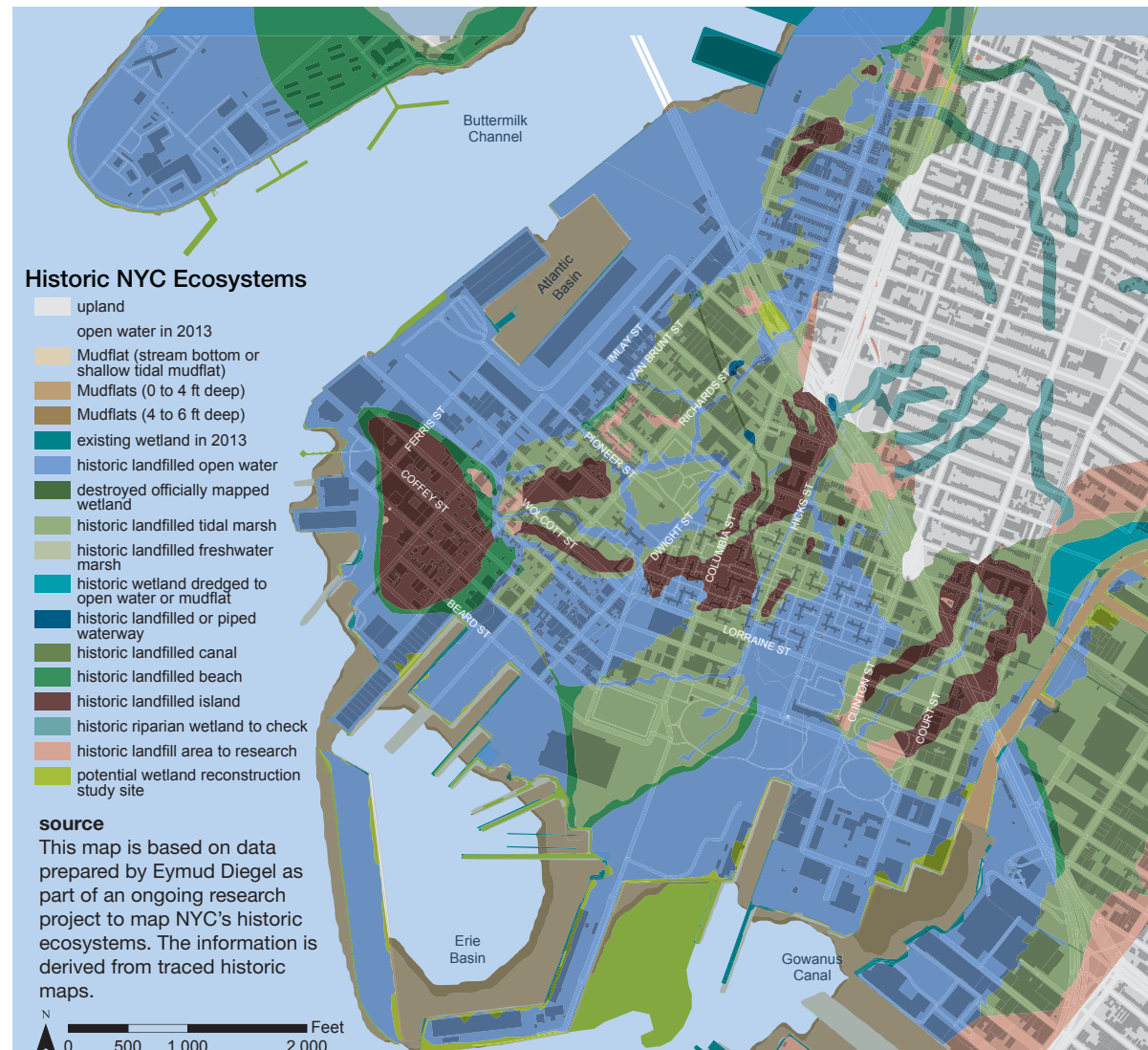
Red Hook Houses is home to over half of Red Hook Planning Area residents (top). Many residents live in historic attached row-houses (below).



Mobile food trucks on Bay Street are a regional attraction (top). Van Brunt Street is a mixed-use commercial corridor with many local restaurants and retailers (bottom). Source: Flickr Wally G. under Creative Commons (bottom)

Figure I-1: Red Hook historic ecosystems

The map below overlays historic ecosystems on the current footprint of buildings and streets in Red Hook, illustrating the extent to which what is now Red Hook once consisted of tidal wetlands and open water.



residential units on upper floors and unique and local stores and restaurants at street level. The Lorraine Street corridor is comprised primarily of single-story, single-use buildings, many of which are also small businesses. A few larger retail establishments—notably IKEA and Fairway Market—draw shoppers from the greater region.

Red Hook's character and industry is in part shaped by its proximity to water. Prior to the 19th century, most of what is now Red Hook was open water and tidal wetlands. What is now the Gowanus Canal was a tidal creek. Atlantic Basin opened in the 1850s, and Red Hook quickly became one of the busiest ports in the region serving the Erie Canal and local destinations. The prominence of the maritime economy in Red Hook subsided in the 1950s with the advent of containerization, which shifted maritime power to larger ports that had the space needed for loading and unloading. The shift contributed to substantial out-migration, with Red Hook's population declining by 42% between 1960 and 1990.⁸ Red Hook's population has since stabilized and rebounded.

Today the maritime industry is a smaller but still important feature of Red Hook, with a number of facilities continuing to serve the region. It is also visible in the manufacturing and warehouse buildings that line the neighborhood's waterfront and both active and inactive piers.

Red Hook's present-day industrial and maritime sectors are concentrated on the waterfront. Major maritime uses include the Red Hook Container Terminal, Brooklyn Cruise Terminal—controlled by the Port Authority of New York & New Jersey (PANYNJ)—Erie Basin Barge Port, and Gowanus Bay Terminal, as well as a marine fuel terminal, tugboat headquarters, the homeport of New York Water Taxi, and two ferry landings. While maritime and water-dependent industries are a core part of Red Hook's economy and character, its industrial and manufacturing businesses are quite diverse in scale and type. Manufacturers include a great number of start-ups—carpenters, design/build shops, glass blowers/cutters, alcohol and food producers, and boutique producers of skateboards and bicycles, to name a few. Many of the craft manufacturing and traditional manufacturing start-ups and small businesses share space in larger buildings along the waterfront. There are also a number of single, large industrial facilities, such as the Buckeye Fuel Terminal (formerly Hess Oil Terminal). The largest employment sectors in

Red Hook are construction, wholesale trade, and transportation/warehousing.⁹ However, these businesses mostly employ people from outside of the community. Over 90% of Red Hook residents work outside of the neighborhood.

Red Hook's identity is also shaped by its isolation from inland Brooklyn. This is in part due to the Gowanus Expressway. With the other three sides of the neighborhood defined by waterbodies, the expressway forms the northeastern border of the neighborhood. The Expressway's construction in the early 1940s cut off residents and businesses from the Brooklyn economy and contributed to Red Hook's strong neighborhood identity.

Red Hook is also notable for its “big sky” feel due to its peninsular nature, the dominance of low-rise buildings, and the abundance of open space. The park and outdoor recreational amenities in Red Hook are a regional draw.



Historic industrial buildings line Red Hook's waterfront (top). Red Hook has many valuable recreational amenities such as the Red Hook Recreation Center and Pool (bottom). Source: Thomas Rupolo (top); Carolina Salguero (bottom)

B. Geographic scope of NYRCR Plan

Red Hook is located on the Brooklyn waterfront, approximately two miles south of the Brooklyn Bridge and southeast of Governors Island.

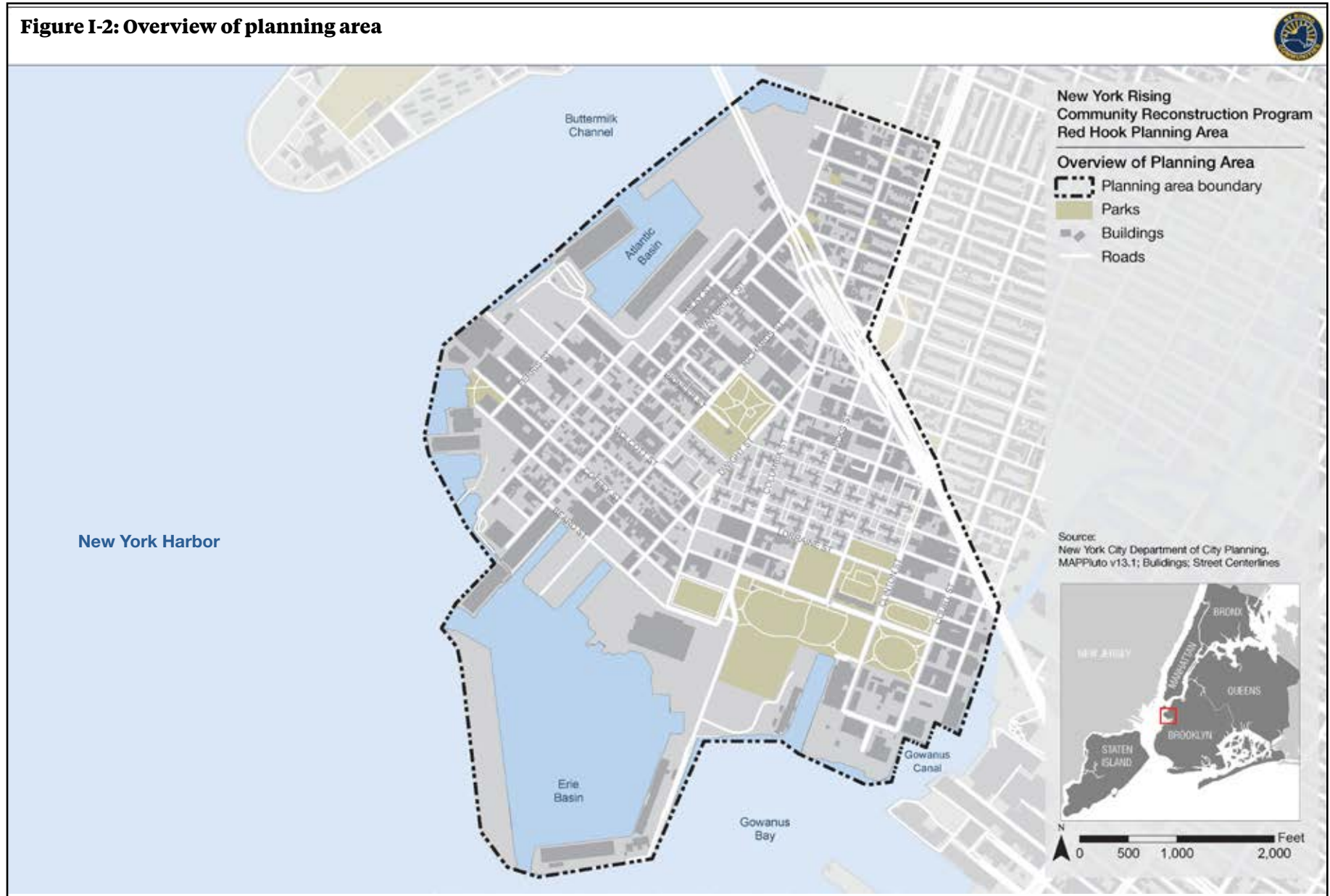
Red Hook is bounded by the water bodies of Buttermilk Channel/Upper Bay (west), Gowanus Bay (south), and Gowanus Canal (east). The Gowanus Expressway, part of Interstate 278, serves as the northeastern boundary for the majority of the Planning Area. The northwest portion of the Planning Area includes the area between Hicks Street and Buttermilk Channel south of Degraw Street.

The NYRCR Planning Committee defined the Planning Area based on multiple factors, including: data on damage resulting from Superstorm Sandy; local understanding of community boundaries; areas where assets are most at risk; locations where reconstruction should be encouraged; and opportunities for key investments to improve the local economy. The map on the adjacent page indicates the Planning Area designated by the Committee.



Red Hook is a peninsula surrounded on three sides by water with some of its waterfront devoted to maritime activities. Source: Thomas Rupolo

Figure I-2: Overview of planning area



C. Description of storm damage

Summary of storm impacts

Storm surge from Sandy inundated almost the entire neighborhood, resulting in extensive damage to homes and businesses and profoundly impacting lives and livelihoods. Water entered Red Hook from the harbor and Gowanus Canal, inundating all but a few elevated blocks in the vicinity of Coffey Street in the south, a half block of central Van Brunt Street and Hamilton Avenue in the north. In a few locations, flood depths exceeded six feet, and some buildings with basements and garden apartments were flooded from floor to ceiling. While limited waterfront areas in Red Hook also experienced flooding from Hurricane Irene and Tropical Storm Lee, the extent of flooding and resulting damage and disruption caused by Sandy was unprecedented.

Flooding resulted in extensive building damage. While affected residential and commercial buildings in Red Hook in general were damaged but not destroyed, damage was extensive.¹⁰ Homeowners and renters suffered from flooded basements and first floors—residents report that numerous garden apartments were flooded to the ceiling. Furniture, appliances, and cherished belongings were destroyed. Many homes were severely damaged requiring gutting walls and

pulling up flooring, and yards and gardens were ruined. Low-lying streets with historic buildings that regularly experience flooding during more frequent storms, such as Pioneer Street and Richards Street, were particularly devastated.

“the damage really was not only to possessions, but to people’s lives.”

– Committee Member

According to residents, many homeowners relied on rental income from ground-floor rental units. For many, the loss of this revenue source after Sandy made homeownership unaffordable. On top of the financial hardships created by damages and loss of income, the psychological impacts of losing irreplaceable personal belongings, stress from being displaced, and frustration with lack of recovery resources has been profound.

Businesses of all types were hard hit by Sandy. Retail businesses throughout the neighborhood, including many small businesses on Van Brunt and Lorraine Streets, were severely impacted by flooding. Damage to buildings, equipment, and inventory was a significant setback for small businesses who often have limited financial



Flooding and debris caused extreme damage along the waterfront but also impacted inland properties. Source: Red Hook Star Revue (top); Flickr user Michael Fleshman under Creative Commons (bottom)

Figure I-3: Superstorm Sandy flood extents





Lack of electricity was a key and long-lasting impact for residents, particularly for Red Hook Houses residents. Residents lost much of their belongings to water damage. Source: Red Hook Star Revue (top); Adam Armstrong (bottom)

resources and many are still working to recover. According to resident discussions with a U.S. Small Business Administration (SBA) loan officer, there was a notably high number of start-ups and small businesses in Red Hook where residents had invested a significant amount of their wealth. In a number of unfortunate cases, local business owners who both live and work in Red Hook were doubly impacted.

“...business losses [in Red Hook] reflect a high number of shattered dreams and exhausted nest eggs ... In a small, tight-knit community the losses of residents and businesses in the neighborhood were collectively felt.”

– Committee Member

Food supply and food-related businesses were particularly impacted. Area groceries and markets sustained significant damage to equipment and inventory and lost perishable items due to power outages as well. Fairway Market at the southern tip of Van Brunt Street and Fine Fare Supermarket on Lorraine Street were closed for many months. Additionally,

almost every food-serving businesses in the neighborhood was closed. The extended closure of these businesses forced families to have to car pool, spend extra money on car service, walk long distances or rely on donations for food.

Nearly half of all affected businesses were industrial, with disruptions impacting production, storage, and distribution of goods. Because many industrial and manufacturing businesses had expensive equipment and supplies on the ground floor, the damage and monetary loss to this sector was substantial. Damage to industrial and manufacturing businesses caused ripple effects through regional distribution chains. Maritime industries were also affected, experiencing substantial damage from flooding as well as experiencing the brunt of storm surge debris due to their waterfront locations, where water velocity and wave energy was most significant.

These impacts were exacerbated by damage and service impacts to the neighborhood's infrastructure. Floodwaters inundated most local streets in Red Hook and completely overwhelmed the sewer system. Floodwaters mixed sewage with oil, dirt, trash, furniture and whatever else they encountered on Red Hook's streets. The Van Brunt Street Pumping Station was completely inundated and had to have all of its electrical equipment replaced following the storm. Without proper drainage, floodwater lingered in low-lying

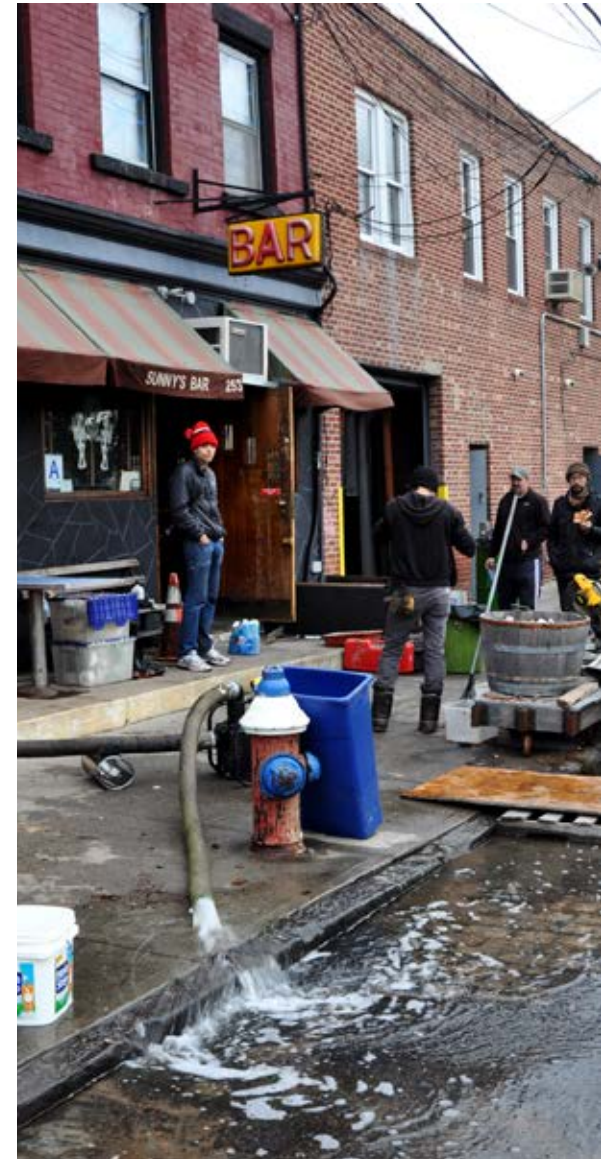
areas and basements, prolonging the recovery process. Without electricity following the storm, pumps to pump water from these still flooded locations had to be powered by generators, which were in short supply, and water remained in many locations for extended periods of time, likely exacerbating damage.

Electricity was out in most of the neighborhood for weeks following the storm. Electrical outages during Sandy were caused by damage to the electricity generation and distribution system, including flooding of substations and downed power lines. Red Hook suffered from this system-wide damage, but the length of service disruptions was extended due to salt-water damage to building electrical systems, delaying the restoration of electricity to individual buildings. Even once electricity began to be turned on, water damage to systems frequently caused transformers to “ground out” and “explode”—an occurrence which residents note happened repeatedly in the weeks following Sandy.

The gas supply system faced similar challenges. Residents and business owners report that water entered gas lines through vents in the sidewalk, causing gas lines be shut down. As gas had to be turned on by the gas supply company one building at a time, restoration of gas service was delayed by the large number of connections that needed to be addressed.

The compounding impacts of damage to homes, businesses and infrastructure were perhaps most heavily felt in Red Hook Houses. Some units were without running water for a full week and most buildings in the complex were without heat and power for weeks. Flooding of basement mechanical rooms destroyed switch gears preventing power from being restored for multiple weeks.¹¹ These extended outages posed significant challenges for residents, especially the elderly and those with disabilities who were stranded on upper floors due to the lack of elevator service. Isolation in these uncomfortable and potentially dangerous conditions for such a long period of time had profound psychological impacts on many residents.

Key community facilities also experienced significant damage and prolonged lapses in service due to the storm, impacting youths and seniors in particular. P.S. 15 and the PAVE Academy Charter School were both closed for multiple weeks following Superstorm Sandy, and students attended school at other locations while the necessary repair work was completed. This created additional stress for already strapped families as children were no longer able to attend school locally or utilize the afterschool services provided by these facilities. More than five feet of water inundated the Red Hook Senior Center on Wolcott Street, forcing the Center to abandon its home of over 21 years. The Red Hook Recreation



Source: Flickr user Michael Fleshman under Creative Commons

Center also closed for several weeks as a result of water damage to its structural and mechanical systems.

The neighborhood's only health clinic—the Joseph P. Addabbo Family Health Center—experienced significant damage and was closed for over a week. The first floor and pharmacy were destroyed by floodwaters. Many non-profits providing critical community development and social services were impacted. Damage to these community and health facilities caused a ripple effect, hobbling recovery systems and impacting the many residents that required health and social services.

Transportation systems were also disrupted by Sandy. The overall lack of accessibility plus the short-term interruption of bus service and much of the subway system exacerbated difficult commutes and created economic hardship. The flooded Hugh L. Carey Tunnel was closed for nearly three weeks. Due to the location of the tunnel entrance in Red Hook, this closure created traffic jams and vehicular backup on roadways in and around the neighborhood, limiting the ability of much-needed supplies, expert help, and emergency workers to reach their destinations, and extending commute times for residents and employees who were driving to and from Red Hook, sometimes by hours.

Recovering from the storm

In response to the devastation caused by Superstorm Sandy, volunteer and community-based organizations (CBOs) in Red Hook, as well as individual residents and businesses, mobilized to support the neighborhood. Existing CBOs such as Red Hook Initiative, PortSide NewYork, the Southwest Brooklyn Industrial Development Corporation (SBIDC), Good Shepherd Services, and the Added Value Community Farm used their resources and leadership to provide vital goods and services to affected residents and businesses of Red Hook, as did a number of local religious institutions, including Visitation of the Blessed Virgin Mary Church (Visitation Church) and Calvary Baptist Church. Other organizations, including Occupy Sandy, Restore Red Hook, and Red Hook Volunteers, formed explicitly in response to Superstorm Sandy for the purpose of helping those in need following the storm.

Both the long-established and newly formed CBOs coordinated their activities and provided support through informal relief centers in Red Hook—physical spaces staffed by volunteers that served as hubs for the distribution of information and resources. Relief and distribution centers were operated by Red Hook Initiative, PortSide NewYork, the Miccio Center, Visitation Church, P.S. 27, and many other organizations and facilities. These centers offered shelter,

food, medical assistance, and physical supply distribution, and provided critical information to residents. Perhaps most importantly these centers became neighborhood gathering places where people were able to comfort one another, share stories, advice, skills, and resources. The strength of Red Hook's community was felt at these locations and a cascade of additional recovery efforts were launched from these sites.

The support of community organizations supplemented extensive informal assistance offered by individual neighbors and businesses. There are countless stories of citizens stepping up to direct traffic; local businesses opening their doors to serve as community hubs; and other examples of informal social networks providing essential community support. Larger businesses helped, too. IKEA turned into a major recovery partner, contributing funding and furniture to Red Hook households and institutions and opening its facilities to provide shelter and services. Despite these significant efforts, in the days immediately after the storm many community members still struggled to find basic information, such as where to find medical services, food, gas, ATMs, or places to charge cell phones.

While the unprecedented impact of Superstorm Sandy strained the government's response, requiring substantial community-led recovery efforts, the official response teams worked valiantly to meet community

needs in the face of citywide challenges. The NYC Sanitation Department's dedication and hard work was particularly noted by Red Hook residents. Sanitation workers toiled around the clock helping to clear debris; residents cited the department personnel for their work above and beyond the call of duty, helping residents and businesses clear massive amounts of materials so the rebuilding process could begin. NYCHA staff worked to restore the damaged buildings in Red Hook West and East, although residents also noted a delay in the official response. Displaced due to flooding, NYCHA provided the Red Hook Senior Center with temporary space at the Miccio Center, where it will remain until relocating to its new, permanent location with funding for site renovations allocated by the New York City Council.

In an effort to help businesses bounce back after Superstorm Sandy, the City and other funders supported a number of initiatives. Then Brooklyn Borough President Marty Markowitz, the Brooklyn Chamber of Commerce, and the Brooklyn Community Foundation joined forces and quickly convened leaders from throughout the affected communities in the Borough to create the Brooklyn Recovery Fund. Additionally, several other financial and technical assistance programs were rolled out in the months after Superstorm Sandy to help businesses with long-term recovery, including the SBA Disaster Loan Program and New York City Recovery Loan



Recovery resources were set up by local organizations (top), residents and businesses (bottom left), as well as Federal, State, and City agencies (bottom right).

Source: Carolina Salguero (top); Jojo Demirel (bottom photos)

and Grant Programs. However, only a fraction of applicants from Red Hook qualified. Informal means were used to supplement these initiatives—particularly with the leadership of ReStore Red Hook—raising funds for recovery and commercial revitalization through online campaigns and creative marketing

Despite community and governmental support, the recovery and rebuilding process is still ongoing, with business owners and residents experiencing ongoing financial hardship. Businesses reported a notable reduction in foot traffic and business in the months after Superstorm Sandy; though free summer ferry service alleviated this problem, it remained difficult for many businesses to bounce back from the lost revenue on top of the costs of repairs and upgrades.

Many business owners and homeowners have had difficulty accessing financial assistance that was available for recovery. Confusing

applications, eligibility issues, and limited funding are a few of the reasons that financial assistance was inaccessible to many small business owners. Homeowners and tenants also faced financial hardships as a result of Superstorm Sandy. With substantial damage to their buildings and, for some, the additional reduction in income from losing a rentable ground-floor unit, residents sought financial assistance but have often struggled to get the resources they needed in order to recover. Many homeowners are still rebuilding, and tenants are still displaced. On Visitation Street, for example, many ground-floor apartments remain vacant with boarded-up windows.

More recently, recovery efforts have been supplemented by resiliency efforts seeking to promote long-term growth and to mitigate future damage. In the residential sector, financial assistance and rebuilding programs such as NYC Build it Back have sought to provide immediate repairs and financial relief. However, due to the

scale and complexity of the challenge, these programs are still getting underway, and residents and businesses alike continue to struggle to fully bounce back. Despite ongoing hardships, in the 18 months since Superstorm Sandy, the resilient nature of Red Hook has been clearly demonstrated by a number of popular, well-attended events around the community. These events include the Red Hook Summit, the Red Hook Fest, and the Sandy Anniversary Barnacle Parade among others.

The many formal and informal efforts to assist with recovery in the immediate and longer-term aftermath of the storm are impressive. However, there is still much that remains to be done to rebuild and ensure the long-term resiliency of the neighborhood. While the ongoing recovery from the storm demonstrated the unwavering strength of the community, it has also brought to light significant challenges that persist.

One year anniversary of Sandy: Getting back to normal the Red Hook Way

Red Hook was hit by Superstorm Sandy on October 29, 2012, but the spirit that was most visible at the one-year anniversary, the “Sandyversary” was moxie and mirth. An underground parade, the Barnacle Parade, was organized on short notice. Satirical costumes referred to insurance woes, blown out transformers, jerry jugs, diesel oil spills, and Gowanus Canal overflow. A float depicting a generator loomed over all. A huge, blue tarp, shaken by a dozen people, provided a lo-fi illustration of Sandy’s flood waters.



Source: Red Hook Star Revue (left photo); Carolina Salguero

D. Critical issues

Red Hook residents and Planning Committee members identified numerous vulnerabilities and resiliency issues that were brought to light in the wake of Superstorm Sandy.

Underlying the critical issues identified in Red Hook are the goals of addressing climate change; enhancing the local economy; expanding local access to employment; and creating a more inclusive and interconnected community. Solutions to critical resiliency and recovery issues should address these goals.

Particular critical issues across the different Recovery Support Functions (definitions provided on page 42) include the following and are defined in more detail in the “Assessment of Needs and Opportunities” section of the NYRCR Plan:

- **Community planning and capacity building**
 - Inadequate emergency preparedness and response resources within the community, and a need for coordination amongst City, State, and Federal emergency response entities
 - Lack of interaction and communication between Red Hook Houses residents and the neighborhood as a whole
- **Health and human services**
 - Lack of resiliency of the healthcare network in the wake of a storm
- **Economic development**
 - Vulnerability of local retail and industrial/maritime businesses to future storm events, in addition to a lack of information about resiliency options and the financial means to pursue capital-intensive resiliency measures
 - Underemployment, especially among youth and residents of Red Hook Houses
- **Housing**
 - Vulnerability of Red Hook Houses and private housing stock to future flood events, and lack of information, both locally and citywide, about appropriate resiliency improvements as well as the financial support to undertake resiliency upgrades for homeowners and other resources for tenants
- **Infrastructure**
 - Chronic sewer backup and poor drainage problems
 - Danger of flooding, aggravated by Red Hook’s long coastline and low-lying topography
 - Vulnerability of the power system
 - Shortage of transportation options for both everyday travel as well as before and after an emergency
- **Natural and cultural resources**
 - Vegetation throughout the neighborhood vulnerable to storm damage
 - Inadequate public access to the waterfront

Critical issue: dealing with a changing climate

Climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer.

- Intergovernmental Panel on Climate Change (IPCC)

Climate change has been linked to human-induced factors including the release of greenhouse gases (largely due to the burning of fossil fuels) and deforestation.

Climate change is a real and significant concern for New York's coastal communities. Two impacts of climate change have the most bearing on the future risk to New York's coastal communities from future storm events and flooding: (1) Sea Level Rise and (2) increased frequency and intensity of storm events. On March 31, 2014, the IPCC released ***Climate Change 2014: Impacts, Adaptation and Vulnerability***¹, reiterating the risk to coastal communities across the globe and assigning a high confidence that risks from extreme weather events and of sea level rise will continue to increase in the future due to climate change.

Graphic Source: NYC, "A Stronger, More Resilient New York" (the SIRR Report)

Closer to home, the New York Panel on Climate Change (NPCC) continues to look at the potential risks presented to New York City in light of climate change. In their ***Climate Risk Information 2013***,² the NPCC made the following projections for 2050:

- Sea Level will increase between 7 and 31 inches with a mid-range projection of 11 to 24 inches.
- The annual chance of today's 100 year storm (which is a 1% chance) will increase to between 1.4 and 5.5% with a mid-range estimate of 1.7 to 3.2%.
- Flood heights associated with a 100 year storm event will increase between .6 and 2.6 feet with a mid-range projection of .9 to 2.0 feet.
- Precipitation (rain/snowfall) will increase by 1 to 15% with a mid-range projection of 5 to 10%.

These projected changes all increase the extent and likelihood of flooding in New York's coastal communities.



E. Community vision

The Red Hook Planning Committee has worked with the Community to develop an overarching vision for a stronger, more resilient Red Hook. This vision, along with a list of short-term and long-term resiliency goals, informs the solutions identified in the NYRCR Plan.

Goals

The Committee discussions and public input at the first Public Engagement Event established preliminary goals for Red Hook. The Committee then undertook a visioning exercise in which members adopted the perspective of the different communities living in Red Hook and brainstormed goals from these outlooks. Planning Committee members synthesized these goals to develop a vision statement and the following short- and long-term goals.

Short Term (2-5 years)

- Increase emergency preparedness and response capabilities
- Strengthen community unity
- Support commercial recovery and long-term viability
- Repair and improve resiliency of NYCHA properties
- Improve resiliency of low-lying housing and businesses
- Improve transportation connections
- Provide and protect dedicated community space and recreation resources and organizations
- Embrace green infrastructure

Long term (5-10 years)

- Provide coastal flood protection
- Increase economic and social integration and equality
- Expand and protect Red Hook's mix of residential, commercial, industrial, and maritime uses
- Create sustainable water management systems (e.g., sewer and drainage)
- Address utility and energy redundancy needs

Vision statement

The following vision statement summarizes the key priorities and goals of the Red Hook Planning Committee and public in attendance at NYRCR Program events:

“Empowered by the spirit of unity that helped the Red Hook community survive Hurricane/Superstorm Sandy, our vision for a **resilient and thriving** future is to work as a holistic community to **strengthen the historic waterfront** Red Hook Peninsula by minimizing differences and maximizing cooperation among all who live and work here. **Mindful of the growing climate-related risks** to our beloved community and the immediate need for improved emergency preparedness measures, our actions will serve to help to develop measures that will protect our neighborhood from flood inundation, **increase the safety of our citizens**, and move towards a **resilient community**. We are committed to **maintaining and expanding affordable housing** and **increased economic activity** with an emphasis on **local job development**, recognizing the importance of their interdependence. Our re-building efforts towards a resilient and sustainable community are focused on a sincere triple bottom line **integration of environment, economy, and community**, which will require substantial improvement to our **long-neglected infrastructure** including sewers, transportation, communications, power and energy provision, and education.”



Source: Carolina Salguero

F. Relationship to regional plans

Regional perspectives

The Planning Committee developed its NYRCR Plan while considering Red Hook’s relationship to regional systems and issues. Red Hook’s relationship to the region informed much of the Committee’s discussion. Many of these regional issues are being addressed by other entities and therefore are not the focus of the NYRCR Plan, but they are nonetheless important to resiliency and Red Hook’s long-term welfare.

Red Hook’s significance within the regional maritime industry is an important feature of the Community. Red Hook’s Erie Basin and PANYNJ facilities provide important economic, industrial and transportation services. The Red Hook Container Terminal, located between Atlantic Basin and Atlantic Avenue, is one of five container handling facilities under the PANYNJ in the region and the only such facility in Brooklyn. It serves as a critical point in the metropolitan distribution chain. The Brooklyn Cruise Terminal is located at Atlantic Basin and is one of only two cruise terminals in New York City and hosts international and national cruise lines.

With so much of its waterfront devoted to an active maritime economy and serving a critical role in regional systems, many

communities stand to benefit from initiatives by the PANYNJ and other regional agencies seeking to protect their port and shipping facilities. Maximizing the full potential of Atlantic Basin could benefit regional systems as well as Red Hook. To that end, the Red Hook Planning Committee has emphasized the importance of improving communication and coordination with PANYNJ in the future. Relevant to this is the pilot study by PANYNJ analyzing the feasibility of using clean dredge from the Bay and Buttermilk Channel region for on-land uses.

A number of regionally significant transportation and industrial assets are located in Red Hook. The Hugh L. Carey Tunnel (formerly Brooklyn-Battery Tunnel) is a critical connector between Brooklyn and Manhattan

that is vulnerable to flooding. Though flooding during Superstorm Sandy came from the Manhattan side of the tunnel, increasing the resiliency of the tunnel entrance is critical to Red Hook and the larger metro region. Red Hook’s many waterfront industrial and manufacturing businesses also provide important services to the region. Red Hook is connected to its adjacent Brooklyn neighbors via unique water features and recreational amenities. The Gowanus Canal Superfund site—which is set to undergo remediation under an Environmental Protection Agency (EPA) mandate—presents challenges to the safety and resiliency of Red Hook and surrounding areas. Red Hook’s position along the Brooklyn Greenway route connects Red Hook to the other waterfront neighborhoods of Brooklyn.

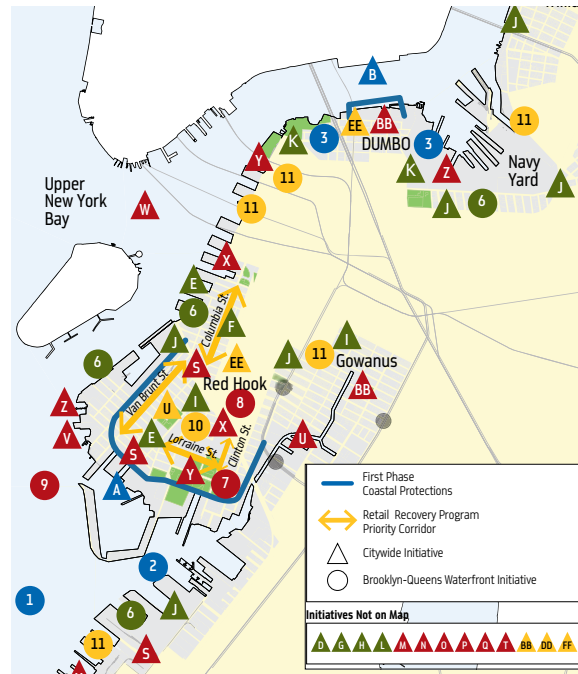


Red Hook is adjacent and connected to critical regional infrastructure systems such as the Hugh L. Carey Tunnel (formerly Brooklyn-Battery). Source: Flickr user J. Bay under Creative Commons

City, State, and Federal plans and initiatives

In order to avoid duplication of plans and to identify how NYRCR may best fill existing gaps, the Committee reviewed past and ongoing plans, studies, and projects at the City, State, and national level. These initiatives are many and a sampling of the most critical are outlined in the subsequent section.

“A Stronger, More Resilient New York” (the “SIRR Report”), is a comprehensive guide for resiliency for the City of New York. The Report, released in June 2013 by former New York City Mayor Michael Bloomberg, documents what transpired prior to, during, and after Superstorm Sandy, what is the likely risk as the climate changes, and what New York City can do to rebuild post-Sandy, ensuring resiliency into the future.¹² The plan contains actionable recommendations both for rebuilding communities in the city affected by the storm and improving resiliency for systems, including coastal protection, buildings, insurance, utilities, liquid fuels, healthcare, transportation, parks, water and wastewater, and other critical networks. Specific initiatives in Red Hook include but are not limited to a call for the Metropolitan Transportation Authority (MTA) to explore Red Hook-Lower Manhattan



A number of SIRR Report initiatives for Red Hook align with needs identified in the NYRCR Plan.
Source: SIRR Report

bus connections, a call to implement planned upgrades to vulnerable City-owned, industrial properties, and a recommendation for PANYNJ to continue to study innovative coastal protection measures using clean dredge material. A number of these initiatives are already being implemented.

Funding for an integrated flood protection system in Red Hook

In January 2014, Governor Andrew M. Cuomo joined with Vice President Joseph Biden to announce New York State's \$17 billion strategy, "Reimagining New York for a New Reality," that includes a \$200 million partnership between the State and the City of New York to develop a comprehensive flood management system—the first of its kind in the nation—to protect the low-lying neighborhood of Red Hook. The details of the project are to be determined, but will potentially encompass 370 acres of land and may feature a combination of elements, including a natural greenway, deployable flood walls, elevated streets, and drainage pumps. This project will play an important role in the region and may tie into the Brooklyn Waterfront Greenway route.

The Red Hook Planning Committee applauds this effort and has highlighted this as a featured project in the NYRCR Plan. The Planning Committee and Red Hook Community drafted principles to guide development of this project in a manner that aligns with community goals.

This concept was proposed in the SIRR Report as Citywide Initiative #23 “Install integrated flood protection system in Red Hook.” The announcement of funding is an important step from resiliency planning to implementation.

Flood Maps and Flood Risk

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs)

The Federal Emergency Management Agency (FEMA) describes its assessment of flood risk through flood maps referred to as Flood Insurance Rate Maps (FIRMs). These maps are used by the National Flood Insurance Program (NFIP) to set flood insurance rates. Before Superstorm Sandy, FEMA had begun a coastal flood study to update FIRMs for portions of New York and New Jersey, using improved methods and data to better reflect coastal flood risk. When Superstorm Sandy hit New York City, the FIRMs in use were based on information from 1983 and inundation extended well beyond what these maps estimated would be the 100-year floodplain.

After Superstorm Sandy, FEMA first released Advisory Base Flood Elevation (ABFE) maps based on the partially completed flood study for certain communities, which were designed to help in rebuilding and recovery efforts. In December 2013, FEMA released preliminary FIRMs for New York City. The final updated FIRMs are anticipated to be released in 2015. These final FIRMs will guide new Flood Insurance rates for homeowners and businesses in the floodplain. FEMA's flood maps do not take into account future conditions and thus do not factor in potential sea level rise.

National Flood Insurance Program (NFIP)

FEMA developed the NFIP in the 1960s to provide homeowners with flood insurance, which was not readily available in the private market.^[i] Through NFIP, property owners in participating communities are able to buy subsidized, government-backed insurance to protect against flood losses. The Biggert-Waters Act of 2012 proposed the controversial repeal of subsidies and other restructuring in order to make the program more financially sound. Coupled with the previously mentioned FIRM map adjustments, the repeal would result in substantial premium increases for many policyholders. In a move to bring flood insurance rate relief to coastal communities in the wake of Superstorm Sandy, in March 2014, Congress passed and President Obama signed the Homeowner Flood Insurance Affordability Act into law. The law caps average annual flood insurance premium increases at 15%- 18%, and allows subsidies for insurance rates that are based on revised flood maps. It also designates a flood insurance advocate to educate homeowners and policy holders on mitigation measures that can help reduce flood insurance rates, and recognizes among these measures methods for reducing flood risk that provide alternatives to building elevation for residential buildings such as attached homes whose structures cannot be elevated.

Through the NYC Recovery Program the City launched several initiatives aimed at helping residents across the five boroughs recover from the damage caused by Superstorm Sandy. The City's Build it Back program seeks to assist homeowners, landlords, and tenants, whose homes were damaged by Superstorm Sandy. The NYC Recovery Program also offers business loans and grants to small business owners whose spaces were damaged by Superstorm Sandy. Most of these recovery programs support resiliency investments and will help improve homes and businesses in the communities in Red Hook. More information on the NYC Recovery program can be found here: <http://www.nyc.gov/html/recovery/>.

The City's Building Resiliency Task Force identified 33 recommendations to the City Council. Many of these recommendations are still in various stages of review by the Council, but 16 initiatives have been passed. In addition, the Department of City Planning's Flood Resilience Zoning Text Amendment was approved by the City Council on October 9th. This amendment will apply to construction in the 100-year floodplain and modify zoning to remove barriers to flood-resistant construction (e.g., increasing allowable building heights to enable the elevation of groundfloor uses and mechanical systems). The report and latest updates on implementation can be found on the SIRR website: <http://www.nyc.gov/html/sirr/>.

Designing for Flood Risk identifies key principles to guide the design of new buildings in flood zones so that construction will be more resilient to the effects of climate change and coastal flood events. Recognizing the distinct character and needs of higher-density urban environments, the report provides recommendations for how regulations and individual project design can incorporate these principles. The study informed the Department of City Planning's Flood Resilience Zoning text amendment adopted by City Council in 2013.

The recently announced NYCEDC Business Resiliency Investment Program (BRIP) aims to help meet the resiliency needs of small businesses. BRIP is a \$110 million CDBG-DR-funded program that will provide funds to both business tenants and building owners to make improvements that enhance resiliency to severe weather-related events. BRIP will focus on funding a portion of the incremental costs of resiliency measures through grants that require capital match by recipients; the program will focus on funding resiliency improvements and not repairs.

Through the U.S. Department of Housing and Urban Development (HUD) Rebuild by Design (RBD) competition, a team of design professionals is analyzing the potential for different organizational structures and incentive tools to help small businesses

implement resiliency upgrades in Red Hook and other communities. Research findings and public engagement for the RBD process has been closely coordinated with the NYRCR process.

The analysis of transportation issues considered a number of plans and studies. For instance, the New York City Economic Development Corporation's (NYCEDC) 2010 Citywide Comprehensive Ferry Study discussed the ways in which enhanced ferry service in Red Hook could provide multiple local and regional benefits, including increased access to a variety of destinations in Red Hook, as well as substantial reductions in commuting time to Manhattan, which could further increase the neighborhood's attractiveness. The updated 2013 Citywide Comprehensive Ferry Study (a precursor to a Final Report anticipated in Spring 2014) revisits the potential for enhanced ferry service in Red Hook, including consideration of a new landing site at Valentino Pier as well as a site at the foot of Van Brunt Street. The New York City Department of City Planning's (NYC DCP) Red Hook Transportation Study is identifying ways to improve access, mobility, and safety for Red Hook, as well as enhance connectivity between Red Hook and other neighborhoods and is relevant to discussion of transportation connectivity and redundancy in Red Hook.

Brooklyn Greenway Initiative (BGI) in partnership with Regional Plan Association (RPA) has been selecting, designing and implementing the Brooklyn Waterfront Greenway route—a 14-mile recreational trail along the Brooklyn waterfront that runs through Red Hook. In addition to developing a valuable regional recreation amenity, the initiative has developed preliminary stormwater infrastructure design guidelines. These guidelines can promote the incorporation of green infrastructure in the ongoing development of the Brooklyn Greenway, thereby helping to address the chronic drainage problems the NYRCR Committee has discussed in depth. These guidelines may also inform the development of the aforementioned integrated flood protection system in Red Hook.

The future of the Red Hook Community will also be guided by the New York City Waterfront Revitalization Program (WRP), which serves as the City's coastal zone management tool and outlines the City's policies for development and use of the waterfront. In October 2013, the New York City Council approved revisions to the WRP that were proposed by NYC DCP to advance the goals of the City's Comprehensive Waterfront Plan, Vision 2020. The adopted revisions include modifications and additions to the WRP to "improve projects within the coastal zone through promoting climate resilient designs, increasing public access to the waterfront when appropriate and achievable, and improving interagency



Building the Brooklyn Waterfront Greenway: recent and planned projects to complete the Brooklyn Waterfront Greenway in Red Hook. Source: Brooklyn Greenway Initiative

coordination to foster a clear, predictable development process.” One noteworthy revision is the designation of Priority Marine Activity Zones (PMAZs), one of which runs along the Red Hook waterfront, to “promote the maintenance of necessary shoreline infrastructure for waterborne transportation such as piers for ferry landings.”¹³

Local plans and initiatives

Many impressive efforts are underway in Red Hook to address resiliency and wider economic and community development needs. Seeking synergies and avoiding duplication with local efforts was a priority for the Red Hook Planning Committee.

Emergency preparedness planning and community capacity building plans and initiatives are underway by a number of Red Hook CBOs. Red Hook’s response and recovery efforts were documented in the Red Hook Initiative’s 2013 Summary Report “A Community Response to Hurricane Sandy” which will be supplemented with additional analysis going forward. These efforts to document critical lessons from Sandy provided helpful background to the NYRCR Plan. Additionally, other ongoing initiatives include the Red Hook Coalition’s emergency preparedness planning efforts—the Long Term Community Preparedness Recovery Planning Process, working on developing a communications network, and the Emergency

Response Team Program. The Red Hook Coalition also is undertaking relevant emergency preparedness work through continued expansion of the Red Hook WiFi network, which provided communications support during Sandy and can contribute to resiliency in the future.

A number of housing resiliency programs and studies are underway or have been completed in Red Hook. The Fifth Avenue Committee is managing a neighborhood-wide housing assessment which will provide detailed information on the recovery and resiliency needs of Red Hook housing stock. The organization also helped run the Sandy Design Help Desk, a weekend-long technical assistance workshop for building owners that has highlighted the complicated resiliency issues building owners must navigate.

Local efforts supplemented City and regional economic development initiatives. For example, ReStore Red Hook was formed in the wake of Superstorm Sandy to provide needed financial assistance to small businesses in Red Hook. In cooperation with the Fund for the City of New York, the program has raised close to \$500,000 for businesses. In December 2012 the program was able to award grants of \$4,000 each to approximately 50 local businesses.

Design competitions and academic programs exploring resiliency issues in Red Hook have also contributed valuable information to the NYRCR process. Through Pratt Institute's Recovery, Adaptation, Mitigation, and Program (RAMP) Graduate Studio, students analyzed conditions, challenges, and solutions to resiliency needs in Red Hook. One graduate student's work considered the feasibility of a job training program in Red Hook modeled after the Rotterdam, Netherlands Rotterdamsche Droogdok Maatschappij (RDM) program. The RDM program provides low and high tech workforce training in a broad range of manufacturing industries and includes resiliency and energy efficiency curricula. Another student analyzed the sewer system in Red Hook proposing a waste to energy system that would allow residents to profit from waste. These innovative ideas fed into Planning Committee discussions. The AIGA Design/Relief effort is analyzing resiliency and recovery in Red Hook and is looking closely at the need for communication hubs throughout the neighborhood. This design idea ties in with the need for resilient communication and better relief coordination that residents identified and the NYRCR process has coordinated with these ideas.

Overall, key takeaways from review of existing regional and local plans, studies, and projects that specifically relate to Red Hook include:

- Red Hook's transportation needs have been studied in several past reports and ongoing initiatives, including the feasibility of expanded ferry, new streetcar service, and direct bus service from Red Hook to Manhattan.
- Local community organizations have documented the response of residents and organizations in the wake of Superstorm Sandy, and groups have begun planning and visioning processes aimed at galvanizing a more unified and active community.
- There is a need for better understanding of local electrical and water management systems (e.g., sewer/drainage) and their weaknesses.
- While many helpful resources and studies exist, a central clearinghouse to gather, organize, and disseminate this information is needed.



Red Hook Initiative and other CBOs are undertaking resiliency and preparedness work in Red Hook.
Source: Red Hook Initiative

Recovery Support Functions

Throughout the NYRCR Plan, six Recovery Support Functions are used to guide the identification of issues, assist in categorizing assets and assessing risk, frame needs and opportunities, and organize resiliency strategies. These functions are derived from FEMA's National Disaster Recovery Framework (NDRF) developed by President Barack Obama in 2011 and will help coordinate this plan with state and federal programs. These recovery support functions are:



Community Planning and Capacity Building: This function addresses a community's ability to implement immediate storm recovery activities and organize long-term resiliency plans. Formal and informal community networks, dedicated emergency education and planning efforts, and experience recovering from past emergency events are characteristics that may enhance this function.



Health and Social Services: This function addresses the ability of public health, health-care facilities, and essential social services to be restored after a disruptive event.



Economic Development: This function addresses the ability for economic and business activities to return to normal. Developing new economic opportunities that result in a sustainable and economically strong community is a component of this function.



Housing: The resiliency of a community's housing stock is addressed by this function—including both physical resiliency and financial health and resources.



Infrastructure Systems: This function relates to local and regional transportation, water management, utility systems, and the ability of these to withstand and recover from disruptive events. The economic development and job creation capacity of these systems are also critical to this function.



Natural and Cultural Resources: Natural systems can play an important role in resiliency and recovery. The ability of natural features to withstand disruptive events as well as their ability to mitigate damage are addressed by this function. Cultural resources can play an important role in recovery through provision of spaces and forums for recovery.

II. Assessment of risk and needs

A. Description of community assets & assessment of risk

As a critical early step in the NY Rising Community Reconstruction (NYRCR) Program planning process, the NYRCR Planning Committee (Committee) undertook an inventory of assets and an assessment of risk to those assets. The asset inventory identifies and describes Red Hook's key assets, emphasizing those assets that provide recovery support functions. The Risk assessment evaluates the risk to these assets and describes the potential storm and flood impacts to community functions. Together with the Community vision and critical issues, the asset inventory and risk assessment were used to shape the definition of needs and opportunities, inform the development of projects, and evaluate the potential risk reduction and other benefits of proposed projects.

Assets include a variety of places and resources within a neighborhood that are valued by the NYRCR Community. They may facilitate economic and social activities, or may refer to critical infrastructure required to support those activities. Assets may also be part of the built or natural environment. Some assets are best described as systems. These are assets which may fall within or outside the Community whose impairment would affect community assets or activities: for example, a wastewater system is made up of multiple components and much of

the network may exist outside the Community itself, but the function of all these parts is critical to regular Community life.

Assets were identified through a combination of research, data gathering, and stakeholder engagement. The list of assets described drew from extensive public outreach, including Public Engagement Events and outreach through an online interactive community asset map (<http://redhook.nyrisingmap.org>). Both the online and the physical maps provided at Public Engagement Events allowed Community members to comment on assets and highlight associated needs and issues. Events also allowed Community members to add additional or corrected information about assets and to add missing assets.

A major objective of the asset inventory is to assist in evaluating risk from future storms and flooding. In order to facilitate this evaluation, New York State Department of State (NYS DOS) has developed and mapped three assessment areas (risk areas): Extreme, High, and Moderate, described in the adjacent call-out box. The risk area was identified for each asset.

What do the risk areas mean?

NYS DOS, with the assistance of the National Oceanic and Atmospheric Administration (NOAA), mapped geographic areas representing the likelihood for coastal flooding. They identified three risk areas:

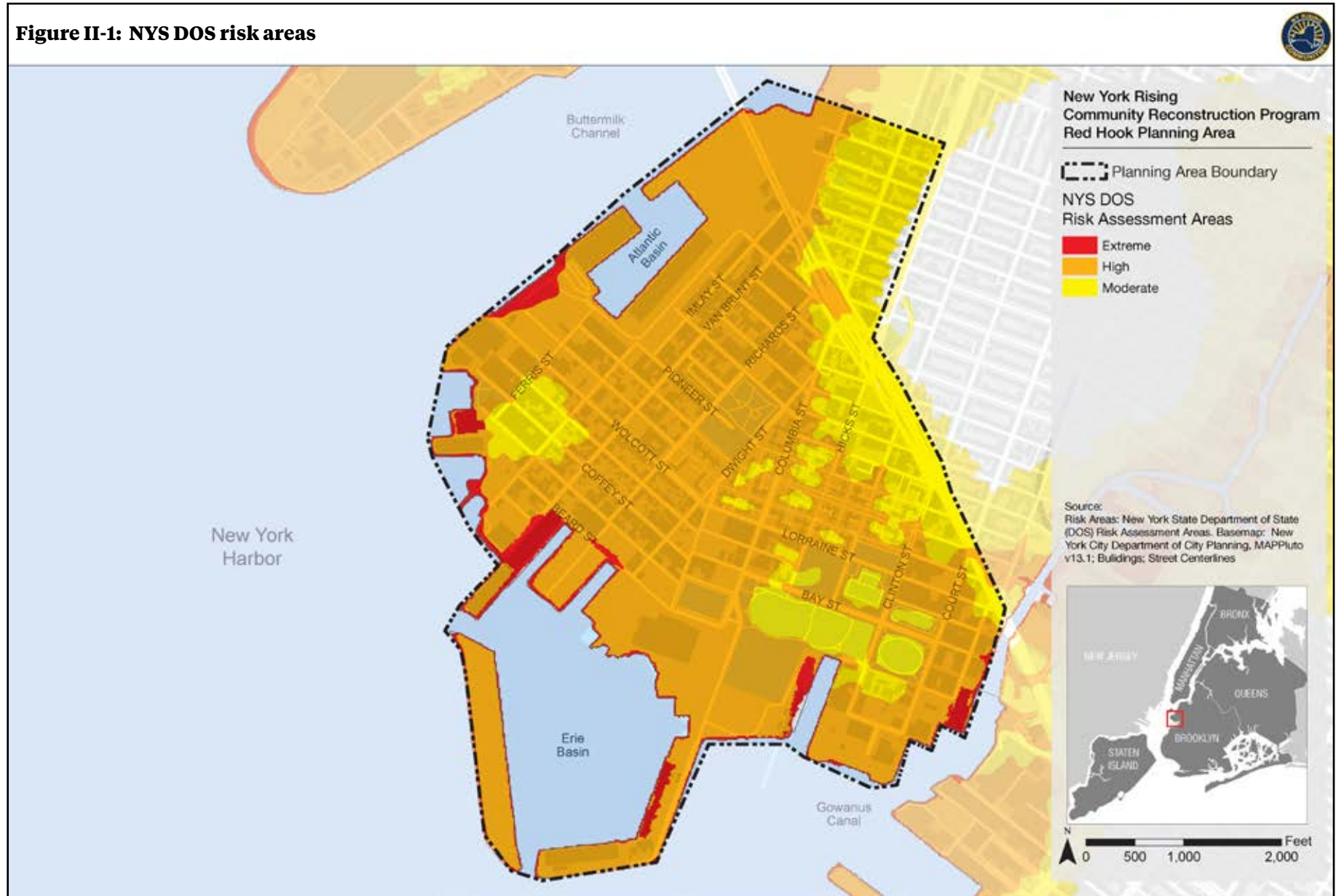
Extreme: Areas currently at risk of frequent inundation and vulnerable to erosion and wave action over three feet (FEMA V zone), subject to shallow coastal flooding (within the National Weather Service's shallow coastal flooding advisory threshold), or likely to be inundated in the future due to sea level rise (assumes three feet).

High: Areas outside the extreme risk area that are currently at risk of infrequent inundation (FEMA A zone, meaning there is a 1% annual chance of flooding) or at future risk of shallow coastal flooding with sea level rise (assumes three feet).

Moderate: Areas outside the extreme and high risk areas but currently at moderate risk of inundation from infrequent events (FEMA shaded X zone, meaning there is a 0.2% annual chance of flooding) or at risk of being in the 100 year floodplain with sea level rise (assumes of three feet), and any areas expected to be inundated by a category three hurricane.

A more detailed description of the NYS DOS Risk Assessment Area Mapping Methodology can be found on the NYRCR website, as can a link to an online viewer for the risk assessment area maps, at <http://stormrecovery.ny.gov/community-reconstruction-program>.

Figure II-1: NYS DOS risk areas



Description of community assets

The assets identified and described in this section were organized by NYRCR Asset Class. The Asset Classes are similar to the six Recovery Support Functions, but differ slightly in order to facilitate use of the NYS DOS risk assessment tool (described in the following section) as the tool is designed to evaluate risk to physical assets but does not evaluate community- and capacity-building. For the purpose of the inventory, assets were categorized by what was understood to be their primary function. However, it is worth noting that in many cases, assets serve multiple functions. For instance, parks and community farms (categorized as natural and cultural resources) served as distribution sites for supplies and information following Superstorm Sandy and were critical to social service and community capacity building functions. Similarly, some assets, such as the Brooklyn Waterfront Greenway route, are recreational resources and also provide infrastructure services (transportation and stormwater management), particularly in a recovery situation.



Health & social services assets

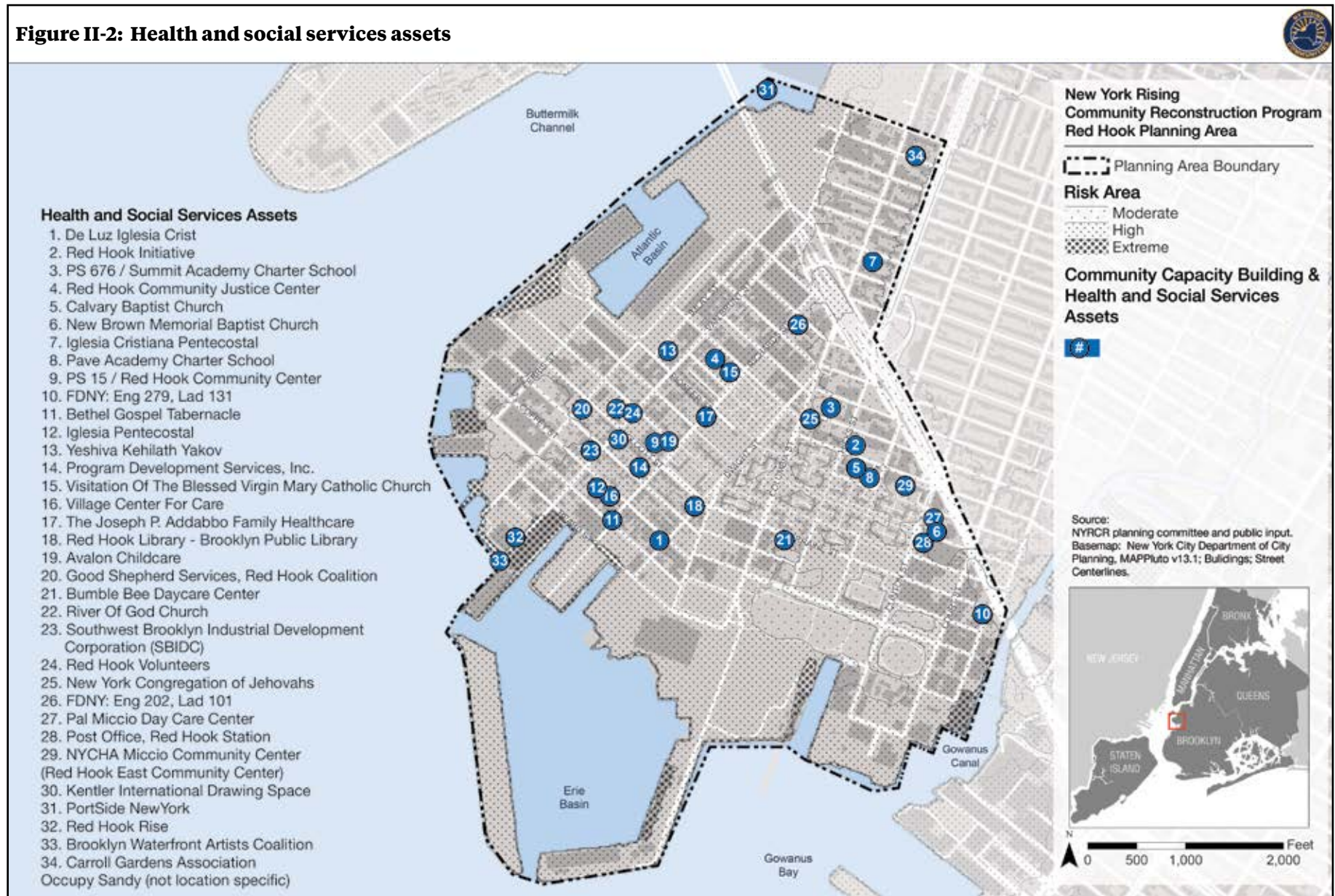
Numerous health and social service assets played a key role in providing community- and capacity-building as well as health and social services during the post-Sandy recovery and will be critical to any future recovery efforts. These assets include schools, healthcare facilities, daycare and senior care facilities, government and administrative services, public works facilities, emergency operations/response, cultural or religious establishments, community centers, libraries, and nonprofit/community organizations.

Nonprofit/community organizations and religious establishments in particular provided essential shelter, food, supplies, information and medical assistance to local residents and businesses in the aftermath of Sandy. Organizations emphasized by the Committee included but were not limited to Occupy Sandy, PortSide New York, the Red Hook Coalition, the Red Hook Initiative, Red Hook Volunteers, Southwest Brooklyn Industrial Development Corporation, Visitation of the Blessed Virgin Mary Church (Visitation Church), and Calvary Baptist Church. While most of these organizations have physical headquarters, it was the actions and services they provided throughout the Community at multiple locations, rather than services provided at their headquarters, that were critical and will continue to be relied on in future disasters. Moreover, while

many of these assets might also be considered cultural assets, in the context of resiliency, their role in providing key community services during and after an emergency was emphasized. Other health and social service assets the Committee identified as playing an important role in the recovery effort included the Miccio Community Center, P.S. 15, and the Red Hook Library. These locations served as community gathering places in the wake of Sandy. The two New York City Fire Department (FDNY) stations in Red Hook—at 252 Lorraine Street and 29 Richards Street—provided vital emergency response services for the Community during and following the storm. Red Hook has limited healthcare facilities within the Planning Area. The Joseph P. Addabbo Family Healthcare Clinic is the only medical facility in Red Hook, providing primary care and pharmaceutical services to residents. These various assets are spread across the community, with many in the high risk zone. A number of these assets are located in or close to the moderate risk zone and this lower hazard level should be noted.

While located outside the Planning Area, there are three emergency evacuation centers that are near the Red Hook neighborhood: New York City Technical College (300 Jay Street), Brooklyn Tech High School (29 Fort Greene Place) and John Jay High School (237 Seventh Avenue).

Figure II-2: Health and social services assets





Economic assets

Economic assets, including industrial, retail and other commercial uses, are located throughout the Red Hook Planning Area.

Commercial and industrial property comprises 44% of the Community's land area and 40% of the Community's floor area. Consistent with Red Hook's maritime history, many of its economic assets are concentrated along the waterfront, which is home to a number of large-scale maritime and industrial uses. These include but are not limited to the southern portion of the Red Hook Container Terminal on Pier 10, the Brooklyn Cruise Terminal on Pier 12, the Erie Basin Barge Port and the Gowanus Bay Terminal. Other notable economic assets on or near the waterfront include IKEA, Fairway Market, historic warehouses and other mixed-use industrial properties accommodating artists and food production, and storage and distribution uses.

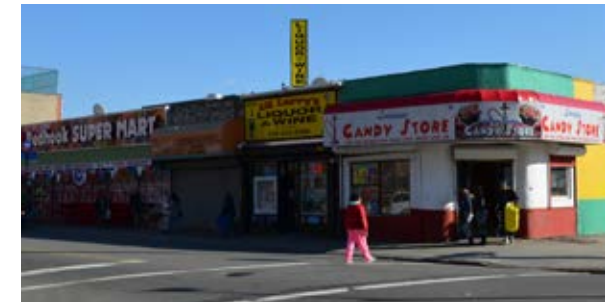
The current nature of Red Hook's Industrial assets is highly varied. Manufacturers range from heavier industries such as precision machining or welding supplies to smaller, more artisanal manufacturers and industrial arts. Food processing was noted as a significant industry including both large (seafood processing, etc.) and smaller enterprises (bakeries, chocolate manufacturers, smoked meat production and multiple distilleries among others). A number of these producers are well known and draw

customers and coverage Citywide (e.g., Steve's Key Lime Pies) and even nationally (e.g., Stumptown Coffee Roasters). For the purpose of assessing risk, these assets were not individually identified, but rather addressed as a group.

Commercial and mixed-use corridors are critical assets that serve the Community and regional visitors. The Van Brunt Street and Lorraine Street corridors as well as a stretch of Clinton Street adjacent to Red Hook Houses were among those highlighted by the Committee as key assets. These corridors are comprised of small- and larger-scale businesses that include dry goods retailers, grocery/food suppliers, restaurants, bars and other services. Businesses along these corridors suffered in the wake of Sandy, with key retail corridors and adjacent side streets experiencing significant flooding. While the majority of businesses along it are located outside the Planning Area, and it was not impacted by Sandy, the north end of Columbia Street was also identified by some Community members as an economic asset.

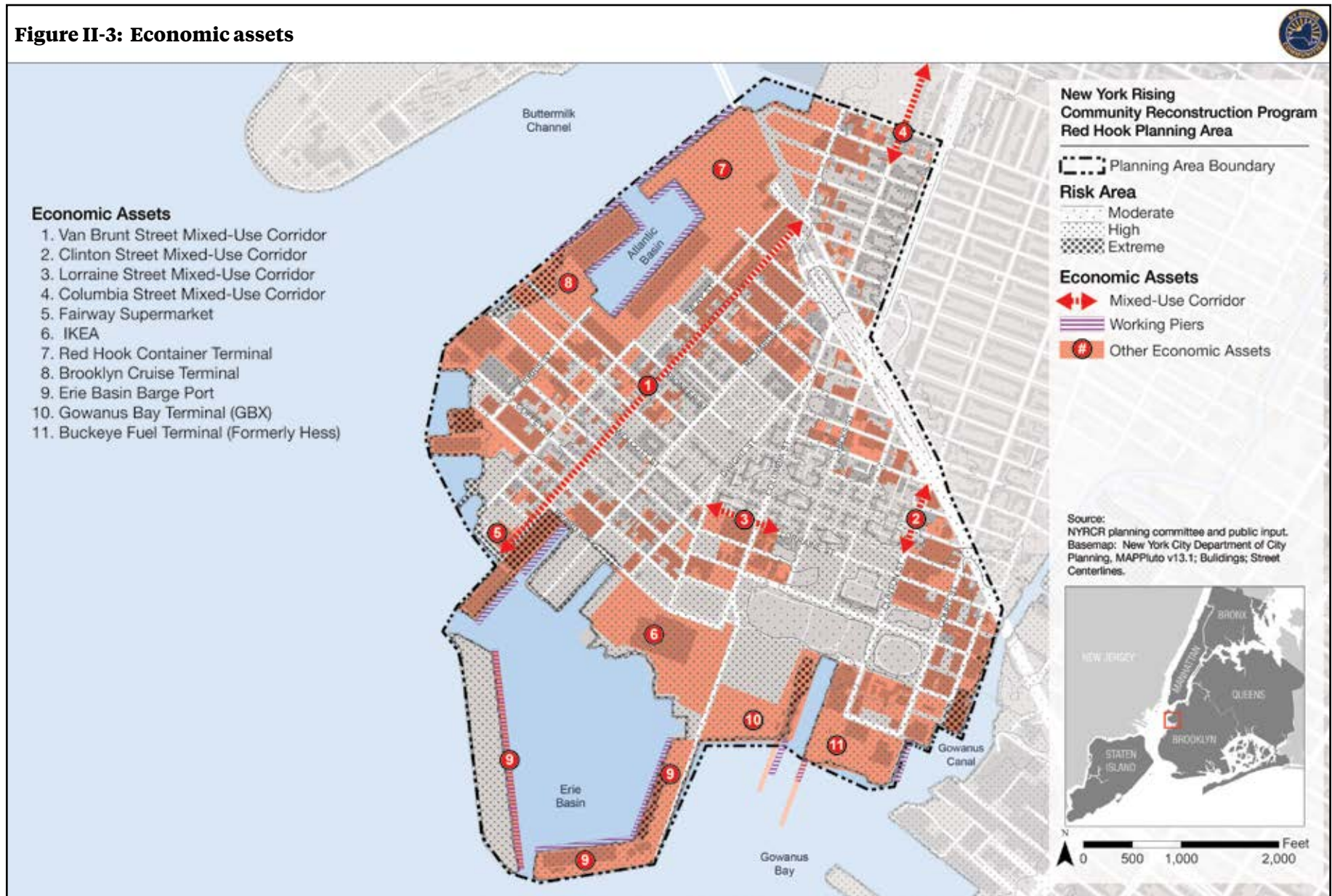
While Red Hook is home to major employers such as Fairway and IKEA, most of the neighborhood's businesses are small businesses. Micro-businesses—traditionally defined as having five or fewer employees—are estimated to comprise approximately 67% of Red

Hook businesses.¹ These businesses are located throughout the neighborhood both in formal and informal facilities.



Diverse economic corridors include Lorraine Street corridor (top), and Van Brunt Street (bottom)

Figure II-3: Economic assets





Housing assets

The Red Hook Planning Area includes a variety of housing conditions and building types.

Single- and multi-family residences, mixed-use housing, supportive housing and affordable housing are all found in Red Hook. 30% of the Community's buildings are residential with an additional 5% being mixed-use (residential and commercial).² Housing is provided in a variety of building types including: townhomes, apartments over ground-floor retail, tenements of four or five stories, and high-density apartment buildings, along with live-work and residential space within informally converted manufacturing buildings.

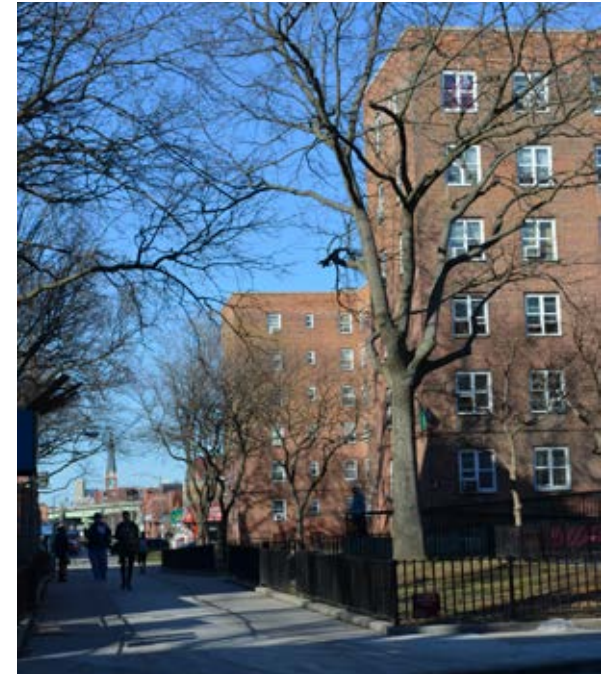
More than half of the population living in the Red Hook Planning Area lives in the New York Housing City Housing Authority (NYCHA) Red Hook East and Red Hook West housing developments.

Located on more than 33 acres east of Dwight Street between Lorraine Street and West 9th Street, Red Hook East includes 27 buildings with 2,873 housing approximately 6,500 residents. Red Hook West is located on approximately six acres between Dwight Street and Richards Street and includes three buildings with 345 apartments that house more than 800 residents.³

Several housing assets in the Red Hook Planning Area serve socially vulnerable populations, comprised of people with

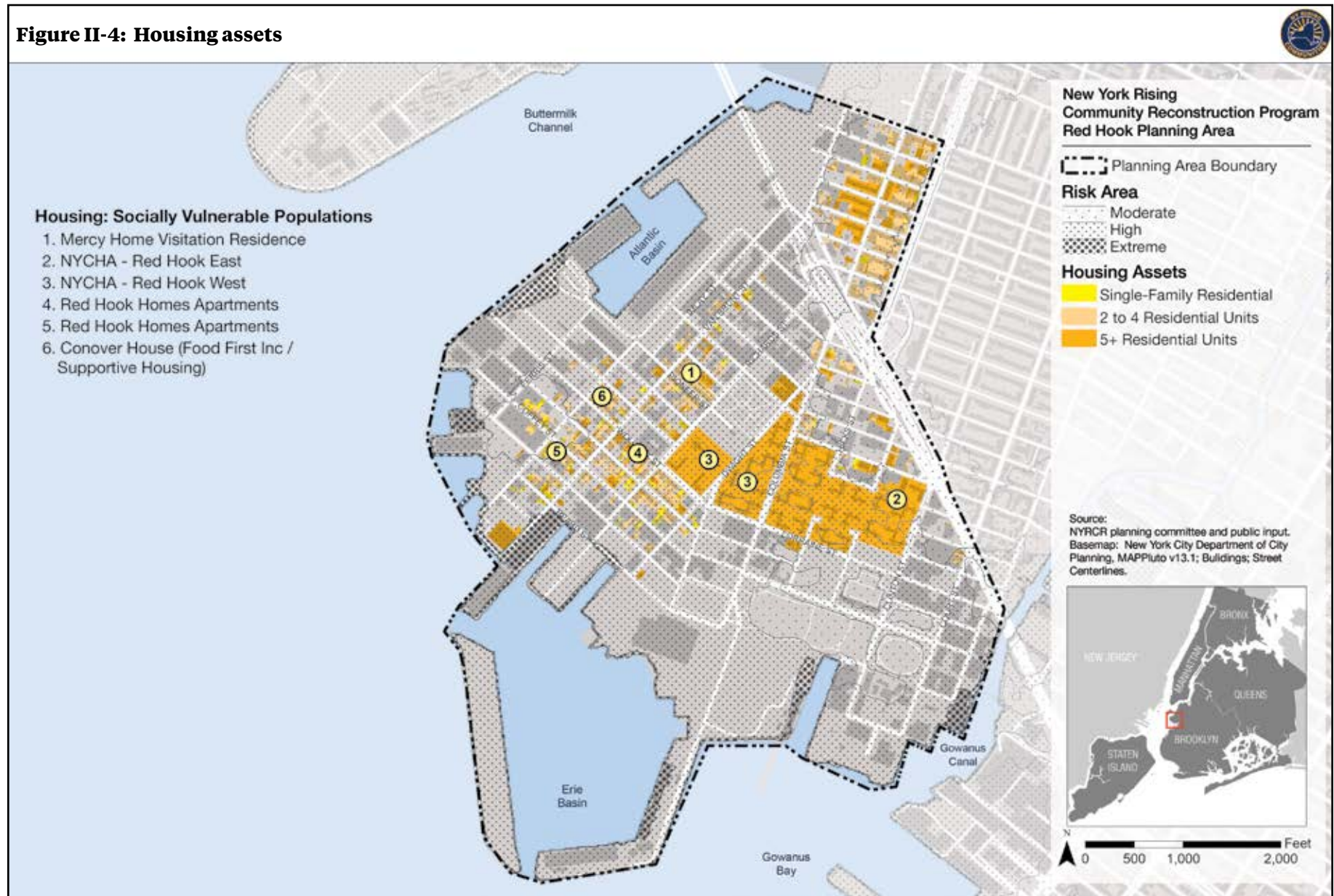
disabilities, low- and very low-income populations, the elderly, young children, homeless and people at risk of becoming homeless. Vulnerable populations are defined here as those individuals who have limited mobility or are economically disadvantaged and therefore have constrained resources or flexibility to address housing challenges that can arise in an emergency. Vulnerable populations are concentrated in the NYCHA housing developments of Red Hook East and Red Hook West, Mercy Home Visitation Residence, and the Conover House. There is also Section 8 housing located within the neighborhood. Beyond those sites listed here, there are many vulnerable individuals living throughout the neighborhood in private residences.

For the purpose of assessing risk, housing assets were grouped based on the social and physical characteristics of the housing as well as their location relative to the NYS DOS risk areas.



Almost half of the residents in Red Hook live in the Red Hook Houses (top). Many residents live in attached row-houses (below).

Figure II-4: Housing assets





Infrastructure systems assets

Infrastructure systems were given high attention and priority in the discussion of assets. Red Hook's critical infrastructure systems—including sewer and stormwater, electrical grid, gas lines, and transportation systems—were all heavily impacted during Sandy. The need to address their vulnerabilities, or at least the impacts on community recovery support functions dependent on these systems, was identified as a critical issue.

Infrastructure to manage stormwater and wastewater comprises a critical asset within Red Hook. The neighborhood is served by a combined sanitary and storm sewer system — which collects both sewage and stormwater in the same pipes. In Red Hook, this combined sewer and stormwater flow to a low point in the system, from which it travels under pressure to the Red Hook Wastewater Treatment Plant (WWTP). For the vast majority of the Planning Area, water is pumped to the WWTP via the Red Hook Interceptor sewer (under Van Brunt Street) from the Van Brunt Pump Station located at the intersection of Van Brunt and Reed Street. The damage to the pump station caused by Sandy has been repaired, returning the pump station to a functional status; however, resiliency upgrades have yet to be made to protect the asset from future flooding.

While details describing the condition, capacity, extent and function of the sanitary and sewer system were not obtained as part of this planning process, Community members expressed significant concerns regarding its capacity and condition. These concerns were based on observations of regular backup events and flooding as well as severe drainage issues following Sandy. In addition to regular ponding of stormwater, flooding of basements, and sewer back-up, the Community reports frequent combined sewer overflow events. These events occur during and following heavy rain events when the volume of water in the system temporarily exceeds the capacity of the WWTP and untreated sewage and stormwater are discharged directly to surrounding water bodies through combined sewer outfalls. In some waterfront areas, storm sewers discharge directly to the harbor and do not contribute to the combined sewer system.

Electrical service to the area is provided by Con Edison through a mix of above-ground and overhead lines. While the system was not studied in depth as part of the planning process, it is generally understood that much of the system's infrastructure, as well as the infrastructure within many buildings, is quite old. In addition, while many residents and businesses have made repairs since Sandy, the electrical

systems in many buildings and facilities likely still sustain damage impacts from Sandy as repairs to insulation and wiring are costly and require interruptions in service that many homeowners and businesses cannot afford.

Heat and hot water in homes and businesses are largely powered via natural gas. As the impact to the gas supply systems also hindered recovery functions after Sandy, this system was also noted as a critical asset. Natural gas is supplied to the neighborhood by Brooklyn Union Gas.

Transportation and particularly waterborne transportation, was identified by the Community as critical to recovery. Red Hook's transportation assets were largely defined by the deficiencies in service to the neighborhood. The Hugh L. Carey Tunnel (formerly the Brooklyn-Battery Tunnel), whose eastern end is located within the Red Hook Planning Area, is a connector between Brooklyn and Lower Manhattan for the region. This route is not identified as a particularly well-used connection by the Red Hook Community itself. In Red Hook, the Tunnel and the Brooklyn Queens Expressway are more significant as a barrier to pedestrian, bike, and vehicular connections between Red Hook and surrounding neighborhoods on surface streets.

Figure II-5: Infrastructure system & natural and cultural assets





Red Hook is served by a combined sewer system, with a number of Combined Sewer Outfalls (CSOs)



The B61 is one of two bus routes that serve Red Hook.



Working piers comprise a significant portion of Red Hook's Waterfront

Public transit service is limited. The typical commute from Red Hook to Downtown Brooklyn and Lower Manhattan via public transit is around 25 minutes and 40 minutes, respectively. There are two bus routes—the B57 and B61—that serve Red Hook; the B57 provides service to Carroll Gardens, Downtown Brooklyn, Williamsburg, and Maspeth, and Queens, and the B61 provides service to Downtown Brooklyn, Park Slope, and Windsor Terrace. There is no direct bus service to Manhattan. The closest subway station—Smith and Ninth Streets, which services the F and G trains—is outside of the neighborhood itself and requires an approximately 10-20-minute walk or bus ride.

As a peninsula with many working piers, there is high potential for waterborne transportation to serve Red Hook, but today this service is lacking. Currently, there is ferry service between

IKEA and Pier 11/Wall Street in Lower Manhattan which is limited to afternoon service only and does not effectively serve commuters. During the summer following Sandy, temporary service between Red Hook and Lower Manhattan operated from a stop at the foot of Van Brunt Street (behind Fairway Market), but this service has been discontinued.

A large portion of Red Hook's waterfront is comprised of working piers which are critical to a variety of economic and infrastructural for the neighborhood. The Port Authority of New York and New Jersey (PANYNJ) owns two facilities associated with the operation and maintenance of the Red Hook Container Terminal and Brooklyn Cruise Terminal at Atlantic Basin. The marine infrastructure maintained by PANYNJ supports the activity of both of these facilities which are significant to the city and regional

economy. These and the other working piers in the neighborhood provide regular distribution of goods and other economic services. In addition, the Committee identified some of these locations, particularly Atlantic Basin, as potential locations for future economic development, particularly for the growth of water-based transportation services and industries that could be key to Red Hook's economic resiliency.

These piers are also well-positioned to provide key recovery support functions following future disasters. In particular, the Buckeye fuel terminal at the foot of Court Street has traditionally held many grades of diesel and could be a key resource for fuel in times of power outage and fuel shortages that frequently follow disasters. Any working pier could enable evacuation out, supplies in, and interim ferry service in addition to the pier's normal functions.



Kayaking is a popular activity at Valentino Pier Park.
Source: Carolina Salguero



Harvest Fest at Added Value Farm.
Source: Jojo Demirel



Parks were used as staging areas for relief efforts following Sandy. Source: Jojo Demirel



Natural and cultural resource assets

Natural and cultural resources are located throughout the Red Hook Planning Area, including many parks and recreation assets. These assets are located both on the waterfront and inland. Waterfront parks including Valentino Pier Park and Erie Basin Park (publicly accessible though privately owned) provide the Community key public access points to the water in an area where the waterfront is largely privately owned. More inland parks, such as Coffey Park, provide key community gathering locations, and the

Red Hook Recreation Area draws and serves users from Red Hook as well as surrounding neighborhoods with its track, ball fields, pool, and other recreational amenities. Community agriculture at Added Value Community Farm and now at the NYCHA Red Hook West Community Farm provide fresh food as well as service opportunity to the neighborhood. **In addition, many of these assets have open space and will be key gathering places in future emergencies as they were during Sandy.**

Red Hook also includes part of the Brooklyn Waterfront Greenway. Plans for the Greenway ultimately intend for it to connect the entire Brooklyn waterfront with a multi-use path and open space. In Red Hook, the greenway currently runs along a combination of on-street and off-street routes and connects the neighborhood to a variety of recreational and other destinations to the north including Brooklyn Bridge Park.

Assessment of risk to assets and systems

The assessment of risk to specific assets or systems of assets in a Community produced important information to help guide Planning Committee decisions about projects and priorities. Risk from future storms and flooding is evaluated based on three factors: hazard, exposure, and vulnerability. This risk analysis has been used to inform the identification and development of projects, particularly those that protect assets from flooding. It was also used to help evaluate the risk reduction potential of some of the Planning Committee's Proposed and Featured Projects.

Hazard can be described by each asset's location relative to the NYS DOS risk areas. Most (64%) of Red Hook's assets are located within the high-risk area with an additional 25% in the extreme-risk area and only 11% in the moderate-risk area. As a peninsula, Red Hook is highly exposed to coastal flooding, though it is somewhat sheltered from damaging wave action due to its location in the harbor. While not exposed to waves, low-lying elevations as well as the fact that the majority of the neighborhood is built on filled wetlands leads to increased flood risk for most assets.

The neighborhood as a whole remains highly exposed to the same sort of flooding and resulting damage and wider impacts that

occurred following Sandy. Due to slow release of insurance and other funding sources for repairs, regulatory hurdles and technical difficulties, few building owners have been able to implement resiliency upgrades that would protect them from a 100-year storm event or another Sandy-like event. Regulatory hurdles include the reality that many of the rules governing improvements that must be made to homes in order to qualify for flood insurance reductions are difficult to achieve and historically not designed for attached or multi-family homes in urban conditions. The attached and multi-story buildings prevalent in Red Hook, largely of brick or masonry construction, are virtually impossible to elevate and can be challenging and expensive to flood-proof or otherwise retrofit for resiliency.

Most (58%) of the neighborhood's health and social service assets are located within the high- and extreme-risk areas, and many services were severely strained following Sandy. With headquarters located in the high- and extreme-risk areas, organizations that were critical to the recovery were also hard hit by the storm and remain at risk for future storm events. The Joseph P. Addabbo Family Health Center, while now up and running again, is still at risk. The backup generator that provided power during the prolonged outage after Sandy was loaned

temporarily, and so the area's only medical clinic remains highly vulnerable to power outages which would impair its ability to provide services.

Approximately 65% of commercial buildings and 70% of industrial and manufacturing buildings in Red Hook are in the NYS DOS extreme- and high-risk zones.⁴ The most at-risk assets are located along the waterfront, and primarily consist of economic assets, including Fairway Market, the Red Hook Container Terminal, the Brooklyn Cruise Terminal, Erie Basin Barge Port, Gowanus Bay Terminal and Buckeye Fuel Terminal. These assets are at greater risk due to their higher exposure to coastal flooding, and they generally experienced longer recovery times following Sandy. In many instances, increased vulnerability is inextricably linked with the asset's economic function as it relates to the waterfront. For Red Hook's maritime industries, easy and consistent access to the water is critical to their day-to-day operation, though their direct connection to the water also makes them vulnerable to the effects of flooding. In other instances, though highly exposed to future hazards, building design has reduced the asset's vulnerability to damage from flooding and has reduced its relative risk. This is the case with IKEA. With key building elements largely elevated

above ground-level parking and solar panels on its roof for backup power, IKEA is less vulnerable than many other waterfront assets.

Some industrial assets also present an added risk to other assets through the potential release of toxic substances. New York City Department of Environmental Protection (NYC DEP) has conducted inspections of sites in the floodplain known to contain hazardous materials and generally found conditions to be safe.⁵ However, given the long industrial history of the area and ongoing industrial uses, the potential release of chemicals, diesel fuel, and other potentially hazardous materials into the community during a storm event remains a risk.

While not located on the waterfront, Red Hook's key retail corridors are also vulnerable to future flooding. Almost 80% of Red Hook's commercial floor area is located in high- and extreme- risk areas.⁶ Similar to many neighborhoods in New York, Red Hook retail establishments frequently utilize below-grade space for storage and mechanicals, making inventory and utilities highly susceptible to loss and damage during a flood event. This condition caused many businesses to be hard hit by Sandy and, with limited funding available for preventive resiliency measures, businesses continue to face challenges to preparing for the threat of future

storm events. Micro-businesses—comprising more than half of Red Hook's businesses—are often relatively mobile with limited physical inventory and therefore can be particularly resilient. However, many are still at risk to flooding and lack the resources necessary to finance resiliency measures or heavy recovery efforts after a storm.

All of Red Hook's housing assets are located within the high-risk area and are at risk from damage caused by storms, as evidenced by the significant impact of Sandy on the Red Hook Houses as well as a range of other housing types within the neighborhood. As most of the housing assets in Red Hook are located in low-lying areas, most residences were impacted by Sandy and continue to be exposed to future flooding. Approximately 55% of residential properties and 65% of residential floor area in the Red Hook Planning Area are located within the high-risk zone. Additionally, most housing assets face significant risk as a result of both physical construction and the relative vulnerability of their residents. Much of Red Hook's housing stock is in older buildings, which are more susceptible to damage if flooded than newer construction built to more recent building codes. Some residential areas, including historic Pioneer Street—one of the only remaining streets of this housing type—have below-grade first floors which make them

Assessing Risk

Risk, in this context, is the potential for an asset to be damaged or destroyed in a future storm event. The assessment of risk to assets or systems of assets in a community produced important information to evaluate needs and opportunities and help guide Committee decisions about resiliency strategies and projects. The NYS DOS developed a risk assessment tool that is aimed at understanding flood risk to community functions to support this process. The tool assigns each asset a risk score by evaluating three factors:

Hazard: the likelihood and magnitude of future storm events

Exposure: the local topographic and shoreline conditions that tend may increase or decrease the impact of coastal hazards

Vulnerability: the capacity of an asset to return to service after a storm, taking into account its material strength relative to the coastal hazard as well as its regenerative capacity

Collectively, hazard, exposure, and vulnerability determine the risk that an asset could be damaged or destroyed by a coastal storm event. This analysis identifies which assets within the Community are most at risk from future storms in comparison to other assets. Further, it allows potential projects to be evaluated by their ability to reduce risk to assets. For access to the NYS DOS Risk Assessment Tool and additional information how to use it, see: <http://stormrecovery.ny.gov/resources-0>



The waterline at certain locations on the waterfront was close to 6 feet.

highly susceptible to flooding, even during more frequent rainfall events. These assets remain at risk during future hazards both directly and due to potential damage to the systems that serve them.

Red Hook's utilities—particularly sewage services, electricity, and gas—remain exposed and vulnerable to damage from future flooding. The age, capacity and general vulnerability of the neighborhood's infrastructure systems were cited as significant concerns.

The neighborhood's stormwater and sanitary sewer system is at significant risk and increases the potential for flood damage to the other assets it serves. While the Red Hook Wastewater Treatment Plant, located north of the neighborhood, was not severely impacted during Sandy, the plant is vulnerable to flooding in the future with much equipment under the Federal Emergency Management Agency (FEMA) Base Flood Elevation. The Van Brunt Pump Station had been subject to flooding even before Sandy, and while it is repaired, it remains highly vulnerable to future storm events. The sewer system within the neighborhood as a whole remains highly vulnerable—there is no evidence that upgrades have been implemented to address ongoing drainage issues or the need to drain floodwaters that lingered following Sandy.

Residents also report flooding in low-lying locations and basements during less severe but more frequent weather events, and generally express that this has worsened since Sandy. This is exacerbated by Red Hook's location as the "bottom" of the sewershed—the flow of water and sewage comes down hill from surrounding neighborhoods into Red Hook. Residents and business owners have expressed concern about the system's ability to handle future development and increased runoff. The vulnerability of the sewer system could lead to increased risk for assets throughout the Community. The extremely low elevation of the neighborhood and the fact that it is largely constructed on what was once open water and wetlands leaves the drainage system vulnerable to rising sea levels, and potentially rising groundwater levels. Residents with basements and garden apartments in the vicinity of Richards and Pioneer streets in particular observe increasingly frequent flooding of their basements.

Electrical and natural gas systems in Red Hook as a whole, and the Red Hook Houses in particular, are also at risk and heighten the vulnerability of people and assets throughout the neighborhood. Above-ground power lines, by which a significant portion of the neighborhood is served, are more vulnerable to wind damage and other hazards than below-ground lines. The age of the system is also likely to mean that much of the system is more vulnerable to damage than

a newer system with more recent technologies and less wear and tear. In addition, the system as well as individual building electrical still suffer from damage sustained by Sandy and are at heightened risk of damage from future storms, or simply more likely to fail under the pressures of normal use. Further, continued vulnerability at power-generating facilities and substations means that overall, the system remains at risk to power outages following coastal storms. The threat of electricity loss exists not only from future hurricanes and coastal storms, but also from other potential emergencies, including brownouts. The natural gas system also remains at risk as the causes of service interruptions during Sandy—entry of water into the system through vent lines that did not extend above the flood elevation—have yet to be addressed.

The lack of sufficient transportation options and limited connectivity to surrounding neighborhoods increases the vulnerability of assets throughout the neighborhood. In a storm event this would limit the access that residents, business owners and service organizations have to the goods, services, and skills necessary to prepare for disasters and aid in recovery. The lack of transportation options, particularly in forms of public transportation, increases the vulnerability of residents and employees in the neighborhood who rely on transit. Redundancy can be vital in

emergencies, should particular transportation modes be compromised. While it provides one form of vehicular access, the elevated Gowanus Expressway also limits vehicular, bike, and pedestrian access between Red Hook and surrounding neighborhoods on at-grade streets, including the Smith and Ninth Street subway station, contributing to the neighborhood's isolation.

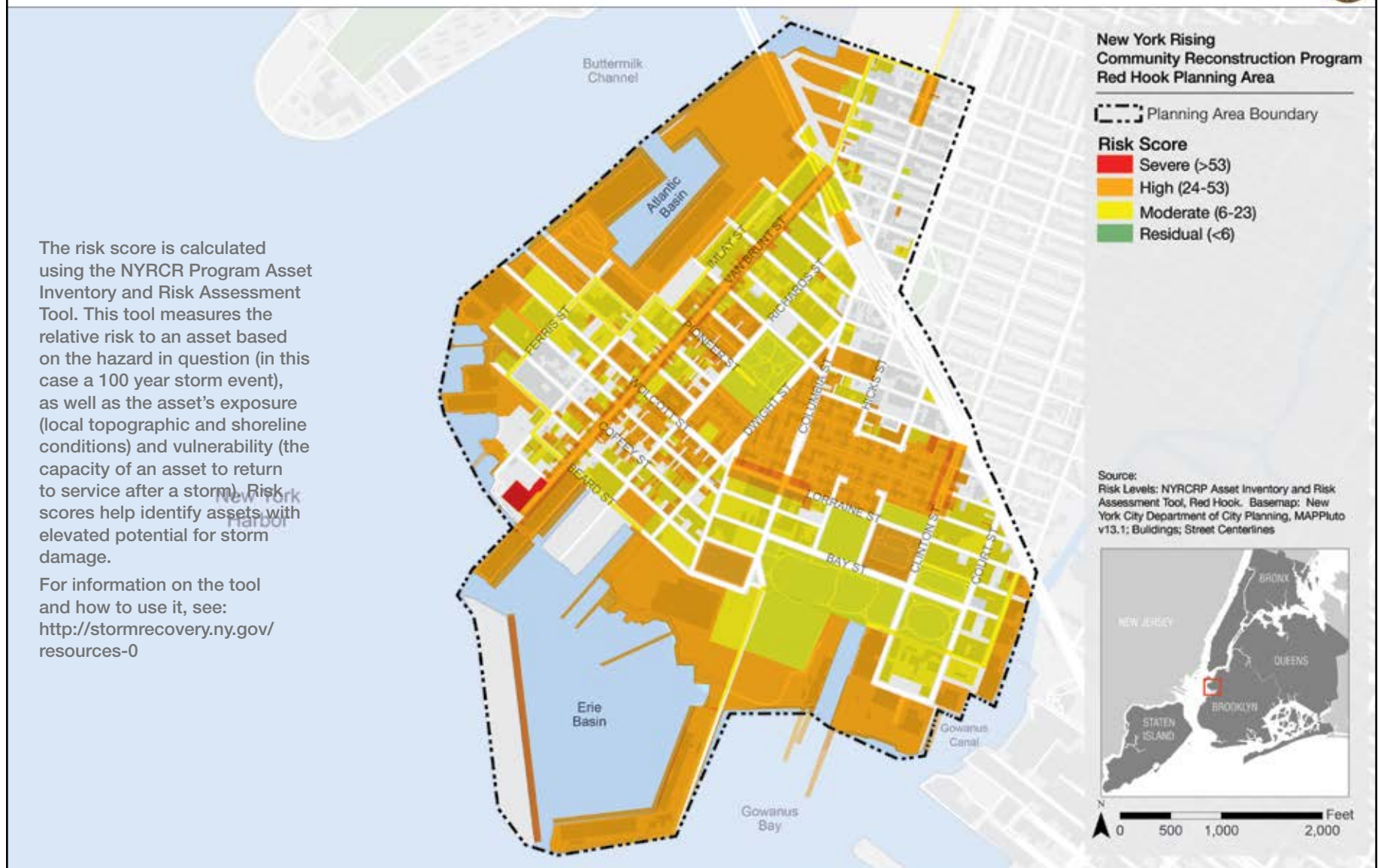
Additionally, some of the existing transportation systems themselves are vulnerable to damage and closure from future storms. While flooding of the Hugh L. Carey Tunnel came only from the Manhattan side during Sandy, the tunnel connecting Red Hook to Manhattan is at risk to flooding from both entrances in the future. While the Smith and Ninth Street subway station itself is elevated, its entrance is low, and access to the station over low-lying roads and sidewalks could be compromised by future storms.

A number of Red Hook's natural and cultural assets are on the waterfront and vulnerable to coastal flooding. Valentino Pier and Erie Basin Park are located in extreme- and high-risk areas. Some of the natural assets are better protected: The athletic fields at the Red Hook Recreation Area, for example, are on higher ground and located in the moderate-risk zone.



Source: Jojo Demirel

Figure II-6: Risk scores



B. Assessment of needs and opportunities

Planning Committee Meetings and Public Engagement Events identified key resiliency needs and opportunities in Red Hook.

Community members identified a variety of resiliency needs for Red Hook as well as key opportunities to address the gaps in the Community's collective resiliency to both moderate and severe storm events. These needs and opportunities reflect the first-hand experiences of residents and their knowledge of risks, challenges, and opportunities across Red Hook. Supported by the outcomes of the asset inventory and risk assessment, the identified needs and opportunities provide a baseline body of knowledge upon which overarching reconstruction and resiliency strategies are formed and subsequent Proposed and Featured Projects emerge.

The following list summarizes the input received from the Community on the most important needs and opportunities. The Recovery Support Functions (defined on page 42) related to each strategy are presented below each strategy.



The Needs and Opportunities identified by the committee included physical resiliency measures as well as needs to bolster the community's ability to respond in the event of future disasters. Source: Jojo Demirel (top left); Carolina Salguero (bottom)



Enhanced community planning and capacity building

Needs

Increasing the capacity of the Community to prepare for and react to future disasters is of critical importance to the Community.

In particular, local emergency preparedness and response plans need to be developed and disparate planning efforts coordinated. Better coordination among local, state and federal emergency response entities is also crucial to protecting the Community and the vulnerable facilities that provide services. Existing communication networks—both physical and social—need to be strengthened. In addition, a formalized relief center network, as well as a community-wide emergency preparedness program are needed to ensure better coordination during and after future disasters.

Opportunities

There is capacity within existing organizations and programs to be cultivated and expanded.

One example—Red Hook’s free WiFi network, maintained by the Red Hook Initiative—presents a unique opportunity to strengthen a local and redundant communication network. Other opportunities exist to leverage the strong organizational capacity that developed in the wake

of the storm. During Sandy, local organizations mobilized to provide services. Facilities on higher ground and those that retained power became impromptu community relief centers, serving as central locations for support and recovery after the storm. The Red Hook Coalition’s emergency preparedness planning efforts—the Long-Term Community Preparedness Recovery Planning Process, which is working to develop a communications network, and the Emergency Response Team Program—as well as the ongoing programs of schools and community-based organizations (CBO) throughout the neighborhood are also initiatives that could be leveraged to address the need for emergency preparedness.



Improved health and human services

Needs

With limited and vulnerable healthcare resources in Red Hook, it is essential that access to resilient healthcare services is provided after disaster events. Red Hook is a “medically underserved area” according to the U.S. Department of Health and Human Services analysis, and there is both a shortage of healthcare facilities in the vicinity, and a need for a resilient

healthcare provider in the neighborhood. Past disruptions and challenges to operations at Long Island College Hospital (LICH) in Brooklyn have highlighted the importance of having access to adequate healthcare services nearby. In addition to the need for access to resilient facilities, there is also an important need to increase the number of residents with healthcare knowledge in Red Hook who can provide immediate assistance in an emergency.

Following Sandy, the loss of inventory at Fairway Market and other food establishments, coupled with power outages and building damage, constrained local access to food. Red Hook sees a need to bolster existing food supply points and develop alternate strategies for local food supply during emergencies.

Management and mitigation of pollution release is also important to human health.

Given the presence of industrial uses in Red Hook—including open storage, vehicle storage at grade and the proximity of the contaminated Gowanus Canal—there is a critical need to mitigate pollution and contaminant-spill risks during flood events.



Economic resiliency

Needs

Many of Red Hook's commercial assets are vulnerable to flooding. Increasing the resiliency of these diverse commercial and industrial uses are major priorities for Red Hook. Many businesses need capital-intensive resiliency measures and would benefit from clearer information about retrofit options, in addition to the financial support to execute. Confusing recovery and insurance reimbursement applications has been a frustration for businesses; providing clearer directions and processes for these is a critical need. Increases in flood insurance costs are also a significant and pervasive concern among business owners and homeowners alike. In addition, many commercial establishments in Red Hook are located in historic buildings, which face unique rehabilitation challenges.

With an unemployment rate of 24% in Red Hook, and 75% among 18-24-year-olds in Red Hook Houses, the need to supplement existing education and employment placement opportunities is clear.⁷ Job creation and expanded economic opportunity in Red Hook are vitally important to the Community. Supporting a more integrated

and economically inclusive neighborhood is a priority for Red Hook, underlying almost all the needs discussed by the Community.

The Committee has also identified a strong need for more economic effective use of the waterfront. Waterfront uses and activities should provide economic benefits for the community through better use of existing piers or additional activation of waterfront spaces. In order to foster Red Hook economic resiliency via activation of the waterfront and to enable shoreline and in-water, as well as on-land, coastal protection measures to be explored in Red Hook and citywide, policies and permit procedures for in-water, on-water and waters-edge construction need to be re-examined. These exist at the city, state and federal level. A focus on repair of existing piers and construction of new piers where piers had historically been located will be important for the continued viability of maritime uses throughout the City. While respecting environmental concerns, a precedent for a shift in thinking can be seen in the City's revised Waterfront Revitalization Program (WRP) with its affirmation of maritime uses in language regarding Significant Maritime Industrial Areas (SMIAs), Ecologically Sensitive Maritime (ESMIAs) and Priority Marine Activity Zones (PMAZs).

Opportunities

Job-training programs tied to resiliency as well as provision of support to micro-businesses present valuable opportunities for increasing economic prospects for local residents through resiliency-related efforts, especially residents of the Red Hook Houses. Providing financial support for micro-businesses—a sector that typically has a very difficult time accessing traditional capital—will increase Red Hook's resiliency by diversifying the economy and supporting businesses that might be able to serve the Community in ways traditional businesses are unable to after an emergency event.



Resilient and affordable housing

Needs

With much of the housing stock at risk of flooding, increasing the resiliency of housing stock and making it more affordable is a top priority in Red Hook. The housing stock experienced substantial flooding, displacing a large number of residents for long periods of time. Many homeowners also need assistance in mitigating the financial burden of retrofits and higher flood insurance costs. Residents, like business owners, expressed frustration surrounding the challenges of aid and insurance applications and the need for clearer and faster

processes. Additionally residents now need guidance in repairing and retrofitting damaged and vulnerable homes.

The vulnerability of NYCHA Red Hook Houses is of critical concern to the Community. During Sandy, flood waters damaged critical systems and left residents without heat, hot water, or power. The Community recognizes these systems are necessary to the operation of Red Hook Houses and to the well-being of its residents, and need to be protected from future flood damage.

Rising housing costs due to higher flood insurance premiums, costs of resiliency upgrades, and other factors is a primary concern for Red Hook residents and developing methods to mitigate these costs is a key need.

Opportunities

The Sandy Design Help Desk, run by Fifth Avenue Committee, Architecture for Humanity, Enterprise Community Partners, and other organizations was a weekend-long workshop that provided homeowners with free technical assistance for resiliency upgrade needs. This event was able to provide a number of property owners with valuable information on building code and solutions to challenges facing their properties. This event not only helped homeowners make good decisions about resiliency and repairs, it also provided the administrators important information on the technical challenges that

building owners are facing, which can feed into a larger body of knowledge about resiliency best practices that can be publicly shared. With limited funding required, volunteer efforts such as this can help homeowners and can generate helpful information.



Improved sewer and drainage systems

Needs

Flooding during Sandy demonstrated the vulnerability of Red Hook's sewer and stormwater management system; flooding occurred via floodwaters from the harbor, but sewer back-up and drainage system failures also posed significant problems and impeded the removal of water following the storm. Frequent flooding of low-lying areas and basements due to sewer back-up and poor drainage is also a prevalent issue in the neighborhood and was repeatedly raised as a critical concern by Committee members and the public. Such flooding occurs even during moderate rain events in many areas in Red Hook. Addressing chronic flooding issues as well as making the water management system resilient to and functional in the wake of extreme flooding events is an imperative need.

Opportunities

A number of existing initiatives and innovative ideas aimed at addressing these issues were presented to the community over the course of the NYRCR planning process. The Brooklyn Greenway Initiative's ongoing project to develop guidelines for integrated stormwater management and other resiliency strategies into the greenway as it is built out presents an opportunity that might be leveraged to address some of these concerns. Conceptual proposals presented by students of Pratt Institute's Recovery, Adaptation, Mitigation and Planning and Program (RAMP) for innovative, outside-the-box approaches to coupling sewage treatment to energy treatment also provided the Committee with new ways of looking at this need.



Better transit and accessibility

Needs

More transportation options, with a special emphasis on better transportation connections to Manhattan, is a top concern in the Community. Ferry service, select bus service, and other modes have been considered by community members. Enhanced transportation systems will support the long-term vitality of the neighborhood, and create alternative routes for use before and after future storm events. Ferry service in particular is seen by residents as an opportunity to increase

resiliency and improve the local economy. Bicycle and pedestrian connection improvements are also needed for both emergency evacuation and general enhancement of the Red Hook Community. Improving pedestrian connections throughout the neighborhood and under the Gowanus Expressway and creating bicycle connections that run through the neighborhood connecting Red Hook Houses with the rest of the area are key needs.

Opportunities

While no implementation action has yet been taken, the SIRR report proposes two initiatives for increasing access and transportation options for Red Hook: “Improve connections between Red Hook and the rest of Brooklyn” and “Call for the MTA to explore Red Hook Lower Manhattan bus connections.”⁸ The ongoing New York City Department of City Planning (NYC DCP) Red Hook transportation study is currently investigating transportation options and may present outcomes that can be leveraged to improve transportation options and connectivity. In addition, the forthcoming Final Report of the New York City Economic Development Corporation’s Citywide Ferry Study 2013 could provide insight into the opportunities for ferry service expansion to and from Red Hook.



Resilient and sustainable power sources

Needs

More resilient and redundant infrastructure will shorten the duration of power outages after a storm. Exploring a variety of options for alternative and environmentally sustainable energy sources as a possible answer to this need is supported by much of the Community. Providing redundant power at Red Hook Houses is a priority.

Opportunities

As a large, centrally managed and (mostly) net-metered property, Red Hook Houses presents an opportunity to pursue alternative energy sources. A variety of potential opportunities for alternative power supply were identified by the Committee. These included: the proposal by Red Hook Rise, for an alternative energy power and distribution network in Red Hook; the potential for using cold-ironing or shore power (on-shore power supply to power ships while they are docked) infrastructure “in reverse” to enable ship generators to power land-side activities during power outages; and the potential to use large parking areas (e.g., at the Cruise Terminal) for solar arrays. A number of incentive programs exist to study the feasibility of alternative power

generation or support development of alternative power systems. Grants and incentive programs for alternative energy systems such as solar power or microgrids are available through New York State Energy Research and Development Authority (NYSERDA), Governor Cuomo’s NY Prize competition, and other sources.



Protected natural and cultural resources

Needs

Red Hook’s expansive waterfront and ample open space are vital assets that should be preserved and enhanced. Public access to the waterfront should be increased and existing waterfront facilities need to be repaired and maintained for maritime, economic and recreation uses.

Opportunities

The waterfront also provides opportunities for waterborne emergency response efforts and distribution, enhancing resiliency. Additionally, existing and future cultural programs or facilities could be developed and programmed with the goal of uniting the diverse communities of Red Hook.



Coastal flood protection

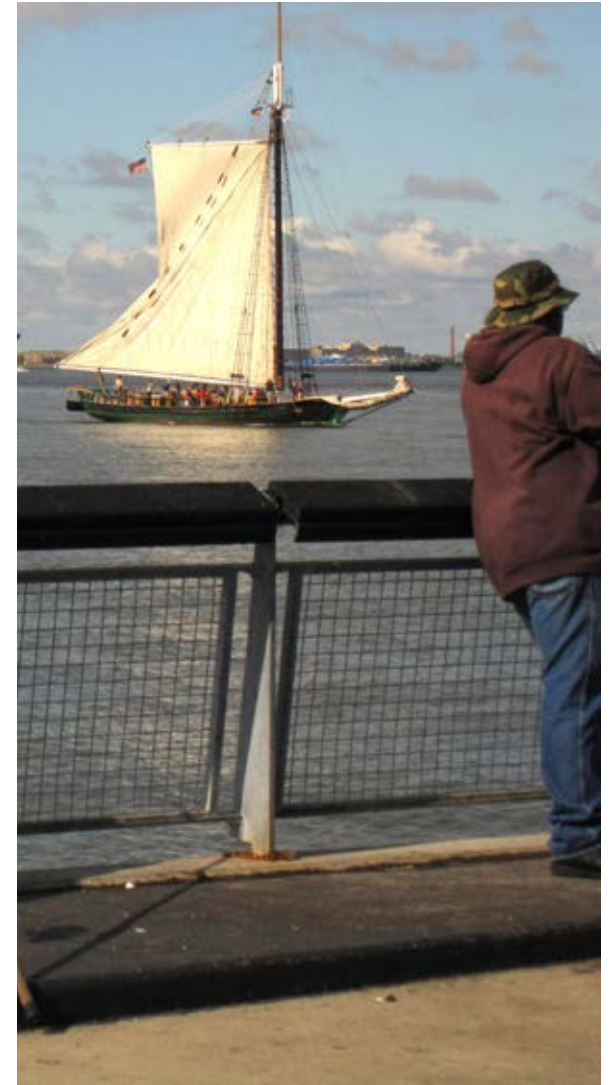
Needs

As a low-lying, waterfront community, Red Hook needs a comprehensive coastal protection system to limit damage from future flood events. Given the building types and uses found in the neighborhood, building level protection is challenging and costly. Thus, there is consensus around a need for neighborhood-wide protection strategy. Embedded within this need is a requisite to address potential City, State and Federal policy hurdles to implementing new forms of infrastructure, particularly if they are in contact with the water or shoreline. Any coastal protection strategy should preserve and enhance the existing character of Red Hook while providing protection to key commercial, residential, and cultural assets. This need encompasses and is interconnected with many of the needs already articulated.

Opportunities

Development of a coastal protection system also presents a unique opportunity to provide protection in a manner that can enhance the character and economy of Red Hook. There is a distinct opportunity to marry coastal flood protection infrastructure with infrastructure that supports recreation, stormwater management,

economic development, and other recovery support functions. While addressing this need will inevitably be a large undertaking, the commitment shown at the City and State levels to addressing this need is promising. “Install [an] integrated flood protection system in Red Hook” is among the coastal protection initiatives identified by New York City’s Special Initiative for Rebuilding and Resiliency in “A Stronger More Resilient New York” (SIRR report). This initiative, in conjunction with the announcement by Governor Cuomo that New York State will establish a \$200 million partnership with New York City to construct a comprehensive flood management system for Red Hook, creates a strong opportunity to address this need. There is also great opportunity for new thinking and innovative approaches exemplified in the many ideas generated through creative initiatives including the Pratt’s RAMP studios, the NYC Game Changers Competition, the HUD Rebuild by Design Competition, and others.

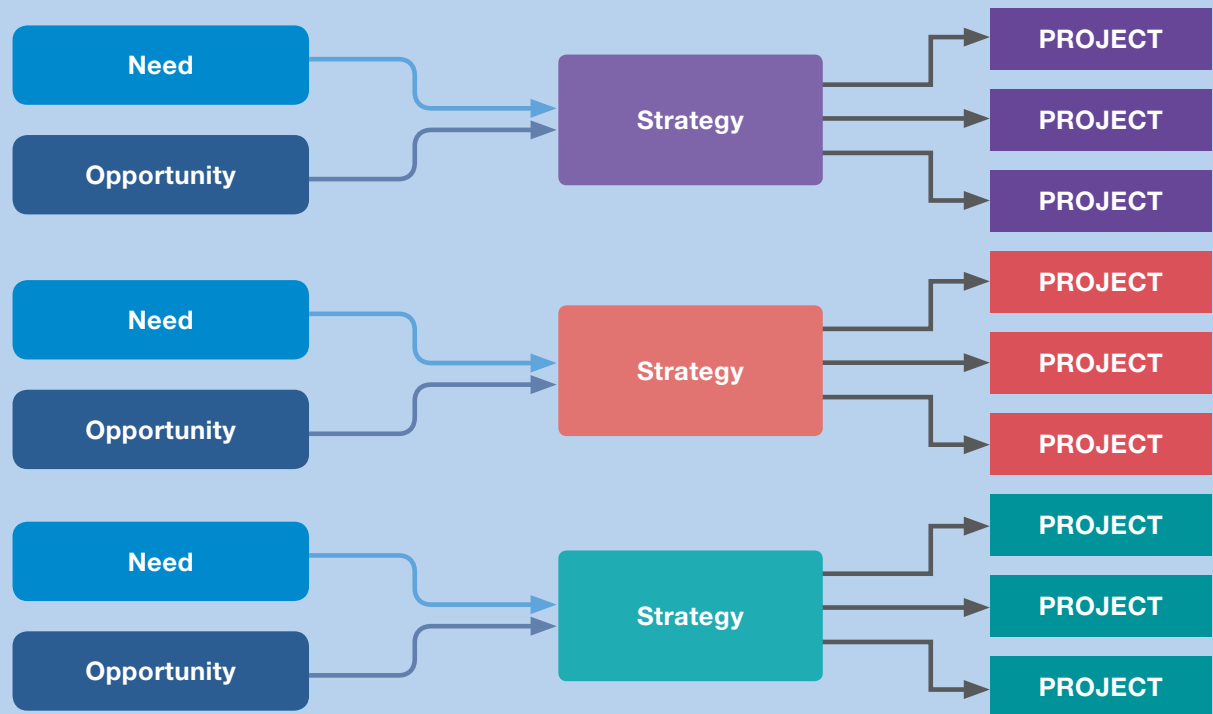


Source: Carolina Salguero

NYRCR Project Development Process

The projects in this plan were developed through the following Community-based process:

- Resiliency needs and opportunities were brainstormed through extensive public engagement. **Needs** were discussed in the context of reducing short and long-term risk and increasing the resiliency of assets, systems, and people. **Opportunities** to build off of existing community strengths were also identified.
- With a thorough, baseline understanding of the Community's resiliency needs and opportunities, the Committee identified overarching **strategies** to address the most critical needs in the community, and to take advantage of existing opportunities. Public input guided the refinement of these strategies.
- In order to implement strategies, the Committee identified specific **projects**. These projects directly address the needs and opportunities identified at the beginning of the process.





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III. Reconstruction and resiliency strategies

A. Reconstruction and resiliency strategies

Red Hook's assets, needs and opportunities led the Red Hook NY Rising Community Reconstruction (NYRCR) Planning Committee to develop a series of strategies for increasing resiliency within the Community. The Committee further refined these strategies with Community input to address interconnected needs and opportunities spanning multiple Recovery Support Functions. The strategies provided the framework that led the Committee to Proposed and Featured Projects and Additional Resiliency Recommendations. The following section presents these strategies, their associated Recovery Support Functions, and the Proposed and Featured Projects that will enact them.

Proposed and Featured Projects

Proposed Projects are projects that the Planning Committee recommends to be fully funded with the Community's NY Rising Community Development Block Grant Disaster Recovery (CDBG- DR) allocation. These are high priority projects that the Committee and Community support for funding because they address key resiliency needs, and provide immediate and/or multidimensional benefits.

Featured Projects are innovative projects for which an initial study or discrete first phase is proposed to be funded by CDBG-DR or another identified funding source, and which may require additional funding sources for full implementation.



Strengthen community capacity to prepare for, respond to, and recover from emergencies

A lack of adequate coordination, emergency preparedness, and response resources poses risks to the well-being of residents and businesses.

Creating an organized response system and increasing access to physical resources would ensure a coordinated response during and after future emergencies and is a top priority in Red Hook. In order to serve all Red Hook residents, the Committee proposes funding a relief center network that could operate through existing community centers and provide a variety of critical functions such as: the coordination of relief efforts, provision of backup power, distribution of food and goods, and the hosting of health and social services. This project would address multiple needs including the need for publicly accessible spaces with backup power, resilient communication systems, and better coordination, in addition to leveraging the experience and capacity demonstrated by the local community-based organizations (CBOs).

Supplementing this, the Proposed Project to install backup power at a critical community facility (likely a health center) would ensure that the local health network will function in the immediate aftermath of a storm. This would reduce risk to the participating facility, ensuring that residents have access to

critical resources and that the Community is able to maintain coordination with regional healthcare networks.

In addition to these Proposed Projects, healthcare resiliency projects and emergency planning efforts are needed. As previously mentioned, Red Hook does not have ample healthcare services during normal times and this is exacerbated in emergency situations. Ensuring sufficient healthcare resources are available in the neighborhood is critical and may be achieved through provision of a mobile health truck. By nature of its mobility, a mobile health truck could serve a greater catchment area and relocate outside Red Hook when a storm approaches, therefore remaining fully functional during the recovery phase. Medical service needs analysis indicates that Red Hook may have enough demand to require additional health facilities. However, the gap in access is not sufficient to support construction of a new local facility, nor would it be ideal to construct new healthcare facilities in a flood zone. Training local healthcare workers is another method for increasing local health resources and emergency preparedness. Existing Community Emergency Response Team (CERT) training programs present an opportunity to connect graduates to emergency services-career training tracks and

thereby increase the number of residents with medical training. These two Additional Resiliency Recommendations can address some of the shortfalls and vulnerabilities in the current system, and further strengthen community capacity. Connecting residents to medical training has the further benefit of strengthening individual financial stability, another key resiliency strategy identified by the Committee.

Establishing a local emergency preparedness plan is a need in Red Hook that a number of organizations are already beginning to address. The various ongoing emergency preparedness efforts should be coordinated with one another and integrated with the proposed relief center network. A citywide virtual resiliency information clearinghouse that includes local information could supplement the projects mentioned above and address the critical need for clear and coordinated information on recovery and resiliency resources needed to advance this strategy. This could help residents learn about relief center sites, health services, and job opportunities related to recovery. A central information clearinghouse could also provide specific information on housing and small businesses recovery and resiliency—addressing the need for information that residents and business owners have strongly expressed.

**Table III-1 – Strategy: Strengthen community capacity to prepare for, respond to, and recover from emergencies
(Proposed and featured projects)**

Project name	Short project description	Estimated cost	Proposed or featured project	Regional project
Relief center network	This project would fund the creation of a network of relief centers, to house the coordination of relief services following a disaster, such as food, water, power, health, medical services, and information. The project would provide funding to existing community facilities and organizations for building hardening, on-site capital improvements, and initial staffing costs. The network would provide both physical and informational resources in the wake of a disaster, and facilitate disaster preparedness coordination across community based organizations (CBOs) in advance of an event.	\$1.5 million	Proposed Project	No
Emergency backup generator for health and social services provider	This project would consist of the purchase and installation of one fixed generator, preferably hybrid/solar-powered, for a health and social service provider in Red Hook to ensure continuity of critical services to the Community during and after an emergency.	\$350,000	Proposed Project	No



Strengthen individual economic resiliency and financial stability

Ensuring residents' and business' financial stability through neighborhood-specific workforce training and financial assistance will be critical to economic development and recovery. Ensuring all Red Hook residents, particularly low-income residents, have access to economic opportunities is a primary objective in Red Hook and can address recognized Community needs for economic inclusivity.

The Proposed Project to fund a workforce development program to train Red Hook youth in construction would provide access to growing employment opportunities in the resiliency field in both Red Hook and the region. There are multiple workforce development and youth engagement programs in and around Red Hook—none yet focused on resiliency construction—providing a path for coordination and rapid implementation.

Another Proposed Project, a local financial assistance program that will provide grants and/or loans to micro-businesses, may also particularly benefit low-income individuals and expand economic opportunities for Red Hook residents. The benefits of this project are described in the Section IV. Proposed and featured project profiles.

Table III-2 – Strategy: Strengthen individual economic resiliency and financial stability (Proposed and featured projects)

Project name	Short project description	Estimated cost	Proposed or featured project	Regional project
Resiliency construction workforce training	This project would fund training of Red Hook youth and adults—particularly low-income individuals with limited employment experience and/or education—and connect them to employment opportunities related to the construction of resilient infrastructure or building improvements. The program would provide a multi-week training program, outreach, and job readiness preparation and post-training job placement services.	\$750,000	Proposed Project	No



Increase the resilience of existing businesses and promote opportunities for economic development

Business resiliency improvements supported by financial assistance programs designed specifically to address the needs of neighborhood businesses can promote comprehensive economic development and enhance the economic health of the Red Hook Community, addressing key vulnerabilities.

Through provision of accessible financial assistance, small businesses and start-ups are better able to undertake necessary resiliency upgrades. The Proposed Project to fund a local financial assistance program for small businesses and start-ups / micro-businesses could meet this need. Providing start-ups or micro-businesses with financial support for assorted start-up costs can support development of a diversity of businesses, and enable the expansion of economic opportunities in Red Hook.

Additional Resiliency Recommendations that support neighborhood-wide economic development should also be implemented to supplement financial assistance to individual businesses.

Increasing transportation options and activating the waterfront would also support an effective economic resiliency strategy in Red Hook. A ferry

landing at a central location in Red Hook and the extension of commuter ferry service could result in numerous resiliency and economic benefits. Residents would have access to a transportation option independent of other transportation networks that are vulnerable to storm events. Residents and businesses could benefit from the increased foot traffic and improved commute times to Manhattan. Linkages to Governors Island could also position Red Hook as the service entry for future commercial activity on the Island, with associated opportunities for local businesses.

Additional economic development recommendations include waterfront activation around and near Atlantic Basin and initiating a more collaborative relationship with the Port Authority of New York and New Jersey (PANYNJ) to achieve more strategic use of waterfront properties.

Understanding the economics of capital and operational resiliency retrofits for industrial businesses is also important as residents look to the future resiliency and use of their waterfront. Industrial businesses need information to determine the economic feasibility of making resiliency upgrades and, where this

is not feasible, to determine alternate land use strategies that can lead to ongoing productive use of waterside properties. Studying these issues and understanding the feasibility and impacts of how alternate land uses and incentive structures—such as mixed-use development whereby residential uses can subsidize costs for upgrades for industrial uses—can arm residents with knowledge to pursue the best economic development and resiliency strategy.

Increasing the resiliency of small businesses in parallel with comprehensive economic development strategies can help the Red Hook Community protect jobs and promote a vibrant neighborhood. Increasing boat traffic to Red Hook could result in economic and resiliency co-benefits through increased foot traffic to retail corridors, increased maritime business, and creation of transportation redundancies.

Table III-3 – Strategy: Increase the resiliency of existing businesses and promote opportunities for economic development (Proposed and featured projects)

Project name	Short project description	Estimated cost	Proposed or featured project	Regional project
Local financial assistance to small businesses, start-ups, and homeowners/tenants	This project would provide financial support to Red Hook small businesses and homeowners/tenants seeking to implement resiliency upgrades, as well as to entrepreneurs seeking to start micro-businesses. The program would be administered by a locally based organization, potentially with the involvement of a Brooklyn-based Community Development Financial Institution (CDFI).	\$1 million	Proposed Project	No

NOTE: the above project also addresses the next strategy: “Increase the physical and economic resiliency of private and public housing”



Increase the physical and economic resiliency of private and public housing

Mitigating risk to housing assets requires addressing the vulnerabilities of Red Hook Houses. Recalling the prolonged lack of power and other utility services to Red Hook Houses, the Committee has identified projects that address the loss of utility services. The Proposed Project to pilot solar-powered back-up lights in the stairwells would reduce risk for many residents by addressing important safety and health issues that were brought to light in the wake of Superstorm Sandy. Backup solar lighting would be a single step of needed resiliency upgrades in Red Hook Houses and should be supplemented with a comprehensive suite of resiliency upgrades including re-skinning buildings, addressing mold, and upgrading mechanical systems recommended in Section V. These recommendations may be integrated

into resiliency work New York City Housing Authority (NYCHA) already has planned including potentially creating a resiliency coordinator position and proposals to repair and elevate Red Hook House’s mechanical systems.

Mitigating risk to housing assets also requires providing financial resources and resiliency information to homeowners and tenants. The previously-mentioned local financial assistance program would also meet some of the housing resiliency needs in Red Hook. In addition to providing loans and/or grants to small businesses, the program would extend these financial products to homeowners and tenants willing to invest in their properties. This Proposed Project would therefore provide needed financial support to a number of residents, enabling them

to complete resiliency upgrades, reduce risk to their buildings, and potentially become eligible for insurance premium reductions.

Initiatives that address the burden of rising National Flood Insurance Policy (NFIP) premiums are also critical to achieving economic and housing resilience. The Homeowner Flood Insurance Affordability Act of 2014 took measures to curb premium increases and make the program more responsive to resiliency upgrades that are most feasible in urban environments (e.g. alternatives to elevating attached housing). The Committee recommends that reforms such as this, which lessen the burden of growing premiums for policy holders, continue to be pursued.

Table III-4 – Strategy: Increase the physical and economic resiliency of private and public housing (Proposed and featured projects)

Project name	Short project description	Estimated cost	Proposed or featured project	Regional project
Solar-powered emergency lights for Red Hook Houses stairwells (Phase I)	This project would fund the implementation of a solar-powered emergency lighting pilot project in two or three buildings in Red Hook Houses. This would provide backup lighting when the main grid fails, ensuring the safety and mobility of residents.	\$100,000	Proposed Project	No
Solar-powered emergency lights for Red Hook Houses stairwells (Phase II)	This project would expand the pilot to installation of solar-powered emergency lighting in all residential buildings in Red Hook Houses. This would provide backup lighting when the main grid fails, ensuring the safety and mobility of residents.	\$1 million	Featured Project	No



Create opportunities for alternative and/or redundant power generation and distribution

This strategy will not only address vulnerabilities of the power system itself, but will also improve the neighborhood's ability to address housing, health and social services, economic development and community and capacity building by reducing vulnerabilities created by power loss. Power is a necessary resource for emergency response and recovery, and access to an alternative or back-up power source is vital to ensure this service. As Sandy demonstrated, the electrical grid in Red Hook is

highly vulnerable to flood damage. Alternative power generation can provide the dual benefits of providing resilient power and doing so through an environmentally conscious method. A study of healthcare/cogeneration system feasibility at Red Hook Houses will lay the groundwork for future implementation of this concept. By identifying the key challenges and by costing and preparing a preliminary scope of work for implementation, the Proposed Project could enable steps toward microgrid installation at

Red Hook Houses. Construction of a microgrid / cogeneration system would provide considerable environmental benefits in the longer term, which would support sustainability goals.

The aforementioned Proposed Project to install solar-powered backup lighting in Red Hook Houses hallways helps advance this strategy in the short term and wider adoption could mitigate climate change in the long term.

Table III-5 – Strategy: Create opportunities for alternative and/or redundant power generation and distribution (Proposed and featured projects)

Project name	Short project description	Estimated cost	Proposed or featured project	Regional project
Red Hook Houses microgrid feasibility study (Phase I)	This project would fund a study to assess the feasibility of a microgrid that could provide backup power for Red Hook Houses—home to 50% of the Red Hook Community—during an emergency.	\$300,000	Proposed Project	No
Red Hook Houses microgrid implementation (Phase II)	This project would install a cogeneration facility or other alternative power source with a microgrid tie-in to provide backup power for Red Hook Houses—home to 50% of the Red Hook Community— during an emergency.	\$50 – \$500 million	Featured Project	No



Increase transit connectivity to facilitate evacuation and rebuilding

In order to address transportation system deficiencies that increase the vulnerability of people and assets, the NYRCR Red Hook Plan proposes projects that will ensure accessibility both in non-emergency times as well as during emergency events. Improved transit and accessibility can also help spur economic development in the neighborhood. A variety of transit modes can serve this purpose, including ferries and select bus service. The

Proposed Project to fund the construction of a new ferry landing in a central location could lay the groundwork for the extension of an existing ferry service to the Community. Increasing regular ferry service to Red Hook could expand access to goods and services following a disaster while providing transformative transportation options and economic development benefits. These Proposed and Featured Projects could provide benefits that extend beyond the Community

boundary—increasing transportation and emergency evacuation options for the wider region.

Establishing a direct bus line between Red Hook and Lower Manhattan is an Additional Resiliency Recommendation that would have multiple benefits if implemented. This project is critical to creating a more redundant transportation system and increasing transportation options.

Table III-6 – Strategy: Increase transit connectivity and redundancy to facilitate evacuation and rebuilding (Proposed and featured projects)

Project name	Short project description	Estimated cost	Proposed or featured project	Regional project
Construct a ferry landing at or near Atlantic Basin (Phase I)	This project would provide partial funding for the construction of a new ferry landing, at or near Atlantic Basin, contingent on a commitment of matching funds by a private/public entity to ensure completion of the ferry landing.	\$500,000	Proposed Project	Yes
Subsidize operation of a new or existing ferry route to Red Hook (Phase II)	This project would entail the ongoing operation of a regular commuter Ferry Service connecting Red Hook to Manhattan, and potentially Governor's Island and other destinations.	\$3 million-\$5 million annually	Featured Project	Yes



Improve drainage and reduce flooding from sewer backup

Better understanding of major drainage and sewer backup issues and investment in addressing them is necessary for infrastructure resiliency in Red Hook. In the short term, funding an initial study to better understand drainage issues in locations with acute flooding problems can be a catalyst for future change. With the cooperation of New York City Department of

Environmental Protection (NYC DEP), drainage improvements could be undertaken based on the results of the study and chronic drainage challenges could be addressed.

Completing repairs to the Van Brunt Street Pumping Station is an Additional Resiliency Recommendation that can help mitigate sewer

back-up during heavy rain events and ensure faster drainage following future storm events. This station is designated as one of the City's top five priority stations for repairs and has been deemed at risk from future storms.

Table II-7 – Strategy: Improve drainage and reduce flooding from sewer backup (Proposed and featured projects)

Project name	Short project description	Estimated cost	Proposed or featured project	Regional project
Red Hook drainage study	This project is a study to analyze the existing conditions that contribute to frequent flooding in Red Hook. By uncovering unknown details of existing conditions, the study would identify specific measures to improve drainage in the neighborhood..	\$500,000	Proposed Project	No



Provide coastal flood protection

Providing comprehensive flood protection could help address many of the needs, reduce risk for a range of assets. The plan to protect Red Hook through an integrated flood protection system proposed by the City in the Special Initiative for Rebuilding and Resiliency and the Governor’s “Reimagining New York for a New Reality” program, announced in January

2014, would provide substantial protection to much of Red Hook and is strongly supported by the Committee. Red Hook residents should be closely involved in the planning process for this system. The Community has generated draft principles to guide the development of this project so it can effectively protect and enhance neighborhood character, including increasing

access to the water. This strategy and project presents a long-term solution to flooding issues in Red Hook but because it will take many years to implement, short- and mid-term resiliency efforts still need to be undertaken throughout the Community. Proposed Projects presented in the NYRCR Plan address resiliency needs that this project does not address.

Table III-8 – Strategy: Provide coastal flood protection (Proposed and featured projects)

Project name	Short project description	Estimated cost	Proposed or featured project	Regional project
Red Hook integrated flood protection system	The Red Hook NYRCR Planning Committee applauds the recently announced State and City partnership to create an integrated flood protection system in Red Hook. The Committee recommends that the development of this project be conducted in accordance with community principles such as economic development, sustainable construction and local job creation. Through adherence to the principles drafted by the Committee, this project can both protect and enhance Red Hook.	\$200 million	Featured Project	Yes



Source: Carolina Salguero

IV. Implementation - project profiles

This section describes the proposed and featured projects identified by the committee with input from the community. Each project description includes a summary of the potential costs and benefits that would result from each project if funded. In addition to preliminary cost estimates, the project profiles discuss the projects' potential benefits:

- Health and social benefits
- Economic benefits, including potential job creation[ii]
- Environmental benefits
- Ability to reduce future risk

Finally, the descriptions describe relevant implementation factors, including the likely timeline and the governmental jurisdiction for implementation of each project.

Proposed and Featured Projects

Proposed Projects are projects that the Planning Committee recommends to be fully funded with the Community's NY Rising Community Development Block Grant Disaster Recovery (CDBG- DR) allocation. These are high priority projects that the Committee and Community support for funding because they address key resiliency needs, and provide immediate and/or multidimensional benefits.

Featured Projects are innovative projects for which an initial study or discrete first phase is proposed to be funded by CDBG-DR or another identified funding source, and which may require additional funding sources for full implementation.

Relief center network

p. 86



Emergency backup generator for health and social services provider

p. 96



Resiliency construction workforce training

p. 100



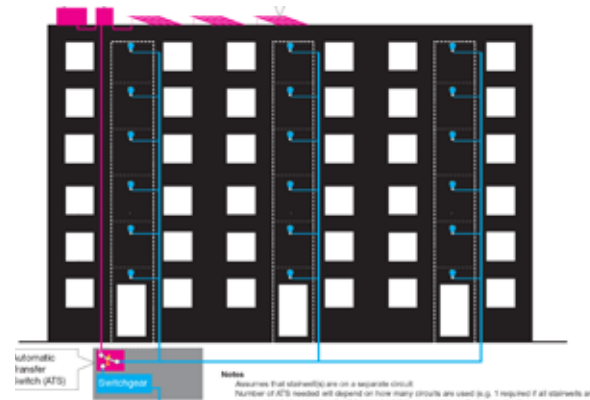
Local financial assistance for small businesses, start-ups, and homeowner/tenants

p. 106



Solar-powered emergency lights for Red Hook Houses stairwells

p. 112



Red Hook Houses microgrid

p. 118



New ferry landing and additional ferry service

p. 124



Red Hook drainage study

p. 132



Red Hook integrated flood protection system

p. 138



Project Overview

Recovery Support Functions



Community Planning



Health & Social Services

Cost

\$1.5M

Risk Reduction

HIGH

Health & Social Benefits

HIGH

Economic Benefits

MEDIUM

Timeline (years)



STRATEGY: STRENGTHEN COMMUNITY CAPACITY TO PREPARE FOR, RESPOND, AND RECOVER FROM EMERGENCIES

Relief center network

Proposed Project

This project would fund the creation of a network of relief centers to house the coordination of post-disaster relief services, such as food, water, power, medical services, and information. The project would provide funding to existing community facilities and organizations for building hardening, on-site capital improvements, and initial staffing costs. The network would provide both physical and informational resources in the wake of a disaster, and facilitate disaster preparedness coordination across community based organizations (CBOs) in advance of an event.

Project description

In the wake of Superstorm Sandy residents and business owners organized an immediate and local response system. Recovery services, such as distributing food, water, and supplies and going door to door to check on vulnerable populations, were provided locally and on a volunteer basis. This local response supplemented the response by government agencies and organizations such as NYC Office of Emergency Management (NYC OEM), NYS Division of Homeland Security and Emergency Services (DHSES), the Federal Emergency Management Agency (FEMA), and the Red Cross which provided critical, life-saving support throughout New

York City. The local response was an incredible feat and could be strengthened in the future by coordinating local efforts with NYC OEM and other entities prior to an event and clearly establishing roles and responsibilities for a specific operation.

The proposed relief center network would coordinate with NYC OEM and CBOs to provide relief services such as food, water, power, basic medical services, and information. Sites in the relief center network would be strengthened to reduce flooding, ensure power, and build community capacity prior to an event. Relief centers



In the wake of Sandy, PortSide NewYork set up a community aid station to help residents connect to resources. In the future a more formal network of relief centers operating through existing community centers could meet this need. Source: Carolina Salguero

would leverage the local knowledge and relationships of existing CBOs to coordinate across multiple providers of community-based emergency health and social services consistent with a local Emergency Preparedness Plan, and help to evaluate community needs and efficiently distribute resources.

The proposed relief center network would be a “hub” and “satellite” model. The hub would be a large community space where logistics, communications, and supplies can be managed and distributed. It would also have backup power, heating and cooling capabilities and allow for people to gather and connect with others. The center could also provide a regular meeting space

for emergency preparedness training programs such as Community Emergency Response Team (CERT) or Ready New York. The hub would serve as the primary neighborhood contact for NYC OEM and other emergency first responders and would coordinate with smaller satellite locations throughout the Community that provide additional distribution of supplies and information.

The relief center network model establishes formal collaboration between the hub and satellite sites and coordination with a local community-driven preparedness plan, increasing cooperation across CBOs in Red Hook. This structure can provide redundancies and also allow organizations with different expertise and resources to contribute important relief support—for example, a CBO that has strong relationships with a segment of the population within the Community might serve as a satellite site while a CBO with a large facility and staff might serve as the hub.

The relief centers in the network would not function as evacuation centers or shelters, but would instead offer services after the immediate dangers of an emergency have passed and community members return to start the recovery effort. They would function similarly to NYC OEM's Community Preparedness and Resource Centers, but would be smaller scale and community driven.

The hub and satellites would offer both physical and programmatic resources for communities after emergencies. Physical resources and programming at satellites may vary by location, but ideally satellites would also be bolstered with flood-proofing and backup power

in order to support the relief center network following acute events. The array of services to be provided across the hub and satellites would include:

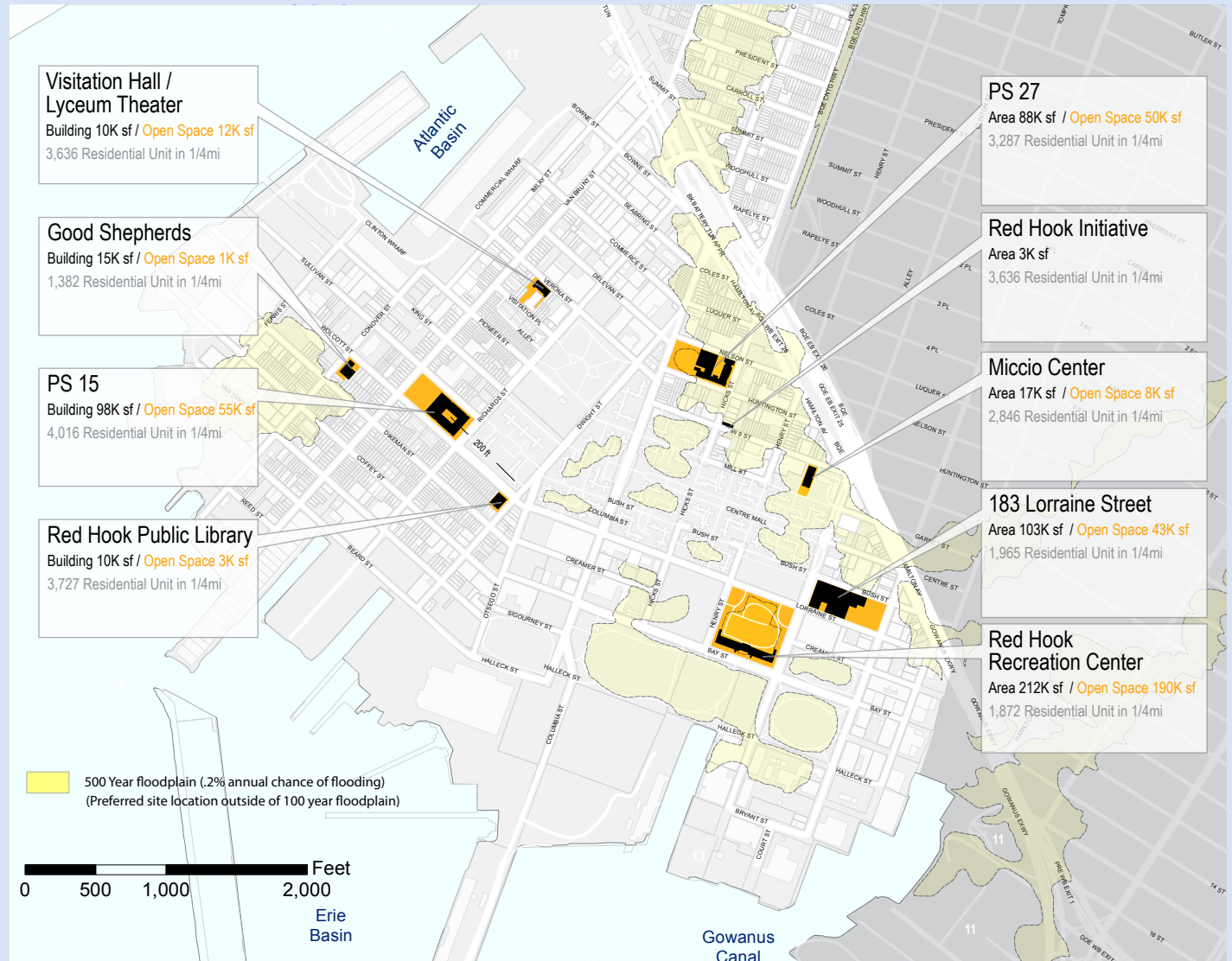
- Access to food, water, power, and basic supplies
- Information about both citywide emergency response activities and local efforts
- Non-urgent medical services (first aid, mental health, etc.)
- Social services (legal or financial counseling, food stamp aid, childcare, etc.)
- Translation services (based on community needs)
Power for cell phone usage / internet services

Because emergencies are unpredictable and irregular events, relief centers should be housed within existing buildings and organizations that provide year-round community services. Selection of sites and participating organizations would occur through a competitive process and be based on analysis of existing efforts in the Community, organizational capacity, facility capacity, proposed services, and potential to provide a cohesive network of support in conjunction with other selected sites.

The building that houses the relief center hub should meet certain physical requirements developed from Committee discussions as well as local and national best practice building and siting criteria, including:

- Location outside of the floodplain or in a flood-proof structure

Figure IV-1: Illustrative potential relief center sites



- Reinforced building (e.g., constructed to withstand heavy loads)
- Reliable source of power and heat/cooling
- Restrooms with showers
- Access to large outdoor space (e.g., parking lot) that can provide a staging area for relief services
- Large space on ground floor
- Size and services able to accommodate surrounding population expected to use services
- ADA-accessible

This project would fund capital improvements to help the hub meet these physical requirements. There are also important geographic considerations when selecting a hub site. The relief center hub should be located on a site in Red Hook situated outside of the extreme flood-risk zone and if possible should be in proximity to an evacuation route or a road with quick, reliable access to the route, vulnerable populations, commercial centers and corridors. The hub as well as satellite sites should be easy to access from the street and may have a parking lot (or other outdoor space) to accommodate relief vehicles or act as a service or assemblage area.

Satellite sites would serve a supporting role to the hub and therefore do not need to meet all of the physical requirements as the hub. Satellite sites should be physically distributed across the Community so that residents can access one within walking distance.

Based on needs identified by the Committee, the ideal relief center host organization for both hub and satellite sites would exhibit the following characteristics:

- Long history of community engagement and strong community ties
- Regular community programming and capacity to provide emergency programming
- Demonstrated ability to conduct outreach to vulnerable populations
- Capacity to provide a selection of social and/or health services
- Ability to fund the purchase of basic emergency supplies and equipment, such as radios or push-to-talk phones, or fuel for emergency generators
- Long-term occupancy agreement or ownership of the building
- Business continuity plan
- Financially stability

Embedded within the hub host organization would be a program manager. To ensure rapid response and effective coordination during an emergency, the program manager would be expected to maintain regular contact and coordination with satellite sites, NYC OEM, and others. The program manager would also manage disaster preparedness-related programming, which could include trainings and practice drills, “know your neighbor” events, and outreach to vulnerable populations. This staffing capability may be supported initially with the available funds, in the form of a part-time program manager for

two years to build capacity and coordinate activities across the network. After two years, the hub organization would be responsible for supporting these services on an ongoing basis, although responsibilities after the two-year ramp-up period may diminish to maintaining coordination channels and keeping the plan up to date. The program manager at the hub location would be responsible for ensuring the facility has basic emergency supplies and ready equipment, such as radios or push-to-talk phones, and fully functional backup power sources; this would likely require identifying other sources of funding.

Cost

\$1.5 MILLION

Approximately \$1.5 million could fund the development of a relief center network comprised of one hub and one or more satellite sites.

Relief centers would require funding to cover two types of expenses:

- **Capital to harden existing buildings.** Hardening costs would include backup power and floodproofing measures (the latter if the facility must be located in a floodplain).
- **Operating support to build participating CBOs' capacity** to support a part-time program manager to build capacity and deploy resources during an emergency over a two year period.

This estimate is based on engineer experience and assumptions based on generic building types and typical operating costs for projects of similar scope and scale. The exact costs of this would vary widely depending on how many facilities are ultimately selected to participate in the relief center network, the physical characteristics of those buildings and sites, and the programming planned for each site.

Key costs for facility improvements would likely include building hardening (including flood-proofing), backup communications equipment, and backup power. Fairly extensive floodproofing would be undertaken at the hub site in particular since the facility must be secure from flood damage. Interventions may include flood door barriers, elevated mechanicals, exterior and interior waterproof coating, check-valves etc. Backup power costs may include the cost of a fixed backup gas-powered generator. Solar-powered backup power is a more environmentally friendly option which could be pursued depending on the desired price range and the site.

While the costs for required capital improvements would depend upon the specific sites ultimately selected, a relief center hub with 12,000 square feet of usable space could cost approximately \$450,000 - \$650,000. A satellite site in a 7,000 square foot facility could cost \$400,000 - \$450,000. These cost estimates assume the mitigation measures implemented provide a high degree of flood protection since the majority of Red Hook is in the floodplain.

Costs for a program manager and emergency preparedness programming at the hub could also vary widely, depending on the availability of funds and the needs identified in the Community. The annual cost of the program manager and emergency preparedness programming (plus overhead) could range from \$20,000 - \$60,000, for a total project cost of \$40,000 - \$120,000 over the course of two years. Satellite sites might also receive a discretionary amount of funding for programming.

After two years, the organization would be responsible for supporting the program manager salary (with a potential decrease in time commitment after relief center ramp-up during the first two years), as well as programming and maintenance costs on an ongoing basis.

Each organization may opt for different supplies depending on its needs and capacity, but these additional supplies could include medical supplies, extended shelf-life food, water, blankets, walkie-talkies, ham radios, surge protectors, or fuel reserves. Participating organizations would need to identify alternative funding sources for these items.

Benefits

Health and social benefits

HIGH

A relief center network would ensure the continued provision and coordination of health and social services after a storm. The network would provide publicly accessible places with backup power where residents can receive temporary relief and can be directed to the

appropriate resources and locations to address health and social services needs. Through provision of supplies and coordination of information a formalized relief center would reduce the health and safety risks associated with a disaster for the entire Red Hook community.

Specifically, a relief center would reduce the risk of:

- Sickness or discomfort related to lack of access to basic medical supplies, food, water, heat, and other necessities
- Emotional or psychological distress
- Displacement of children, relatives, and friends who might need to relocate to receive services

Vulnerable populations such as seniors and physically impaired residents stand to benefit the most as they are more likely to need assistance, yet less likely to have reliable and convenient access to critical supplies and services. Assuming the Red Hook Planning Area boundary as the catchment area, the relief network would specifically benefit the following vulnerable populations:

- Low-income residents: Approximately 5,000 residents (38% of the population) live below the federal poverty line²
- Non-native speakers: Approximately 1,600 residents (13.2% of the population) speak English “not well” or “not at all”³
- Senior population: Approximately 1,100 residents (9% of the population) are over the age of 65⁴

The project would also reduce vulnerability and limit business interruption for community organizations operating each hub. Emergency plans, floodproofing, and backup power would allow these organizations to continue to operate business in the wake of emergency events. Further, the funding provided by this program would increase the capacity of the organization to conduct emergency preparedness outreach and planning and increase the organization's ability to support its constituents overall.

Economic benefits

MEDIUM

The relief center network is likely to support a part-time employee embedded in a CBO to help plan and build organizational capacity at hubs and across satellites over the course of two years. Capital expenses associated with hardening community centers would also create a small number of temporary jobs for construction and installation of resiliency building improvements.

Additionally, by protecting vulnerable populations, an emergency relief center supports diverse and thriving neighborhoods, which helps improve quality of life, a strategy in line with the New York City Regional Economic Development Council's Strategic Plan.

The relief center network would benefit NYC OEM and other local government agencies, likely saving them money by enabling them to respond to emergency events more efficiently with fewer resources going to coordination efforts. By increasing the Community's capacity to respond

to local needs and coordinate effectively with NYC OEM, both local organizations and regional emergency response entities would benefit. NYC OEM would need to dedicate minimal resources to maintain coordination with the relief center network but these would be far outweighed by long-term efficiencies.

Cost-benefit analysis

This project has broad public benefits and particularly serves vulnerable populations—key priorities of the Committee. A Red Hook relief center network would provide numerous benefits to the Community in the event of a disaster, including reducing overall risk to the well-being of residents—especially vulnerable populations—and providing critical health and social services. In addition, the project would benefit the Community year-round due to the increased capacity and coordination among CBOs participating in the network.

The reduced vulnerability of all Red Hook residents justifies the relatively modest cost of implementing this project.

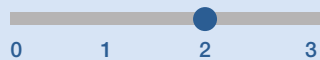
The benefits of the network would be sustainable beyond the two-year Community Development Block Grant - Disaster Recovery (CDBG-DR) funding period so long as the partnering organizations dedicate modest resources to maintain emergency equipment, update emergency plans, and maintain communication with the other relief network locations as well as the City. There are no apparent negative externalities associated with the Proposed Project.

Risk reduction

HIGH

A relief center network would reduce the risk of flood damage for the two to four facilities participating in the program. More importantly, the network would reduce risk to Red Hook residents by providing publicly accessible back-up power, a centralized source for information, social and support services, and more secure emergency services due to the redundancy inherent in a network of relief centers.

Timeframe for implementation



Once the project has been formally initiated, it would take approximately one to two years for capital improvements to be completed. Operations would continue for two years. The key issues that could most dramatically affect the timeframe are the length and format of the selection process and the physical challenges that may emerge with backup generator installation, flood-proofing, or other capital improvements.

Regulatory requirements

It is anticipated that no regulatory review would be needed for the execution of this project. However, NYC OEM must be involved in implementing this project to facilitate coordination with citywide emergency preparedness efforts.

Project implementation would begin with a competitive bidding process that would invite local organizations meeting certain criteria—including those mentioned

above—to apply to participate in this program. This process would take into account existing conditions, emergency planning efforts, organizational capacity, and other community characteristics. It is estimated that this bidding process—from initial survey to the release of the solicitation—would take approximately two to four months.

Subsequently, a program manager must be hired and implementation of capital improvements must begin. Depending on the scope of the work, and taking into account the seasonality of construction, this construction phase could take 6-18 months. Programming can be implemented in a shorter time, ideally three to six months after the program manager is on board.

Jurisdiction

The relief center network would be located in Red Hook and the development of the relief center network would fall under the jurisdiction of New York City laws. Because the sites would provide relief and not function as shelters or evacuation centers they would not be held to FEMA regulations.



Future recovery efforts could be bolstered by a strong relief center network. Above: recovering from Sandy. Source: Jojo Demirel

Project Overview

Recovery
Support Functions



Infrastructure



Health & Human
Services

Cost

\$350,000

Risk Reduction

HIGH

Health & Social Benefits

HIGH

Economic Benefits

MEDIUM

Timeline (years)



STRATEGY: STRENGTHEN COMMUNITY CAPACITY TO PREPARE FOR, RESPOND, AND RECOVER FROM EMERGENCIES

Emergency backup generator for health and social services provider

Proposed Project

This project would consist of the purchase and installation of one fixed generator, preferably hybrid/solar-powered, for a health and social service provider in Red Hook to ensure continuity of critical services to the Community during and after an emergency.

Project description

In much of Red Hook, power was unavailable for an extended period following Superstorm Sandy. Without electricity for basic utilities (lights, water pumps, refrigeration, etc.), or machinery critical to repair and recovery (pumps/wet vacs, power tools, etc.), lack of power caused hardship for residents and businesses alike and slowed the pace of recovery.

This project would consist of the purchase and installation of a fixed generator, preferably hybrid/solar-powered, for an emergency or health services provider in Red Hook. To receive funding for the purchase and installation of a generator, the facility/organization would need to demonstrate past involvement in community disaster

recovery and make a formal commitment to providing such services in the future. This project would complement Red Hook’s parallel Proposed Project to fund creation of a network of relief centers, which includes the purchase and installation of fixed generators at those sites.

A permanent standby generator would provide a resilient power source for the key facility during and after emergencies, providing backup power in the event of larger grid failure, allowing the organization to continue to function during a period following a disaster when much of the neighborhood is without power.

Back-up Generator

What generator is needed?

Generator sizing is based on a combination of factors including building size, building type, and existing electrical systems. Ultimately, determining generator sizing rests on which building activities and systems will be in use during an emergency.

Generator Size (kW):	50	100	150	200	250
Approx. Building Size (sf):	5000	10,000	12,000		

Generators can be powered by natural gas or diesel. Diesel generators will be coupled with storage tanks to ensure fuel is available in the event of an emergency.

Fuel Storage: (gallons)	420	775	1270	1730	2135
4 days, 14 hrs					
Fuel Storage: (gallons)	840	1550	2540	3460	4270
8 days, 14 hrs					

Generator Location

Considerations:

Generators must be placed above flood elevation. Generators can be placed on raised concrete mounts or on structurally sound rooftops. For diesel generators mounted to rooftops, fuel tanks will be placed on ground level with fuel pumped to the generator



The generator would be permanently installed to ensure that it is not at risk to future flooding or other natural disasters (depending on the location selected). To maximize reliability and minimize fuel storage, the primary power source to the generator would most likely be natural gas and would require a natural gas hook-up. A hybrid/solar generator system or a dual fuel generator system with backup liquid fuel is recommended in order to maximize

flexibility and benefits. Solar power is highly recommended by the Committee as a power source or backup power source as it would minimize the carbon footprint and mean that energy generation would not be dependent on fuel distribution systems that could be interrupted during an emergency. Liquid fuel, such as diesel, should also be considered given the presence of the fuel terminal.

Generators are a feasible and tested power source in the face of future hazards, particularly during recovery efforts. There were several examples of facilities throughout New York City that remained functional during Superstorm Sandy, despite the extensive power outages, because they had backup generators including at least five hospitals.

Cost

\$350,000

This cost includes the purchase and installation of a 100-kilowatt generator to serve a building assumed to be approximately 10,000 square feet in area. This estimate is based on engineer experience with projects of similar scope and scale, and would likely vary as the project is further developed and refined. It is based on the assumptions that electrical equipment is conducive to required alterations and connections, and that there is excess available space in the facility for the installation of new equipment.

Additional considerations and added amenities which could increase the cost of the generator include:

- Installing a natural gas connectionInclusion of solar-powered backup (would vary by size, but likely similar in cost to the generator)
- Extensive hardening or elevating the generator
- Environmental testing and abatement for asbestos and other materials
- Demolishing existing equipment

- Altering existing building structures
- Removing walls, windows, or doorways associated with the installation of the equipment

Benefits

Health and social benefits

HIGH

As discussed above, a major benefit of this project would be ensuring that local residents in need of health services during and after emergencies would be able to secure them. Services could include basic physical and/or mental healthcare.

Economic benefits

MEDIUM

By enabling the selected health services provider to continue operations when it would otherwise be without power, a backup generator would reduce economic loss after a disaster.

Environmental benefits

MEDIUM

This project would result in opportunities for environmental benefits if a hybrid/solar generator system is designed and installed. Solar power is renewable and pollution free.

Cost-benefit analysis

Through the provision of power during and following times of emergency, this project would provide health and social benefits to local residents, risk reduction benefits to the operations of health and social service organization where the generator would be installed, as well as additional economic and environmental benefits to the Community through sustained operation of the facility when it would otherwise be unable to operate. These extensive benefits would be anticipated to be sustainable over the approximately 25-year useful life of the generator.

The main costs associated with this project would be in implementation, operations, and maintenance. There would be costs to the generator owner/operator to test the generator monthly and to ensure that it continues to work in the case of an emergency. A hybrid/solar generator system would require very little additional maintenance.

Alternative approaches to reducing vulnerability to power loss, such as system-wide repairs, are likely to take longer, and while these should continue to be pursued by the City and power operators, backup generators would provide a more immediate solution for the Community in the near term. These far-reaching benefits justify the cost of this project.

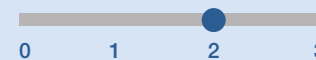
Risk reduction

HIGH

This project would result in decreased vulnerability to power loss in the building where the generator is installed. The project's main goal is to reduce the vulnerability of local residents and workers by providing access to power and

services during and after an emergency, thereby reducing adverse health impacts and facilitating a quick recovery. The emergency power system would allow resilient health services providers to protect vulnerable populations in particular, including children and seniors.

Timeframe for implementation



Implementation would begin with a competitive bid process for organizations meeting certain established criteria, to select the most appropriate organization and facility to receive this generator. This process could take three to six months. A generator of the size assumed above could be designed, procured, and installed within one year of site identification.

Regulatory requirements

Implementation would require permitting from the New York City Department of Buildings (NYC DOB) and coordination with several additional entities, including the Fire Department of New York (FDNY), Con Edison, National Grid, and the Bureau of Electrical Control.

Jurisdiction

This project would fall under the jurisdiction of the City of New York.

Project Overview

Recovery Support Functions



Cost
\$750,000



STRATEGY: STRENGTHEN INDIVIDUAL ECONOMIC RESILIENCY AND FINANCIAL STABILITY

Resiliency construction workforce training

Proposed Project

This project would fund training of Red Hook youth and adults—particularly low-income individuals with limited employment experience and/or education—and connect them to employment opportunities related to the construction of resilient infrastructure or building improvements. The program would provide a multi-week training program, outreach, and job readiness preparation and post-training job placement services.

Project description

Red Hook’s high unemployment rate is a critical issue that undermines the economic resiliency of the Community. Providing training and employment opportunities in growing resiliency related careers can address this issue. Substantial investment in building and infrastructure improvements to enhance resiliency is in demand across the city, but it is particularly needed in Red Hook itself. Connecting Red Hook residents—and youth in particular—to resiliency construction in Red Hook would not only increase access to employment, but could also grow a skilled local workforce to implement

resiliency improvements. Such improvements include building retrofits and larger infrastructure projects such as integrated flood protection.

The Proposed Project would provide workforce training in construction of resilient infrastructure or building improvements. The program would be administered by a local workforce development program and could be administered independently or in partnership with a community based organization (CBO), New York City Housing Authority (NYCHA), or other City agencies. Recruitment of applicants, provision of appropriate and



Brooklyn Workforce Innovation's Brooklyn Woods program is an example of a workforce program.
Source: Brooklyn Workforce Innovations

high quality instruction, establishing relationships with apprenticeship programs, and ensuring job placement are amongst the most challenging and critical functions that administrators would need to ensure.

The workforce training program would target resiliency construction in Red Hook. While building off of existing programs where appropriate and feasible, it would provide a curriculum tailored to the specific skills required for upcoming publicly funded projects. Instruction would be administered through both classroom and hands-on training. Skills taught by this program would include the technical skills needed for planned resiliency projects (such as integrated flood protection, a featured project within this NYRCR Plan) or for commercial and residential building resiliency retrofits. The program could also provide training in solar installation and electrical work in connection with the Committee's Proposed and Featured Projects to fund installation of solar-powered hallway lighting in Red Hook Houses.

Training opportunities may also exist in coordination with the "Section 3" mandate that requires that any project assisted by the U.S. Department of Housing and Urban Development (HUD) aim to have 30% of new hires be low-income individuals and/or residents of public housing.⁵ This provision has resulted in numerous employment and training opportunities including NYCHA's Resident Economic Empowerment and Sustainability (REES) program, which provides construction, janitorial, and other training opportunities to NYCHA residents resulting in long-term jobs. Especially given HUD's commitment

to local hiring, a training program could be developed in association with the proposed NYRCR infrastructure projects and funded with HUD CDBG-DR dollars.

Training residents for jobs that would exist when they graduate and persist in the long term is critical. By providing training in construction and building trades, with a specialty in resiliency, Red Hook residents can gain access to work that would likely continue to be in high demand, especially if extreme weather events continue to occur in the future.

Making Red Hook resilient in the long term requires both protecting physical assets and bolstering the social fabric of the neighborhood. Increasing the employment rate through workforce training connected to resiliency and recovery employment opportunities can help create a more economically inclusive and resilient community.

Cost

\$750,000

\$750,000 in CDBG-DR would fund a workforce development program. This estimate is based on precedent examples of existing workforce development programs of similar scope and scale, and would likely vary as the project is further developed and refined. The number of residents reached through the Proposed Project would depend on a number of factors including:

- Type of training provided (e.g., training for construction of integrated flood protection system versus training for resilient building trades)

- Length and depth of training provided
- Amount of “wrap-around” support services provided such as pre-program counseling, job placement support, and other services to support participants in development of soft skills
- Availability of matching funds by partnering organization or foundation

Analysis of existing workforce training programs reveals the range of services and costs different types of workforce programs may entail. Below are two illustrative high- and low-cost alternatives. The proposed workforce program would likely fall in between these two.

- **High cost, intensive workforce program.** For over \$20,000 per enrollee, full-time training for 18 weeks in building trades can be provided. Such a program would provide high quality instruction, extensive laboratory/hands-on training, small class sizes (less than 30 enrollees), enrollee outreach/recruitment, as well as wrap-around counseling services for pre- and post-training support and job placement.
- **Moderate cost, moderate intensity workforce program.** For around \$4,000 - \$7,000 per enrollee, from 5 to 10 weeks, basic construction training is provided full-time. Programs of this scale could provide basic training in a wide range of construction trades through classroom and laboratory training.

Benefits

Economic benefits

HIGH

The most notable benefits of the project are an increase in economic opportunity and social welfare in Red Hook. The proposed workforce training program would be of particular benefit to low-income youth as well as low-income adults. By recruiting and providing intensive training, the project would target at-risk youth/adults and position them to participate in careers in growing industries with opportunities for upward mobility. Within the Red Hook Planning Area the following vulnerable populations may benefit from this program:

- Unemployed residents: Approximately 3,000 residents (24% of the population) are unemployed.⁶
- Unemployed youth: In Red Hook Houses, 75% of 18-24 year olds are unemployed.⁷
- Low-income residents: Approximately 5,000 residents (38% of the population) live below the federal poverty line.⁸
- Residents with limited education: Approximately 5,000 Red Hook residents (37% of the population) over the age of 25 do not have a high school diploma.⁹

As training results in greater employment among Red Hook residents, the project would result in modest incremental spinoff economic benefits such as increased local spending.

This project would meet one of the key objective of the NYC Regional Economic Development Council’s Strategic Plan: fostering diverse and thriving neighborhoods by increasing employment opportunities in the neighborhood.

A workforce training program could result in a net reduction of costs by local government. Potentially, certain social aid expenditures would be reduced as a result of Red Hook residents gaining employment.

Health and social benefits

HIGH

As discussed in the economic development section, the project would have significant social benefits to the Community in the form of increased economic opportunity. This also has health implications, as people who are employed and more financially secure are more likely to be able to access health services they need. The program can have long-lasting economic and social benefits for those who participate in the program.

Cost-benefit analysis

The project would have direct and potentially transformational benefits for participants by increasing economic opportunity, and securing economic and social resiliency. It would also provide a local labor force that can implement resiliency projects.

The project demonstrates the Red Hook Community’s commitment to providing economic development opportunities for the neighborhood’s low-income residents. The aforementioned resiliency, equity, and economic benefits associated with this project are strongly aligned with some of the top priorities identified by the Committee and public, and justify relatively modest project costs.

There are no significant negative externalities associated with the proposed project. The cost-benefit of this project would evolve as the project is further refined.

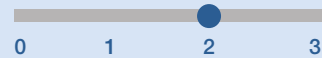
Risk reduction

LOW

The proposed project would not result in direct reduction of risk to assets that would not otherwise occur, but would provide indirect reduction of risk to physical community assets by way of training workers to implement projects that reduce risk.

A workforce training program also reduces risk to participating individuals and their immediate community by increasing the employment rate. Economic security ensures social resiliency in the aftermath of a disaster; Red Hook residents who can secure new income by participating this program would be more able to access the goods and services they need in a crisis.

Timeframe for implementation



Once the administering organization has been determined, the workforce development program could be launched within six to eight months. The selected organization should have proven experience and capacity administering workforce training programs in the construction trades. It is therefore expected that augmenting existing programs with resiliency skills or developing a new resiliency training track would be completed fairly quickly. As the program design is finalized, outreach to Red Hook residents would begin. The program administrator should have partners in Red Hook or experience conducting outreach in Red Hook—in particular amongst low-income/low educational attainment youth—in order to facilitate this process. The program itself would administer multiple training sessions over the course of one

or more years. The length and size of the program would depend on community priorities, what skills the market demands, and the administering organization.

Regulatory requirements

Depending of the type of training and certification required, the resiliency construction workforce training program may need to follow certain certification requirements. Should a workforce program be developed in partnership with NYCHA or seek to tie into certain Federal low-income population hiring requirements, additional regulations may apply.

Jurisdiction

The workforce program would be administered in Red Hook and would therefore come under the laws governing New York City workforce training and licensing.

Project Overview

Recovery Support Functions



Housing



Economic Development

Cost
\$1M

Risk Reduction



Health & Social Benefits



Economic Benefits



Timeline (years)



STRATEGY: INCREASE THE RESILIENCY OF EXISTING BUSINESSES AND PROMOTE OPPORTUNITIES FOR ECONOMIC DEVELOPMENT AND INCREASE THE PHYSICAL AND ECONOMIC RESILIENCY OF HOUSING

Local financial assistance for small businesses, start-ups, and homeowners/tenants

Proposed Project

This project would provide financial support to Red Hook small businesses and homeowners/tenants seeking to implement resiliency upgrades, as well as to entrepreneurs seeking to start micro-businesses. The program would be administered by a locally based organization, potentially with the involvement of a Brooklyn-based Community Development Financial Institution (CDFI).

Project description

Many commercial and residential buildings are at risk of flooding but owners and tenants are unable to pay for resiliency upgrades that would reduce their risk. The low penetration rate of past and existing financial assistance programs in Red Hook (including traditional bank loans as well as City, State, and Federal grant and loan programs) have elicited interest in locally administered financial assistance that can target financial products to individuals in need and can provide recipients with supportive services and information. Local commercial loans/grants could be supplemented by the previously mentioned New York City

Economic Development Corporation (NYCEDC) Business Resiliency Investment Program (BRIP). Loans/grants to homeowners/tenants could supplement NYC Build it Back and other programs.

Alternative financial mechanisms are also needed by microbusinesses and entrepreneurs to start businesses. Supporting this sector is essential to creating a more diverse and resilient local economy.



Small businesses, entrepreneurs, and homeowners/tenants need financial assistance to undertake resiliency upgrades.
Source: Jojo Demirel

The local loan and/or grant fund would provide financial assistance to Red Hook small businesses and homeowners/tenants seeking to implement resiliency upgrades, as well as to entrepreneurs seeking to start micro-businesses. The implementation of this program should be informed by analysis of the market and a subsequent determination

of what populations are in need of financial support and what tools would be effectively and actively utilized by selected populations.

The assistance program would market financial tools to Red Hook residents and business owners that need it most as well as provide technical assistance for accessing

these products. The Committee identified CDFIs as a potentially suitable type of partner because they serve market niches and populations underserved by traditional financial institutions, typically providing both financial tools and support services to recipients. There are also other potential local partners with capacity in grant administration that could be suitable to administer this program.

While further analysis would be needed to determine which financial tool is most appropriate for each sector, a variety of financial tools should be considered for the program. Loans and/or grants should be structured—as much as market conditions allow—to be accessible by individuals with limited financial resources. Wraparound services such as pre- and post-loan counseling and/or basic resiliency best practices information should be shared with financial assistance recipients. Further analysis would also be undertaken to confirm whether businesses, homeowners, tenants, and micro-businesses are all served through the program, or if only certain categories of these recipients would be targeted. Analysis would also be needed to determine if a revolving loan fund could become self-sustaining.

A loan or grant program would help businesses strengthen their buildings and operations in order to become more resilient, to avoid future economic losses, and to ensure access to critical goods and services in the event of another emergency. This program can also help homeowners to retrofit their homes to reduce risk and potentially lower their insurance premiums. A local program may generally also build local capacity and could potentially also link residents and businesses to resources.

Cost

\$1 MILLION

Approximately \$1 million is proposed for this program. This estimate is based on projects of similar scope and scale and would likely evolve as the project is further developed and refined.

The program would likely require operating expenses of approximately \$100,000 - \$200,000 to administer one or more funding pools through an existing organization. Annual operating costs for the grant/loan program would include the costs of one full time staff member to oversee outreach, manage applications, and provide counseling/technical assistance to recipients.

The cost for a resiliency grant or loan program could vary widely depending on what type of financial tool(s) were decided to be deployed (e.g., loan vs. grant vs. matching grant etc.), the size of loans/grants to be dispersed, and the number of clients targeted.

Assuming that basic resiliency needs for small businesses in Red Hook would range between \$6,000 - \$50,000 on average and between \$6,000 - \$20,000 for homeowners/tenants on average, this program could provide loans/grants to upgrade between 15 and 150 buildings in Red Hook.

Benefits

Economic benefits

HIGH

Notable economic benefits may result from a local loan/grant program. Such a project would increase the number of businesses and individuals able to access the financial support needed to undertake desired resiliency upgrades. Businesses participating in the program would be more resilient and therefore able to reopen more quickly after flood events, increasing their financial stability. The economic benefits resulting from provision of residential resiliency grants/loans could provide needed support to homeowners and tenants—helping them get back on their feet.

Such a program supports the NYC Regional Economic Development Plan's objective of supporting small businesses and start-ups and retaining vibrant neighborhood and commercial districts.

A local loan/grant program would have a positive effect on local government expenditures. By providing financial assistance to help homeowners and businesses undertake resiliency upgrades, damage and associated public costs would be lessened and demand for existing city financial resources may be lessened.

Health and social benefits

MEDIUM

A local grant/loan fund would have significant social benefits—it could provide certain populations that have been underserved by traditional loan or grant programs

with access to financial tools and, therefore, greater financial stability. In particular the following populations within the Red Hook Planning Area may benefit:

- Low-income population: Approximately 5,000 residents (38% of the population) live below the federal poverty line.¹⁰
- Small businesses: 67% of Red Hook businesses have five or fewer employees.¹¹

Cost-benefit analysis

There is a substantial need for additional financial support for resiliency upgrades for both residential and commercial clients that are unable to secure funding through existing financial entities and programs. The benefits of providing financial support to 15-150 buildings in Red Hook are reasonable for a \$1 million price tag. Particularly if funds were to be disbursed through a loan over the course of many years, more buildings could be served and potentially a self-sustaining local loan pool may emerge from this program. This project addresses the Planning Committee's focus on promoting equity and opportunity across all sectors of the Community.

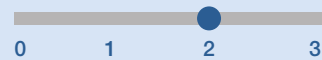
Risk reduction

MEDIUM

Such a program would indirectly reduce risk—by enabling homeowners and businesses to undertake resiliency upgrades, more buildings would be flood-proofed. As such, this program could reduce risk for a number of commercial

and residential assets. The program would also thereby reduce risk for residents, as well as for business owners and workers relying on commercial assets.

Timeframe for implementation



Once the administering entity has been selected, the proposed project could be launched within six months. The loan/grant pool funds could be disbursed over the course of one year with proper outreach and targeting. A revolving loan fund may be able to persist beyond disbursement of the initial loan pool funds as loans are repaid with interest. The potential for this would depend heavily on the management of the loan pool and the terms of the loans.

Regulatory requirements

Financial assistance provided by a local CDFI or other organization would face minimal regulations and requirements. CDFI certification is conferred by the U.S. Department of Treasury's CDFI Fund. Nonprofit organizations may administer grants without significant oversight.

Matching funds and private/foundation money could be pursued for this project and could introduce additional regulatory requirements.

Jurisdiction

The proposed project would be deployed in Red Hook and would therefore fall under the jurisdiction of New York City.



Source: Jojo Demirel



Source: Jojo Demirel

Project Overview

Recovery
Support Functions



Infrastructure



Housing

Cost

Phase I: \$100,000

Phase II: \$1M

Risk Reduction

MEDIUM

Health & Social Benefits

HIGH

Economic Benefits

MEDIUM

Timeline (years)



STRATEGY: INCREASE THE PHYSICAL AND ECONOMIC RESILIENCY OF HOUSING

Solar-powered emergency lights for Red Hook Houses stairwells

Phase I: Pilot for two to three buildings in Red Hook Houses (Proposed Project)

Phase II: Full implementation in Red Hook Houses (Featured Project)

This project would fund the implementation of solar-powered emergency lighting in Red Hook Houses and result in opportunities for job creation (and training) for solar panel installation, operations, and maintenance. Phase I would provide a pilot project for two or three buildings in Red Hook Houses, and Phase II would complete implementation for the remaining buildings in Red Hook Houses. This project would provide backup lighting when the main grid fails, ensuring the safety and mobility of residents.

Project description

Following Superstorm Sandy, buildings within Red Hook Houses, a New York City Housing Authority (NYCHA) public housing development, were afflicted by prolonged power outages. Lack of light in the stairwells created a safety issue for residents. The provision of a resilient lighting source in shared spaces at Red Hook Houses during and after an emergency would support both safe evacuation and returning to life as normal.

This project would purchase and install solar panels and back-up batteries on the roofs of Red Hook Houses residential buildings thereby providing an alternative power source for the stairwell lights in the event of a power outage. Phase I of this project would provide Community Development Block Grant – Disaster Recovery (CDBG-DR) funds to establish a pilot in two or three typical buildings in Red Hook Houses. Pending successful implementation of Phase I, it is recommended that funding be secured for Phase II, which would include expansion of the pilot to all 30 buildings in Red Hook Houses.

How it might work



The Red Hook Houses are a strong candidate for solar power with ample roof space to accommodate panels and backup batteries—often a challenge in other locations. Taller than surrounding buildings and vegetation, the roofs likely offer good sun exposure. Design and implementation would need to address protection of outdoor equipment during and after a storm. Solar power for such a targeted function is a highly feasible, sustainable and low-maintenance power generating option as evidenced by the growing use of solar power as an alternative energy source. In New York City alone, there are more than 1,000 solar installations on a variety of building types, including residential buildings. There is a large-scale example of solar power generation in Red Hook at the IKEA store, which has an annual output of 238,000 kilowatt hours.¹²

Cost

Phase I (Proposed): \$100,000

Phase II (Featured): \$1 MILLION

Approximately \$100,000 would support implementation of a solar-powered emergency lighting system in two to three of the buildings within the development. This estimate includes all equipment, labor, installation, engineering, permitting, and warranty for a combined solar PV system and a battery system, tied to the buildings' existing electrical system. The costs for specific-sized systems are interpolated from standard system costs. The overall cost estimate is based on engineer experience with projects of similar scope and scale, and the cost has not been adapted to specific local conditions. It is conceptual and would likely vary as the project is further developed and refined.

Pending successful implementation of the solar installation pilot (Phase I), it is recommended that funding be secured for expansion of the pilot to all 30 buildings comprising Red Hook Houses (Phase II). The total cost for this subsequent work would be approximately \$1 million. Alternative funding sources for this would need to be secured.

There would be some additional operations and maintenance costs for NYCHA staff or another party contracted to maintain the system, but generally, solar panels are relatively low maintenance in comparison to other power supply systems.

Benefits

The following discussion of benefits considers the long-term implementation of solar-powered emergency lights for the stairwells of all buildings in Red Hook Houses (Phase II) in addition to the two or three buildings that would be included in the pilot project (Phase I).

Economic benefits

MEDIUM

This project could result in opportunities for job creation (and training) for solar panel installation, operations, and maintenance. This is particularly true in Red Hook, where organizations such as the Red Hook Initiative are already engaged in skills training around technology installation and maintenance. Moreover, there is an organization—Solar One—that is based in Manhattan and trains people throughout New York City in solar installation. Therefore, there would be a strong opportunity for this project to tie into existing job skills training programs in the neighborhood as well as other projects proposed by the Committee (see

“Resiliency construction workforce training”). Solar power combined with battery-based storage is expected to grow as an industry over the coming decades as costs come down and regulations change.

Additionally, through the use of solar power, this project would be closely aligned with the goals of the New York City Regional Economic Development Council’s Strategic Plan, which calls for a more diversified energy generation and distribution system. Furthermore, while solar panel installation could result in high upfront costs, there would be financial incentives available through the New York State Energy Research Authority (NYSERDA) and other organizations to help offset this cost to the owner and operator of the project. Moreover, the use of solar power would reduce energy costs paid to Con Edison if the solar lighting is utilized on a more regular (non-emergency) basis.

Health and social benefits

HIGH

This project would result in health and social benefits by serving the socially vulnerable population of Red Hook Houses, including low-income households with limited resources and seniors. While the problems of power loss in Red Hook are more widespread than lighting alone, the immediate restoration of power to this critical system would help enable vulnerable public housing residents to safely evacuate if needed and to move freely and safely to and from their homes to access goods and services after an emergency. Lighting would also be able to support more efficient delivery of services to residents in their apartments. In particular, sick or disabled tenants

would be able to leave their apartments and get help in the aftermath of a natural disaster or more easily have assistance come to them. Lighting could also improve the perception of safety and reduce the incidence of crime.

Environmental benefits

MEDIUM

If, in addition to its emergency function, the solar lighting would be used on a more regular basis, this project would provide environmental benefits, as solar power is a renewable and pollution-free energy source. The use of solar power would reduce the use of electricity procured from traditional power plants, which are a major source of air pollution in the region.

Cost-benefit analysis

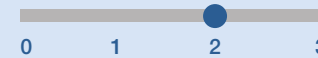
The proposed project would result in a wide range of benefits for Red Hook Houses buildings and tenants. These benefits would take the form of reducing vulnerability of Red Hook Houses residents, but also providing development-wide and even potential community-wide economic and environmental co-benefits. These benefits would be sustainable over the 25+ year useful life of the solar panels. Additionally, as a pilot project for NYCHA, this project would be replicable at a large scale and, if successful, could be used to guide implementation of similar emergency lighting in housing across the City. Therefore, the far-reaching benefits would justify the cost of this project.

Risk reduction

MEDIUM

The project would reduce Red Hook Houses' vulnerability to power failure by providing an alternative power source for the stairwells when the electric grid is not functioning during and/or after an emergency. Stairwell lighting would improve mobility and decrease risk of accidents for the 5,654 residents of Red Hook East and 864 residents of Red Hook West.¹³ The risk reduction benefits of this project would not be limited to coastal flooding emergencies and would be effective in the face of any emergency resulting in power outages, including events such as brown-outs, which would occur more frequently in the future.

Timeframe for implementation



The design and installation of solar panels for the pilot building in Phase I would likely be completed within one year, at which time implementation would be considered for the remaining buildings in Red Hook Houses development (Phase II).

Regulatory Requirements

Implementation would require coordination with NYCHA. It would also require permitting from the New York City Department of Buildings (NYC DOB) and coordination with several additional entities, including the Fire Department of New York (FDNY), Con Edison, and the Bureau of Electrical Control.

Jurisdiction

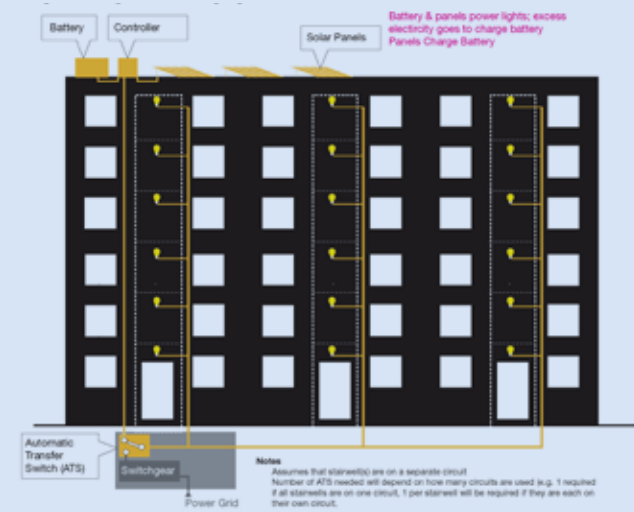
Red Hook Houses are owned and operated by NYCHA on New York City property.

How it might work

Connected to the grid



Powered by solar



Project Overview

Recovery
Support Functions



Infrastructure



Housing

Cost

\$300,000+

Risk Reduction



Health & Social Benefits



Economic Benefits



Timeline (years)



STRATEGY: CREATE OPPORTUNITIES FOR ALTERNATIVE AND/OR REDUNDANT POWER GENERATION AND DISTRIBUTION

Red Hook Houses Microgrid

Phase I: Feasibility study (Proposed Project)

Phase II: Implementation (Featured Project)

This project would fund a study (Phase I) to assess the feasibility of implementing a microgrid with a local energy source that could provide backup power for Red Hook Houses—home to more than 50% of the Red Hook Community—during an emergency. Pending the findings of the feasibility study, it is recommended that additional funding be secured to pursue implementation (Phase II).

Project description

New York City Housing Authority (NYCHA) Red Hook Houses suffered long-term loss of power in the wake of Superstorm Sandy due to disturbances to the regional power distribution system and vulnerability of the on-site equipment to flooding. The need for resilient alternative power sources when the regular grid is out of service exists throughout the neighborhood, but Red Hook Houses is home to over 50% of Red Hook residents and the buildings are particularly vulnerable.

This project would evaluate the feasibility of creating a microgrid powered by a local energy source (most likely cogeneration) to ensure power resiliency for Red Hook Houses.

The study would consider service to residential units in Red Hook Houses as well as the potential addition of the Miccio Community Center to the microgrid. The study would assess the suitability of various local energy sources, including natural gas fired cogeneration, emergency generators, wind, or solar energy, and their ability to be used during emergency power events. The expected outcome of the study would include detailed cost estimates for alternatives studied.

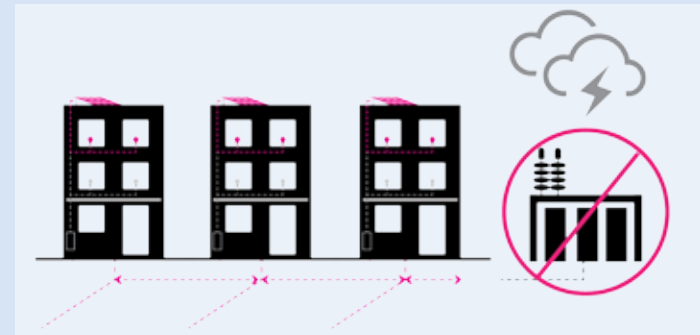
Specifically, the study would:

1. Investigate the existing rates of electricity and gas utilization for Red Hook Houses

2. Determine the necessary sizes of all basic equipment for a cogeneration facility to serve Red Hook Houses
3. Assess the feasibility of establishing a microgrid tie-in to the electric distribution system
4. Engage Con Edison to determine if the utility provider would permit a microgrid tie-in for Red Hook Houses
5. Conduct a site-suitability assessment to determine potential locations for the cogeneration facility

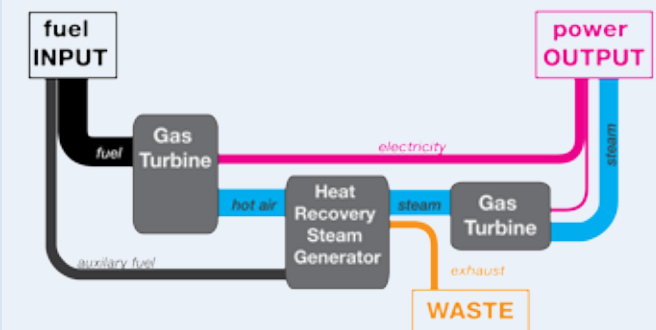
Pending the findings of the feasibility study (Phase I), additional funding should be secured to pursue development of a microgrid powered by a local energy source for Red Hook Houses (Phase II). While future funding sources have not yet been identified, the opportunity to support this key first step through the NYRCR Program could leverage other investments and engage key partners.

The feasibility study (Phase I)—proposed using a portion of the available Community Development Block Grant – Disaster Recovery (CDBG-DR) funding—would proactively address foreseeable challenges for implementation, should future funding sources be identified to pursue implementation (Phase II). These challenges include: identification of an appropriate site for a cogeneration facility (e.g., ownership/contractual issues as well as physical/environmental issues); identification of sufficient space within buildings for implementation (especially with fuel tanks, if required); the need for replacement of existing electric equipment to accommodate cogeneration and microgrid technologies; coordination with NYCHA, Con Edison, and the Public Service Commission (PSC);



What is a Microgrid?

A microgrid is a portion of the larger electrical grid that can be disconnected from the rest of the grid during an emergency, provided there is enough local power generation to meet necessary loads. The microgrid can therefore act as a self-sufficient unit when the larger grid is compromised.



What is Cogeneration?

The most established and commonly used power source for a microgrid is cogeneration, which uses a fossil fuel-powered engine to simultaneously produce electricity and heat. This is more efficient than purchasing grid power and natural gas/oil separately!

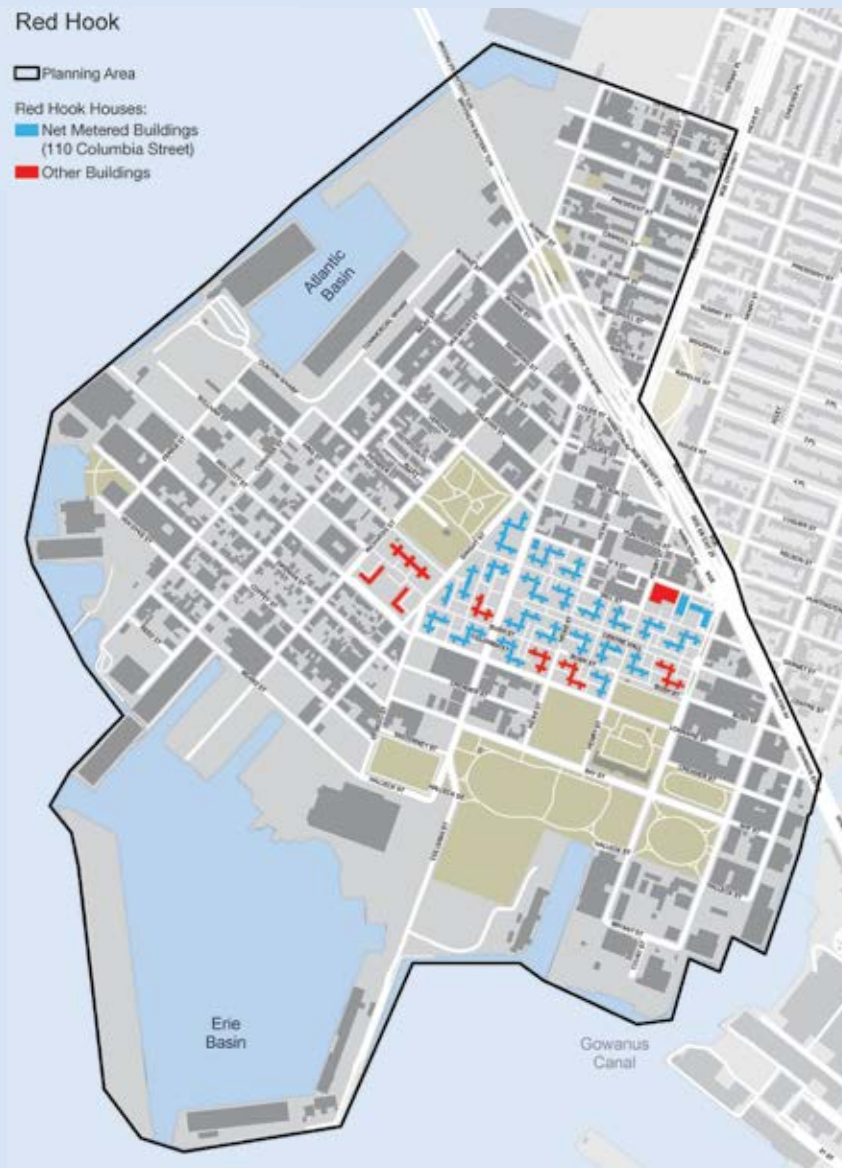
regulatory and legal issues related to combining electric service across multiple NYCHA properties in the area to produce the appropriate microgrid; and the risk of losing natural gas in emergencies.

The Red Hook Houses development is a strong candidate site for implementation of a microgrid. Twenty-five of the existing buildings are already metered as a single unit (i.e., 110 Columbia Street, according to the NYC 2012 Energy and Water Data Disclosure), minimizing many regulatory hurdles in implementing such an off-the-grid power source.¹⁴ In addition, centralized ownership under NYCHA, potential availability of a suitable site for power generation facilities, the vulnerability of many residents, and the fact that approximately half of all neighborhood residents live in Red Hook Houses, mean that a microgrid on this site could maximize the benefits of this investment. Additionally, there is growing interest and support at the City and State level for alternative energy and microgrid opportunities. While there are currently no precedents for the combination of electric service across multiple NYCHA properties, NYCHA is already considering similar approaches to energy for its facilities. As noted in New York City's Proposed Amendment 5 to its CDBG-DR Action Plan, NYCHA anticipates implementing "advanced restoration measures" that may exceed \$50 million to improve resiliency including cogeneration (in addition to façade improvements).¹⁵ In Coney Island, NYCHA is

"exploring the feasibility of combining 10 boiler plants for three impacted developments into one centrally located combined heat and power plant that would provide centralized heating and emergency backup power to more than 2,000 residents."¹⁶

Furthermore, there are precedents for cogeneration in existing affordable housing developments in New York City. One of the largest and most well-known examples is Starrett City (Spring Creek Towers), which contains nearly 6,000 apartments and was developed under the Mitchell-Lama Housing Program to provide affordable apartments to middle-income residents. Similarly, the Rochdale Village Housing Complex, comprised of 20 buildings in southeastern Queens, has a cogeneration facility that generates power for the entire development. These precedents all speak to the growing interest, feasibility, and viability of local power generation options for large-scale residential developments in New York City.

This project would also contribute to the goals of Governor Cuomo's recently unveiled infrastructure strategy, "Reimagining New York for a New Reality," which calls for a resilient energy system and the creation of microgrids across New York State (albeit at a larger scale for entire communities with approximately 40,000 residents).

Figure IV-2: Net-meter buildings in Red Hook Houses

Cost

Phase I (Proposed): \$300,000

Phase II (Featured): \$50-500 MILLION

The cost for conducting the feasibility study would be approximately \$300,000. This cost estimate is based on engineer experience with projects of similar scope and scale and has not been adapted to specific local conditions; it could vary as the project is further developed and refined.

While a broad cost range has been provided, total costs for the subsequent work to develop a local microgrid powered by a local energy source is unknown at this time as greater definition of the size, design and operation of the system is needed to provide even a conceptual level cost. A cost for implementation would be determined as part of the proposed feasibility study.

Benefits

If the proposed study results in positive findings for the feasibility of a microgrid and power facility for Red Hook Houses, the eventual implementation of this project would result in benefits for much of Red Hook Houses, a key asset in the Community and home to about half of the residents in the Community. The following discussion of benefits considers the long-term implementation effects of the microgrid/power facility (Phase II) in addition to the study itself (Phase I).

Health and social benefits

HIGH

If implemented, this project would result in health and social benefits by serving the socially vulnerable populations of Red Hook Houses, including low-income households and seniors with few resources. Having electrical power during a broader blackout would also create opportunities for NYCHA residents to take care of their neighbors, deepening social ties. In addition to the residential units served, the project would enable the health and social service asset of the Miccio Community Center (if included in the microgrid) to continue operations and support to community members during acute events.

Economic benefits

MEDIUM

This project would be consistent with the goals of the New York City Regional Economic Development Council's Strategic Plan, which calls for a more diversified energy generation and distribution system.

Furthermore, if implemented, the project could also lead to modest opportunities for job creation (and training) for the upfront construction and ongoing operations and maintenance of a power production facility. Additionally, cogeneration with a microgrid tie-in for Red Hook Houses would create opportunities for financial savings for NYCHA due to potential lower gas and power costs for cogeneration.

Environmental benefits

MEDIUM

There are several technologies for local power production that have less environmental impact than the power that currently feeds Con Edison's grid. Cogeneration technologies significantly increase efficiency over the separate production of power and heat. Renewable power sources would also be studied as viable options for these facilities. Therefore, if implemented, there would likely be lower adverse impacts to the environment in terms of pollution.

Cost-benefit analysis

This project would result in a wide range of benefits, including risk reduction benefits for Red Hook Houses buildings and tenants, as well as opportunities for economic, environmental, and health and social benefits. The feasibility study would assess the sustainability of these benefits, the extent to which implementation would result in any negative externalities or opportunity costs, and the likely useful life of a cogeneration facility (or other alternative power generation source) to serve Red Hook Houses. Therefore, the potential far-reaching benefits would justify the cost of the proposed feasibility study, which would be a necessary precursor to implementation.

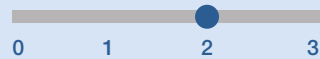
Risk reduction

MEDIUM

If implemented, a microgrid powered by a local energy source would allow connected residential units to access power even when the larger electric grid is not functioning,

thereby resulting in decreased vulnerability to power loss to some or all of the buildings that comprise Red Hook Houses. The project would also reduce risk to the buildings' tenants. A lack of power can impact residents in a number of ways: spoiling food in non-functional refrigerators, increasing the potential for crime, and increasing vulnerability for disabled and elderly populations.

Timeframe for implementation



The feasibility study (Phase I) would be completed within one year, at which time the focus would shift to potential implementation (Phase II), pending the findings from the study.

Regulatory requirements

There are no regulatory review requirements for a feasibility study, but there would be necessary coordination between NYCHA, Con Edison, and the PSC. However, the actual construction of a microgrid and energy production plant would involve permits from many regulatory bodies, including the New York City Department of Buildings (NYC

DOB), the New York State Department of Environmental Conservation (NYS DEC), the Fire Department of New York (i.e., space restrictions for tanks/gas), Con Edison for electric, National Grid for gas, PSC, and the Bureau of Electrical Control.

Jurisdiction

Red Hook Houses are owned by NYCHA on New York City property. Depending on the findings of the feasibility study, implementation of a microgrid with a local energy source could also include working within public streets, operated by the NYC Department of Transportation (NYC DOT), and could also include private property that is adjacent to Red Hook Houses.



At the time of writing, some buildings in Red Hook Houses still use a backup boiler. A microgrid could provide an opportunity for more resilient energy generation.

Project Overview

Recovery Support Functions



Infrastructure



Economic Development

Cost

\$500,000+

Risk Reduction

MEDIUM

Health & Social Benefits

MEDIUM

Economic Benefits

HIGH

Timeline (years)



STRATEGY: INCREASE TRANSIT CONNECTIVITY AND REDUNDANCY TO FACILITATE EVACUATION AND REBUILDING

New ferry landing and additional ferry service

Phase I: Construct a ferry landing at or near Atlantic Basin (Proposed Project)

Phase II: Subsidize operation of a new or existing ferry route to Red Hook (Featured Project)

This project would fund construction of a new ferry landing at or near Atlantic Basin (Phase I), contingent on a commitment of matching funds by a private/public entity to ensure completion of the ferry landing. It is recommended that additional funding be secured to subsidize a new or existing ferry route to Red Hook (Phase II).

Project description

With only two bus lines, a subway that is more than a 20-minute walk from most locations, and a ferry service limited to afternoon trips to and from IKEA, the residents and employees of Red Hook are currently underserved by public transit and have limited travel options year-round as well as before, during, and after an emergency.

This project would fund construction of a new ferry landing at or near Atlantic Basin (Phase I), using a portion of the available Community Development Block Grant – Disaster Recovery (CDBG-DR) funding, and contingent on a commitment of matching funds by private and/or public

partners to ensure completion of the ferry landing. The ferry landing would be constructed in a resilient manner in order to ensure that it could quickly return to operation after a flooding event to accommodate rescue and relief efforts, and to quickly return back to normal service. This would align with the Planning Committee's general support of citywide waterborne emergency transportation planning. The Committee recommends additional funding be secured to subsidize a new or existing ferry route to serve Red Hook (Phase II), potentially in coordination with the City and private property owners.



The image shows a possible location for construction of a new ferry landing, as suggested by the Committee. This site provides proximity to Van Brunt Street retail corridor and could help activate Atlantic Basin.

There are several advantages of Atlantic Basin over other potential ferry landing locations—such as the foot of Van Brunt Street or Valentino Pier—including its accessibility due to its location at the midpoint of the Red Hook peninsula, as well as the potential to promote activation of the area and integration of the uses in the vicinity of Atlantic Basin, the Brooklyn Cruise Terminal, and the Pier 11 shed space.

Securing a funding match for construction of the landing would be necessary and a subsidy for operating costs would be needed. Examples of existing ferry subsidies, as noted in the Preliminary Report of the 2013 *Comprehensive*

Citywide Ferry Study (2013), include a \$2.22 subsidy per passenger trip for the East River Ferry (with a fare of \$4)—which is close to the \$2.20 subsidy per passenger trip for New York City Transit buses—and a \$4.86 subsidy per passenger trip for the Staten Island Ferry, which is free for passengers.¹⁷

The Rockaway ferry service can be viewed as a precedent for this project, demonstrating the City's past support for increasing ferry service to transportation-poor communities affected by Superstorm Sandy and illustrating how the provision of ferry service could be rolled out. Temporary weekday service from the Rockaways to Pier 11/Wall Street

was launched by New York City Economic Development Corporation (NYC EDC) in the aftermath of Superstorm Sandy in November 2012, and a stop at the Brooklyn Army Terminal in Sunset Park was added in November 2013. Service was intended to end in January 2014, but was extended by New York City Mayor Bill de Blasio to May 2014, and a Request for Proposals (RFP) would be issued to determine the viability of permanent service and to identify an operator.¹⁸ However, it is worth noting that the future of the Rockaway ferry service is uncertain at this time.

Supporting capital and operating costs for the proposed and featured project could be appealing to both public and private interests interested in promoting economic development in the area, and local property owners could be interested in supporting enhanced ferry service due to the increase in value this may confer on their properties. Site-specific analysis at Atlantic Basin would be required to accurately project the capital cost of a new, resilient ferry landing. Additional research into market demand for ferry service would also be required in order to determine a preferred route, to identify a viable level of service, and to size the operating subsidy that would be needed. Securing funding would require outreach and communication of this information to property owners of existing and potential future ferry landing sites—including NYC EDC and private landowners—as well as existing ferry operators.

Cost

Phase I (Proposed): \$500,000

**Phase II (Featured): \$2.5-5.0 MILLION
ANNUALLY**

\$500,000 would contribute to the construction of a new ferry landing at Atlantic Basin, contingent on commitment of matching funds by private and/or for public partners to ensure completion of the landing. Based on NYCEDC's report entitled *Ferry Policy and Planning in New York City: Considerations for a Five-Borough Ferry System* (2013), the total cost of a ferry landing could be as much as \$2 million to \$7 million, depending on factors such as water depth, soil and shoreline conditions, and access to utility infrastructure such as power, in addition to other considerations such as shoreline access, the provision of supporting amenities such as passenger shelters and ticketing infrastructure, and the required time and costs for design and permitting. The conceptual-level cost estimate was developed based on current unit pricing and typical soft cost assumptions. Cost estimates would continue to be refined as more information is developed about the project.

Pending successful development of a new ferry landing (Phase I), additional funding should be secured to subsidize a new or existing ferry route to serve Red Hook (Phase II), potentially in coordination with the City and private property owners. The cost range provided for the annual operating subsidy is based on findings from NYC EDC's 2010 Citywide Comprehensive Ferry Study (2010),

and specifically route options that include service along the Brooklyn waterfront (i.e., the South Brooklyn route and the East River – Brooklyn and Queens route). These subsidy numbers are preliminary estimates and were developed based on the potential route options identified as part of the study. The actual subsidy that would be required for Phase II of this project cannot be determined without identifying the actual route as well as fare structure, frequency of service, ridership estimates, and other factors. A series of other route options, operating alternatives, potential partners, and strategies to increase ridership that could influence the annual operating subsidy have been suggested and discussed as part of the NYRCR planning process. Thus, this cost range should be taken as a gross estimate only, and significant further planning and study would be required to develop an actual cost.

Benefits

The following discussion of benefits considers the construction of the new ferry landing at or near Atlantic Basin (Phase I) as well as the implications of long-term enhancements to ferry service in Red Hook (Phase II).

Economic benefits

HIGH

Considerable economic benefits could result from expansion of regular ferry service to Red Hook to a new, more conveniently located ferry landing at or near Atlantic Basin. More frequent ferry service would yield reduced travel time for commuters from Red Hook to their jobs. The 2010 Citywide Comprehensive Ferry



Study (2010) indicated that ferry service could reduce commuting time for Red Hook residents by 30-35 minutes for those who commute to Lower Manhattan, and by 10-20 minutes for those who commute to Midtown Manhattan.¹⁹ Ferry service would provide not only a faster option for commuters, but a transportation mode that is popular with visitors. Regular ferry service connecting Red Hook to Lower and Midtown Manhattan, Governors Island, and other activity centers would improve quality of life for Red Hook residents and help drive economic development by drawing more visitors to Red Hook year-round. The project would contribute to the New York City Regional Economic Development Council's Strategic Plan, which cites ferry service as an important intra-city transit option.

The addition of a ferry landing with service to and from Atlantic Basin would attract both residents and visitors to the waterfront off Buttermilk Channel, perhaps encouraging more businesses to locate there and at sites that connect the new landing to the Van Brunt Street commercial corridor. The East River Ferry can be cited as a local example of economic development directly linked to the provision of ferry service. Specifically, the East River Ferry induced measurable economic development in Brooklyn and Queens, with 7.2% residential growth and 4.2% retail growth within a quarter mile of the ferry stops, and an 8% growth in housing values within an eighth of a mile of the ferry stops, although it is worth noting that this coincided with construction under the Williamsburg waterfront rezoning.²⁰

Construction of the ferry landing would also likely result in the creation of a modest number of temporary construction jobs.

Environmental benefits

MEDIUM

In the long term, this project, by providing an additional transit option for Red Hook residents, workers, and visitors, could help reduce automobile use and reduce pollution, although there could be environmental externalities associated with increased operation of ferries. Construction of the new landing would have some adverse environmental effects but these could be mitigated through utilization of sustainable building methods.

Health and social benefits

MEDIUM

If ferry service to Red Hook is increased, a number of health and social benefits could be felt by the Community. Improved accessibility and connectivity to locations in Manhattan, including regional health and social services facilities, could benefit many residents. This is important because many Red Hook residents state that there is a lack of nearby health and social service facilities in the neighborhood. A new ferry landing and increased ferry service would increase the connection with the waterfront and could result in investment into waterfront public spaces, which could have social and health benefits to visitors and residents.

Cost-benefit analysis

The project would result in a wide range of benefits, including risk reduction benefits for the residents of Red Hook during emergencies, as well as economic, environmental, and health and social benefits during year-round operations. The benefits would be sustainable for as long as the ferry operating support remains in effect. An environmental review would be necessary to identify and evaluate the impact of any negative environmental externalities associated with the project. To achieve a comprehensive understanding of the cost-benefit, a greater definition of the service operation and other available funding sources for the project would be needed.

Previously studied and discussed ferry routes

1. Add morning service to IKEA route
2. Extend the East River Ferry to Red Hook
3. Add a stop in Red Hook on the existing Rockaways-Sunset Park-Manhattan route
4. Break the current Rockaway route into a Rockaways-Manhattan route and a Sunset Park-Red Hook-Manhattan route
5. New route - NYCEDC Comprehensive Citywide Ferry Study, Route 1
6. New route - NYC EDC Comprehensive Citywide Ferry Study, Route 1b



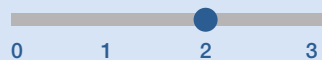
Risk reduction

MEDIUM

In addition to providing better connections with the rest of the City, ferry service is a highly resilient method of transportation—if landings are built correctly—because it requires little other hard infrastructure. For example, East River Ferry service resumed just 36 hours after Sandy, while most of the subway system was still inoperable due to track flooding and other damage to the complex and enormous infrastructure system.

Enhanced passenger ferry service would add redundancy to the transportation system by providing an additional option for travelers, a vital resource during and after emergencies when other transportation modes are compromised. An additional ferry landing and expanded ferry service would provide an additional evacuation and supply delivery option prior to and following disasters, thereby reducing vulnerability of the residents and workers in Red Hook, and also enabling faster recovery following disasters.

Timeframe for implementation



The timeframe for implementation would be dependent upon a number of factors, including but not limited to the ability to secure funds from public and/or private entities to match the proposed \$500,000 allocation for construction of a new ferry landing, as well as identification of additional funding to subsidize operations. Additionally, potential

challenges for quick implementation would include navigating the fragmented governance and operational structure for ferry service in New York Harbor, as detailed in the 2010 Comprehensive Citywide Ferry Study (2010). As highlighted in the Ferry Policy and Planning in New York City (2013) report, there are also lengthy environmental and permitting processes that are necessary to construct a new ferry landing. However, it is already possible for ferries to use Atlantic Basin for special events (e.g., “The Taste of the NFL” event during the 2014 Super Bowl weekend), which could help to curtail the timeline for implementation.

Regulatory requirements

As discussed in the *2010 Citywide Comprehensive Ferry Study*, there are a number of regulatory requirements that involve coordination with City, State, and Federal agencies. The New York State Department of Environmental Conservation (NYS DEC) is responsible for approving ferry facility permits, the U.S. Army Corps of Engineers is responsible for approving in-water permits, the New York State Department of Transportation (NYS DOT) is responsible for operator licensing, and the New York City Department of Transportation (NYC DOT) is responsible for the granting of landing licenses.

Additionally, since Atlantic Basin is located within the coastal zone, the project would be subject to review for consistency with the New York State Coastal Management Program and the New York City Waterfront Revitalization Program (WRP). The New York City Approved Revisions to the WRP designates Atlantic Basin as part of a Priority Marine Activity Zone (PMAZ), and this is noteworthy because (according to the WRP) actions that affect the

design of shoreline structures, in-water structures, and other pieces of infrastructure within such PMAZs should prioritize designs that accommodate water-dependent uses for purposes of maintaining the City's waterborne transportation network. The explicit purpose of this project would be to enhance the waterborne transportation network by constructing a ferry landing and providing service to Atlantic Basin.

Jurisdiction

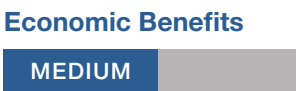
Ferry operations in New York City fall under the jurisdiction of a number of different entities, including the New York State Department of Environmental Conservation (NYS DEC), the U.S. Army Corps of Engineers, and the New York State and New York City Departments of Transportation.

Project Overview

Recovery
Support Functions



Cost
\$500,000



STRATEGY: IMPROVE DRAINAGE AND REDUCE FLOODING FROM SEWER BACKUP

Red Hook drainage study

Proposed Project

This project would fund a study to analyze the existing conditions that contribute to frequent flooding in Red Hook. The proposed project would not fund a New York City Department of Environmental Protection (NYC DEP) study, but rather would fund a study conducted by a third party. By uncovering unknown details of existing conditions, the study would identify specific measures to improve drainage in the neighborhood.

Project Description

Low-lying Red Hook frequently experiences flooding during heavy rain events. Red Hook receives stormwater runoff from adjacent neighborhoods and suffers from issues associated with a high water table. Flooding of low-lying areas and basements during and after heavy rain events is a frequently occurring problem, and regular flooding creates recurring costs and inconvenience for property owners, businesses and residents. Solving drainage problems is therefore a critical priority. However, further analysis of the specific conditions leading to flooding in particular locations would be necessary to develop solutions and mitigation measures.

The purpose of the proposed study would be to gather information about the causes of recurring drainage problems in Red Hook and to identify potential targeted solutions to these problems. The proposed study should be coordinated with the Brooklyn Greenway Initiative’s ongoing work to develop stormwater design guidelines for the Brooklyn Greenway, and investigate the existing sewer, stormwater and groundwater conditions in Red Hook to better understand the type and extent of recurring drainage issues and identify their likely causes. Components of the study would include:

Figure IV-4: Reported drainage complaints



- A high-level review of information made available by the City and analysis undertaken as part of the NYRCR planning process to prioritize problem areas and identify specific problem site(s)
- A more in-depth study by professional engineers and hydrologists to analyze existing drainage and groundwater conditions at a specific site or sites with acute problems
- Recommendations for a suite of interventions and projects that might be undertaken to address problems identified by the study, both by public agencies and local property owners

While the Planning Committee has recommended such a study be conducted by a third party, full coordination with NYC DEP would be necessary to complete the study, including provision of existing sewer conditions information. Conversation with NYC DEP would be required to determine the feasibility and implementability of any recommendations made.

Pending the findings of the drainage study and their publication and provision for broad access by the Community, the Planning Committee recommends securing additional funding sources and coordinating with NYC DEP to undertake drainage/sewer system improvement project(s) in Red Hook. Additionally, there may be opportunities and recommendations for projects that can be undertaken by property owners to improve drainage conditions on privately owned properties.



Flooding is chronic in certain areas. The above image was taken in 2007 after a heavy rain event. Source: Carolina Salguero

Cost

\$500,000

Approximately \$500,000 would cover the activities described above, but the level of detail, as well as the number and size of sites that could be studied within this budget, would need to be determined at the time of the study and based on review of existing information with NYC DEP. The cost represents a conceptual estimate of the probable cost.

Pending the findings of the drainage study, the Planning Committee recommends securing funding and coordinating with NYC DEP to undertake drainage/sewer system improvement project(s) identified in the study. It is

possible that other funding sources could be identified to provide financial assistance for the implementation of the project such as through the NYS Environmental Facilities Corporation (NYS EFC). Total costs for this subsequent work cannot currently be estimated as they are contingent on the findings of the study and the scope of the work required.

Benefits

Economic benefits

MEDIUM

Because the study would help to identify and site projects to reduce stormwater runoff into the existing system, it could create opportunities to reduce or delay the need for other sewer system capacity improvements. In this way, the study could create opportunities to achieve a positive net effect on local government expenditures.

Drainage improvement projects that would be recommended through this study could also create opportunities to reduce costly damages to commercial, industrial, and residential buildings caused by recurring flooding.

Environmental benefits

MEDIUM

Depending on the specific projects recommended by the proposed study, implementation of targeted drainage improvement projects could create opportunities to improve water quality through better management of stormwater runoff and potential reduction of combined sewer overflow (CSO) events in which the combined storm

and sanitary sewer gets discharged into a local water body. The details of the potential environmental benefits are unknown at this time.

Cost-benefit analysis

The drainage study would be a relatively small investment with high potential to set the stage for future drainage projects by identifying the type and location of projects that would be most effective at addressing community needs and concerns. These future projects could result in a wide range of benefits, including risk reduction benefits for residents, employees, and business owners in Red Hook, as well as opportunities for economic and environmental benefits. The study would assess the sustainability of these benefits, the extent to which implementation would result in any negative externalities or opportunity costs, and the likely useful life of targeted drainage improvements. Therefore, the potential far-reaching benefits justify the cost of the proposed study, which is a necessary precursor to any project.

Risk reduction

MEDIUM

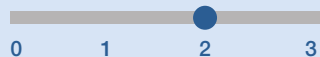
Future improvements identified by the proposed study could create opportunities to reduce the frequency and intensity of flooding from rain events and the resultant damaging effects on property and infrastructure. While not as catastrophic as coastal storm events, stormwater flooding regularly puts community assets at risk to minor flood damage. The proposed study would be a critical step in identifying and prioritizing the location and type of the most needed improvements to Red Hook's stormwater drainage

system. The study would support recommendations to agencies and property owners to improve drainage conditions, paving the way for future projects to reduce stormwater flooding in the neighborhood.

The recommended drainage improvement projects that stem from this study could create opportunities to reduce risk of smaller, more frequent flooding from heavy rain events. While they would not create significant flood reduction in the case of a 100-year coastal storm event, they could enable more efficient and effective drainage following storm events, thus aiding in more rapid recovery and potentially reducing the length of time that floodwaters remain.

This project would also contribute to the goals of Governor Cuomo’s recently unveiled infrastructure strategy, “Reimagining New York for a New Reality,” which calls for protection and improvement to wastewater systems.

Timeframe for implementation



The timeframe for completion of the drainage study would be dependent upon several factors, including the number of sites selected for analysis, the extent of coordination with NYC DEP, and the level of detail in the available existing conditions information. However, it is anticipated

that the study could be completed within one year. Pending the findings of the study, the decision to implement and timeline for implementation of any the identified drainage/ sewer system improvement project(s) would be dependent upon the ability to secure funding, the process of adding the project(s) to New York City’s capital program, and site-specific conditions that would dictate additional factors such as the need for additional inter-agency coordination.

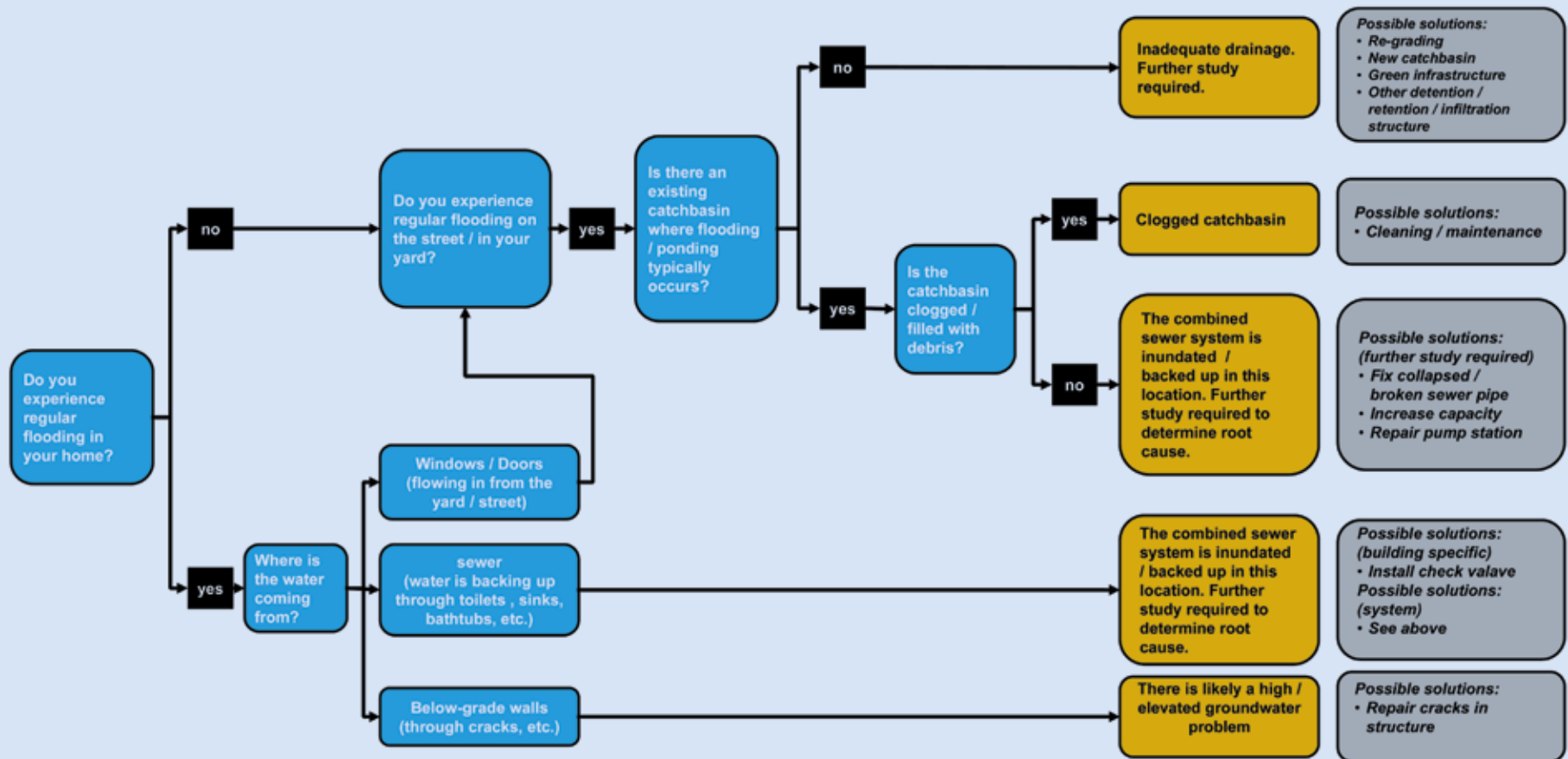
Regulatory requirements

There are no regulatory review requirements for a drainage study, but there would be necessary coordination with NYC DEP throughout the process. The effectiveness of the study would be contingent upon cooperation and provision of information on the existing system being provided by NYC DEP. Implementation of drainage improvement projects would need to be studied and undertaken by NYC DEP and the New York City Department of Design and Construction (DDC) if deemed feasible, implementable, and appropriate. They would also likely require coordination with and review by the New York City Department of Transportation (DOT). It is possible that the study might also require New York State’s Historic Preservation Office (SHPO) review.

Jurisdiction

Red Hook is within the jurisdiction of the City of New York; as such, NYC DEP is responsible for the construction, operations, and maintenance of the sewer and drainage infrastructure in Red Hook.

Drainage issues: diagnostic decision tree



Project Overview

Recovery Support Functions



Infrastructure



Natural & Cultural Resources

Cost

\$200M

Risk Reduction

HIGH

Health & Social Benefits

HIGH

Economic Benefits

HIGH

Timeline (years)



STRATEGY: PROVIDE COASTAL FLOOD PROTECTION

Red Hook integrated flood protection system

Featured Project

The Red Hook NYRCR Planning Committee supports the recently announced State and City partnership to create an integrated flood protection system in Red Hook. The Committee recommends that the development of this project be conducted in accordance with community principles such as economic development, sustainable construction, and local job creation. Through adherence to the principles drafted by the Committee, this project can both protect and enhance Red Hook.

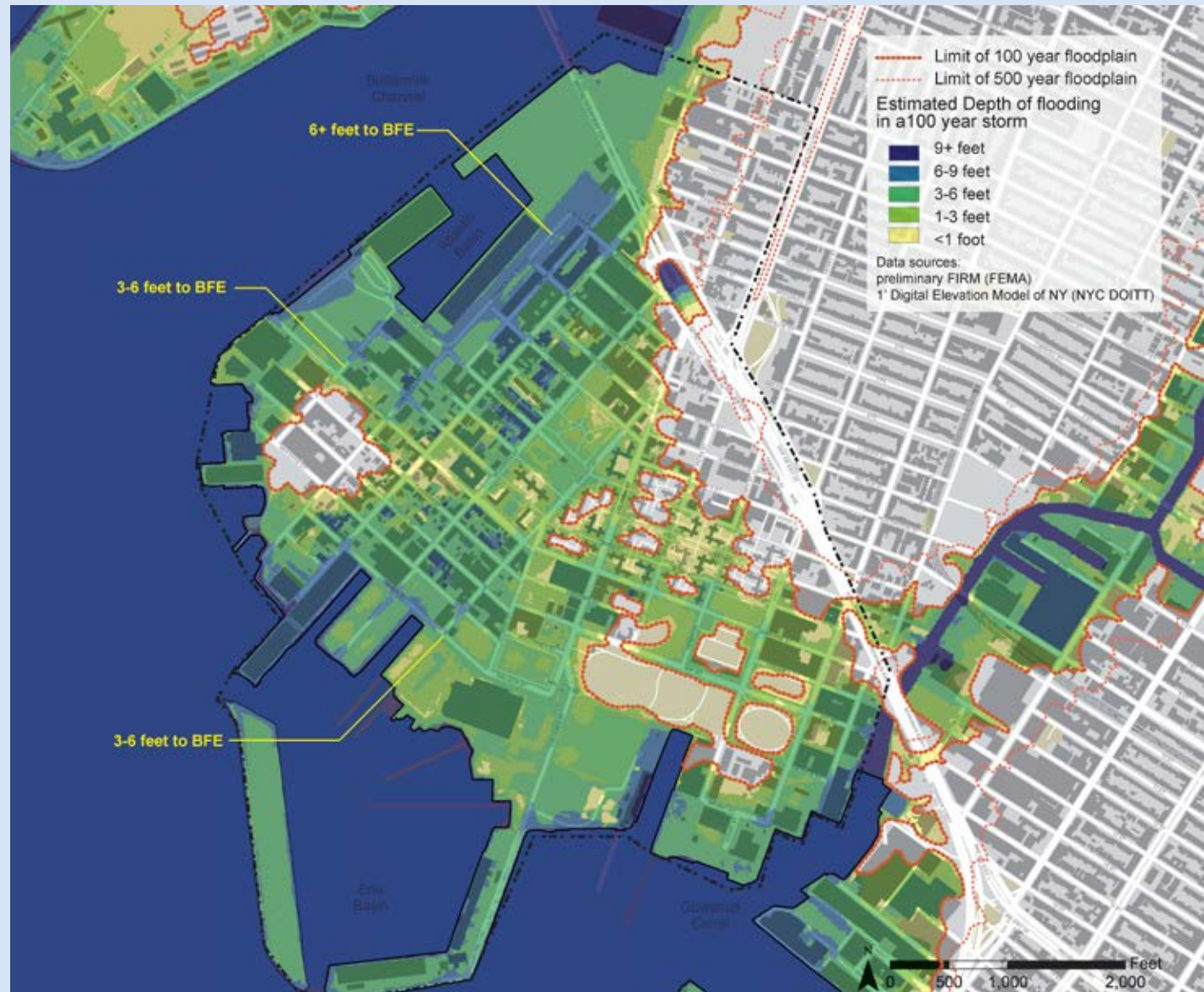
Project description

Red Hook is a low-lying peninsula at high risk from future storm events and sea-level rise—the entire Planning Area lies within the New York State Department of State (NYS DOS) Risk Areas—and thus is at risk of inundation in a 100-year storm event in the future.

On January 7, 2014, Governor Cuomo announced a commitment, in partnership with the City of New York, to develop a comprehensive flood management system for Red Hook—the first of its kind in the nation—to protect the neighborhood from future coastal flooding events.²¹ As described in “A Stronger, More Resilient New York

(2013),” integrated flood protection systems have been demonstrated to be effective at reducing flood risk around the world, including in the Netherlands and the United Kingdom. The integrated flood protection system for Red Hook is intended to protect all assets that are inside the “line of protection” created by the protective features and within the 100-year floodplain. While the details of the project are yet to be determined, the system will likely be composed of a variety of types of protective features, which might include multi-purpose berms, flood walls, elevated sites, deployable flood walls, elevated streets, and drainage pumps.

Figure IV.5: Flood depths in Red Hook



The Committee wants to ensure that this important project is consistent with the Community’s vision statement and strategies to strengthen and protect Red Hook’s unique and diverse residential, retail, and industrial fabric, while utilizing sustainable energy and minimizing impact on the natural environment. To that end, the Committee identified the following principles to guide creation of an integrated flood protection system for Red Hook:

Enhance public waterfront access. Access to existing publicly owned and accessible waterfront (Valentino Pier) as well as privately owned accessible waterfront spaces (such as Erie Basin Park and Atlantic Basin) should be preserved and expanded.

Preserve and respect the character of the neighborhood. Whether building-specific or neighborhood-wide, flood protection measures should protect and preserve the character of the neighborhood, including low-rise blocks, big sky, cobblestone streets, and historic buildings.

Maintain maritime capacity and enhance water-based uses. Flood protection should not interfere with continued active use of Red Hook’s waterfront. While these uses may evolve over time, an active waterfront with economic uses is a critical part of Red Hook’s past and future.

Design protective infrastructure to be multi-functional and to provide community amenities. Other potential uses and co-benefits of flood protection infrastructure should be considered and incorporated into the design of integrated flood protection.

Maximize protection of building stock. While all buildings in Red Hook may not be guarded by a neighborhood-wide strategy, any strategy should seek to maximize the number of buildings and properties protected as is feasible and reasonable.

Address flood protection needs of sites and structures outside, as well as inside, the line of protection, and in the interim while protection is designed and built. Since all buildings in Red Hook may not be able to be protected by a neighborhood-wide strategy, strategies to address the needs of those buildings that may fall outside a “line of protection” should be considered and addressed.

Encourage everyone to build resiliently. Provide incentives for private landowners whose properties are outside or may become part of the integrated flood protection to undertake flood protection measures that contribute to community-wide protection. As a complement to the integrated flood protection system, individual buildings should still be built to meet the provisions of Appendix G of the New York City Building Code, which outlines improved construction techniques in the floodplain.

Address flood insurance premiums. Flood protection, when implemented, should enable reduction in insurance premiums through a Federal Emergency Management Agency (FEMA) map change or other process for protected properties, and should be in accordance with U.S. Army Corps of Engineers (USACE) standards. Land use and building policies should also enable building owners in

Red Hook to make the necessary improvements to their buildings to provide for flood protection, resiliency, and reduced insurance premiums.

Address and improve current and future drainage issues. Flood protection measures should deal with water that falls within the protected area and avoid exacerbating existing drainage problems within the neighborhood.

Employ local residents in the implementation and construction of integrated flood protection. Construction of flood protection would be a large undertaking. Such a project should aim to employ local residents. In anticipation of this, a local job training program to cultivate such a skilled labor force is recommended.

Be carbon neutral. Construction of flood protection should aspire to be carbon neutral so as to not add to the climate change issues which are in part responsible for the increased risk of flooding and sea level rise that the Community expects to experience in the future.

Be flexible to future and changing community needs. Flood protection should be developed in a way that enhances and respects future planning for Red Hook, but can also accommodate the ever-evolving range of waterfront uses.

Be informed by ongoing input from the Red Hook community. The development of the integrated flood protection strategy for Red Hook should involve ongoing input from residents, business owners and other stakeholders in the Community.

Cost

\$200 MILLION

A preliminary estimate of approximately \$200 million has been provided for the cost of the entire integrated system, independent of the NYRCR process. These costs and the phasing of a protection system are subject to further planning and engineering. The Planning Committee is not recommending that any of its allocation of Community Development Block Grant – Disaster Recovery (CDBG-DR) funds be spent on this project, however it recommends that the principles discussed above inform the project.

Benefits

Economic benefits

HIGH

Although the details of the project are not yet defined, the integrated flood protection system would protect the majority of the commercial floor area in Red Hook, including key commercial locations on Van Brunt Street and other mixed-use corridors (i.e., Clinton Street, Lorraine Street) that are currently at risk from coastal flooding. Additionally, implementation and construction of integrated flood protection would result in opportunities for job creation and training for local residents. The Committee has emphasized that it is a priority that the jobs directly emerging for the construction and maintenance of this project benefit Red Hook residents. The integrated flood protection would also create opportunities to attract more visitors to the neighborhood and therefore can result in economic spin-off benefits.

Though this project would likely require coordination and certain expenditures by local agencies, it may also result in reduced cost to local government in other areas. For example, an integrated flood protection system may reduce stormwater runoff into the existing system, thereby reducing or delaying the need for other sewer system capacity improvements and thus having a positive net effect on local government expenditures.

Health and social benefits

HIGH

This project would result in health and social benefits by protecting many buildings, and in particular would protect the socially vulnerable populations of Red Hook Houses and other supportive services and subsidized housing in Red Hook. The project would reduce the exposure of key health and social service providers in Red Hook, potentially reducing service interruptions to these critical networks. Additionally the Committee hopes the integrated flood protection project would create valuable open space and recreational amenities that would provide health and social benefits to the Community.

Environmental benefits

HIGH

An integrated flood protection system would provide opportunities for a number of environmental benefits to Red Hook including protecting natural and environmental assets from flood damage, and potentially reducing pollution release on land. By reducing flood and salt water exposure, many parks and vegetation could be protected

by this project. Since areas of Red Hook are industrial and home to a number of open industrial uses, the potential for floods to disperse environmental hazards is a concern in the area. Comprehensive flood protection would help contain these hazards on site. The Planning Committee has also emphasized a strong preference that construction of the project be conducted in an environmentally conscious manner resulting in a “zero carbon footprint.” With low impact construction and utilizing green design features such as environmentally sensitive materials, green infrastructure to manage stormwater, low-maintenance plantings, or solar-powered lighting the integrated flood protection system’s carbon footprint can be reduced.

Cost-benefit analysis

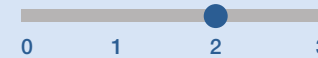
This project is an investment with high potential to prevent and minimize damage from coastal flooding. The project would result in a wide range of benefits, including risk reduction benefits for all buildings and sites within the 100-year floodplain—and for the people who live, work, and/or visit these buildings and sites. The project also has the potential to provide a multitude of health and social, economic and environmental benefits. As the details of the project are determined, there would be additional insight into the sustainability of these benefits, the extent to which integrated flood protection would result in any negative externalities or opportunity costs, and the likely useful life of an integrated flood protection system. With phased implementation both the level of protection (i.e. severity of storm event) and the area protected would be scaled up over time as necessary, providing beneficial flexibility. The potential far-reaching benefits justify the cost of the project.

Risk reduction

HIGH

An integrated flood protection system would reduce risk to many community assets and a significant portion of the population living and working in Red Hook. While the actual alignment of the protection is still to be determined, implementation of this project would reduce risk to most of the 1,560 properties (14 million square feet of floor area) currently in the NYS Department of State's (DOS) moderate, high, and extreme risk areas, by effectively eliminating their exposure to the hazard of future coastal storm events for those areas falling inside the line of protection. When complete, this project would reduce exposure and thus risk to almost every asset in Red Hook—across the spectrum of economic assets, housing assets, health and social services assets, natural and cultural resources and infrastructure systems. Analysis using the NYS DOS Risk Assessment tool suggests that assets protected by such a system would see a 40% to 60% reduction in their risk score in a 100-year storm event. The degree to which risk is reduced in lower frequency, higher intensity events such as a 500-year storm would depend on the design of the flood protection system. In addition to reducing the risk to the buildings and sites that comprise the assets, the project would also reduce risk to the people who live, work, and/or visit these assets, including the 12,000 residents of Red Hook, almost half of whom are residents of Red Hook Houses, one of New York City's largest Public Housing projects.

Timeframe for implementation



The timeframe for implementation is to be determined. An important first step in the process is ongoing coordination between New York State and New York City regarding the partnership to fund implementation, as well as stakeholder involvement to guide the design of the system.

Regulatory requirements

Depending on the location and specifications of the integrated flood protection system, the project would be subject to regulatory review from a number of city agencies, including the New York City Department of Environmental Protection (NYC DEP), the New York City Department of Transportation (NYC DOT), the New York City Department of Buildings (NYC DOB), and the New York City Department of City Planning (NYC DCP). Due to the scale of the project, the receipt of federal funding, and the project's likely location on the waterfront, State and Federal agencies would also likely be involved in the review and permitting of the project; such agencies are likely to include (at least) the New York State Department of Environmental Conservation (NYS DEC), the Port Authority of New York and New Jersey (PANYNJ), the U.S. Coast Guard, and the USACE and NYS DOS.

Jurisdiction

The details of the project are to be determined, and thus the jurisdiction is not yet known, although it is possible that the integrated flood protection system would be located both on public property—under the jurisdiction of New York City—and private property.



V. Additional materials

A. Additional resiliency recommendations

The Proposed and Featured Projects discussed in previous sections address some of the most critical needs in Red Hook but are most effective if supplemented with the Additional Resiliency Recommendations detailed below. These Recommendations, if implemented, would advance the resiliency strategies and community goals outlined earlier including increasing community capacity, enhancing the local economy, promoting economic opportunities, addressing housing resiliency challenges, creating transportation connections, and more.

Table V-1– Additional Resiliency Recommendations

Strategy	Project name	Short project description	Regional project (Y/N)	Estimated cost
Strengthen community capacity to prepare for, respond to, and recover from emergencies	Red Hook local emergency preparedness plan	A local disaster preparedness plan is needed and should be developed in coordination with the proposed relief center network. Funding for development of local disaster preparedness plan has been allocated to the Red Hook Coalition by the Brooklyn Community Foundation and development of the project is beginning to be implemented. It is recommended that this plan be developed with consideration to the following elements: Planning for seasonal community-wide preparedness drills; Development of trained citizen teams on every block; Establishment of central communication hub used year-round; Involvement of youth/schools in development and enactment of the plan; Provision of information on what to do/where to go for information after the event; Guidance on how to develop a family preparedness plan. Within the local preparedness plan, locations for emergency response pre-staging and response logistics should be identified	N	<\$500,000
Strengthen community capacity to prepare for, respond to, and recover from emergencies	Citywide information clearinghouse, with tabs for individual neighborhoods	Red Hook residents emphasized the need for more and better organized resources on all aspects of resiliency and recovery for homeowners, tenants, and business owners. A resiliency information clearinghouse would operate at a citywide level and provide tabs with information for specific neighborhoods. Information would be shared through a website, manual, and/or webinars/lectures. General information on resiliency improvements, insurance issues, etc. would be provided. Specific information provided through the site would include: permitting process, FEMA claims, insurance claims, consumer rights, building regulations, grant sources, counseling services, legal aid, and other resources. Small business and industrial resiliency check-lists could also be available and distributed to all relevant businesses.	Y	<\$500,000

Strategy	Project name	Short project description	Regional project (Y/N)	Estimated cost
Strengthen community capacity to prepare for, respond to, and recover from emergencies	Resilient health-care resource program, including mobile health clinic	As a “medically underserved area”, Red Hook needs better access to physical healthcare facilities and trained medical personnel on a regular basis in the wake of emergency events. A mobile health clinic route through Red Hook provides a short-term solution to this issue. The project would provide year-round increased services to the neighborhood with increased service in the wake of emergency events. A mobile health clinic would operate in partnership with an area health provider—ideally one that is locally based and would not compete with existing Red Hook health clinics. There are precedents for such arrangements working effectively—North Shore LIJ Hospital for example provided mobile vans to Long Island, Staten Island, and Broad Channel one or two days per week for a period of time after Superstorm Sandy. This recommendation complements the Proposed Project to fund an emergency generator at a local health-care provider, which would prevent service disruption.	N	\$1- \$10 million
Strengthen community capacity to prepare for, respond to, and recover from emergencies; Strengthen individual economic resiliency & financial stability	Emergency services/ nurse training and Community Emergency Response Team (CERT) training partnership	Red Hook Coalition received funding for development of a teen CERT program and it would be beneficial to connect graduates of this program or youth participating in other emergency preparedness planning efforts to nurse and emergency services training programs in the region. Limited free certified nurse aide (CNA) training and home health aide (HHA) training is provided by New York State Department of Labor and New York State Department of Health and local technical and community colleges provide moderate cost certification courses in these professions as well. A program that recruits participants provides basic education to meet training pre-requisites, and places participants in appropriate training program would increase the capacity of the community and provide youth with valuable economic opportunities.	Y	\$500,000 - \$1 million
Increase the resiliency of existing businesses and promote opportunities for economic development	Long-term resiliency economics study for industrial uses	Implementing resiliency upgrades is uniquely challenging for industrial businesses in Red Hook due to the concentration of industrial businesses in the extreme and high risk zones and the type of buildings, equipment, and operations that need to be protected. A study of the economics of retrofits needed to make industrial business resilient, in the context of industrial business operations, would help determine the challenges these businesses face in becoming resilient. Where economics are challenged the study would explore potential incentives associated with mixed-use development, or, for vacant land, rezoning to economically viable uses.	Y	<\$500,000

Strategy	Project name	Short project description	Regional project (Y/N)	Estimated cost
Increase the resiliency of existing businesses and promote opportunities for economic development	Land and facilities activation study of Atlantic Basin region	Activating the waterfront in and around Atlantic Basin would provide economic and public benefits. A study to identify projects that would increase activity at the land and facilities surrounding Atlantic Basin – including the Cruise Terminal and associated parking facilities -- and identify next steps and an implementation strategy could help catalyze revitalization. Consideration should be given to plans for expanded programming on Governors Island and associated service needs that, if provided through Red Hook, could increase activity and employment near the Red Hook waterfront. Consideration of connections to Van Brunt Street – including coordination with proposed development on Imlay Street as well as uses along connector streets – could strengthen the link between the Van Brunt retail corridor and the waterfront. In conjunction with the proposed project to fund a ferry landing at or near Atlantic Basin, the outcome of this study could establish a new waterfront destination within Red Hook and drive economic development within the community.	N	<\$500,000
Increase the resiliency of existing businesses and promote opportunities for economic development	Community / cultural / food space in Red Hook Houses	In order to increase interaction between Red Hook Houses residents and residents from throughout the neighborhood, a cultural center should be established in Red Hook Houses which provides food, music, and cultural events, and would also serve as a central communication/meeting location in the wake of emergency events. Increasing communication across Red Hook neighborhoods is critical to the short and long-term welfare and resiliency of Red Hook	N	\$1 - \$10 million
Increase the resiliency of existing businesses and promote opportunities for economic development & Increase the physical and economic resiliency of private and public housing	Port Authority of New York and New Jersey (PANYNJ) and New York City Housing Authority (NYCHA) collaboration	PANYNJ and NYCHA are major landholders in Red Hook and play a critical role in the lives of many Red Hook residents and business owners. The Planning Committee and public have identified a range of needs at the Cruise Terminal, Atlantic Basin and Red Hook Houses that can be addressed through open conversation with PANYNJ and NYCHA. Through coordination, Red Hook residents can coordinate with PANYNJ and NYCHA to make their facilities more resilient.	N	N/A

Strategy	Project name	Short project description	Regional project (Y/N)	Estimated cost
Increase the physical and economic resiliency of private and public housing	Red Hook Houses resiliency improvements	In addition to the proposed installation of solar-powered back-up lighting in Red Hook Houses, it is recommended that NYCHA undertake a number of critical resiliency improvements that will address the most urgent hazards that emerged in the wake of Superstorm Sandy. Critical needs include: mold remediation, elevating mechanicals, and flood-proofing of basement and ground floor spaces. NYCHA is already planning on repairing mechanical systems in Red Hook Houses but it is recommended that repairs go beyond basic flood mitigation and include effective and permanent elevation of these systems above the 100-year floodplain base flood elevation. Additionally NYCHA is considering establishing a resiliency coordinator at Red Hook Houses and other sites, this coordinator could increase social capacity and would supplement the proposed and recommended projects in the NYRCR Plan.	N	\$10+ million
Increase the physical and economic resiliency of private and public housing	National Flood Insurance Program (NFIP) policy reform	The Homeowner Flood Insurance Affordability Act of 2014 took measures to curb premium increases and make the program more responsive to resiliency upgrades that are most feasible in urban environments (e.g., alternatives to elevating attached housing). Successful implementation of insurance relief under the Act, including the law's provisions for educating homeowners about mitigation measures that can help reduce flood insurance rates, is of critical concern to Red Hook.	Y	N/A
Increase transit connectivity and ensure redundant transportation/transit options to facilitate evacuation and rebuilding	Direct bus from Red Hook to Lower Manhattan	In addition to the proposed ferry enhancements, it is recommended that the Metropolitan Transit Authority (MTA) establish a direct bus route from Red Hook to Lower Manhattan. One option is to restore service on either the B77 or B71—both cut in 2010—and extend the route to Lower Manhattan via the Brooklyn Battery (Hugh Carey) Tunnel. Another option is to extend the existing M22 route from Lower Manhattan to Red Hook.	Y	\$1 - \$10 million
Improve drainage and reduce flooding from sewer back-up	Van Brunt Street Pumping Station repairs	As noted in the NYC Wastewater Resiliency Plan, the Van Brunt Street Pumping Station was completely inundated during Superstorm Sandy, and there is a history of flooding at the location due to smaller storms. Due to the extreme depth of the critical flood and the lack of an existing structure (i.e., the pumping station is below grade with hatch entryways in the sidewalk), the electrical controls need to be elevated and a new building constructed.	N	\$2.75 million

B. Master table of projects

Master table of projects included in the Red Hook NYRCR Plan

The Master table of projects below includes all Proposed Projects, Featured Projects, and Additional Resiliency Recommendations identified by the NYRCR Red Hook Planning Committee and larger Community.

Table V-2 – Master table of projects described in the plan

Strategy	Project name	Short project description	Project category	Estimated cost	Regional project (Y/N)
Strengthen community capacity to prepare for, respond, and recover from emergencies	Relief center network	This project will fund the creation of a network of relief centers to house the coordination of post disaster, such as provision of food, water, power, health, medical services, and information. The project will provide funding to existing community facilities and organizations for building hardening, on-site capital improvements, and initial staffing costs. The network will provide both physical and informational resources in the wake of a disaster, and facilitate disaster-preparedness coordination across community-based organizations (CBOs) in advance of an event.	Proposed project	\$1.5 million	N
	Emergency backup generator for health and social services provider	This project consists of the purchase and installation of one fixed generator for a selected health and social service provider in Red Hook to ensure continuity of critical services to the Community during and after an emergency.	Proposed project	\$350,000	N
	Red Hook local emergency preparedness plan	A local disaster preparedness plan is needed and should be developed in coordination with the proposed relief center network. Funding for a local disaster preparedness plan has been allocated to the Red Hook Coalition by the Brooklyn Community Foundation. Elements of the plan should include/ consider: Planning for seasonal community-wide preparedness drills; Development of trained citizen teams on every block; Establishment of central communication hub used year-round; Involvement of youth/schools in development and enactment of the plan; Provision of information on what to do/where to go for information after the event; Guidance on how to develop a family preparedness plan. Within the local preparedness plan, locations for emergency response pre-staging and response logistics should be identified	Additional resiliency recommendation	<\$500,000	N

Strategy	Project name	Short project description	Project category	Estimated cost	Regional project (Y/N)
Strengthen community capacity to prepare for, respond, and recover from emergencies (cont'd)	Citywide information clearinghouse, with tabs for individual neighborhoods	Red Hook residents emphasized the need for more and better organized resources on all aspects of resiliency and recovery for homeowners, tenants, and business owners. A resiliency information clearinghouse would operate at a citywide level and provide tabs with information for specific neighborhoods. Information would be shared through a website, manual, and/or webinars/lectures. General information on resiliency improvements, insurance issues, etc. would be provided. Specific information provided through the site would include: permitting process, FEMA claims, insurance claims, consumer rights, building regulations, grant sources, counseling services, legal aid, and other resources. Small business and industrial resiliency check-lists could also be available and distributed to all relevant businesses.	Additional resiliency recommendation	<\$500,000	Y
	Resilient health-care resource program, including mobile health clinic	Red Hook's health-care network is vulnerable to disruptive events due to a lack of local medical facilities and local, trained medical personnel. A mobile health clinic route through Red Hook could provide year-round increased services to the neighborhood in the wake of emergency events. A mobile health clinic would operate in partnership with an area health provider—ideally one that is locally based and would not compete with existing Red Hook health clinics. The mobile health clinic would help meet Red Hook's health-care needs by providing both resources and trained personnel.	Additional resiliency recommendation	\$500,000 - \$1 million	N
	Emergency services/nurse training and Community Emergency Response Team (CERT) training partnership	Existing CERT programs are already funded in Red Hook. It would be beneficial to connect CERT program graduates to nurse and emergency services training programs in the area. Such a project would recruit participants, identify gaps in pre-requisite, provide or partner to provide basic education as needed, and help place participants in appropriate training program.	Additional resiliency recommendation	\$500,000 - \$1 million	Y
Strengthen individual economic resiliency & financial stability	Resiliency construction workforce training	This project will fund training of Red Hook youth and adults—particularly low-income individuals with limited employment experience and/or education—and connect them to employment opportunities related to the construction of resilient infrastructure or building improvements. The program will provide a multi-week training program, outreach, and job readiness preparation and post-training job placement services.	Proposed project	\$750,000	N

Strategy	Project name	Short project description	Project category	Estimated cost	Regional project (Y/N)
Increase the resiliency of existing businesses and promote opportunities for economic development	Local financial assistance program for housing and business retrofits	This project will provide financial support to Red Hook small businesses and homeowners/tenants seeking to implement resiliency upgrades, as well as to entrepreneurs seeking to start micro-businesses. The program will be administered by a locally based organization, including through the services of a Brooklyn-based Community Development Financial Institution (CDFI).	Proposed project	\$1 million	N
	Long-term resiliency economics for industrial uses	Implementing resiliency upgrades is uniquely challenging for industrial businesses in Red Hook due to the concentration of industrial businesses in the extreme and high risk zones and the type of buildings, equipment, and operations that need to be protected. A study of the economics of retrofits needed to make industrial business resilient would help determine the challenges these businesses face in becoming resilient. Where economics are challenged the study would explore potential incentives associated with mixed-use development, or, for vacant land, rezoning to economically viable uses.	Additional resiliency recommendation	<\$500,000	Y
	Land and facilities activation study of Atlantic Basin region	Activating the waterfront in and around Atlantic Basin would provide economic and public benefits. A study to identify projects that would activate the land and facilities surrounding Atlantic Basin and identify next steps and implementation strategy could help catalyze revitalization.	Additional resiliency recommendation	<\$500,000	N
	Community / cultural / food space in Red Hook Houses	In order to increase interaction between Red Hook Houses residents and residents from throughout the neighborhood, a cultural center should be established in Red Hook Houses which provides food, music, cultural events, and would also serve as a central communication/meeting location in the wake of emergency events. Increasing communication across Red Hook neighborhoods is critical to the short and long-term welfare and resiliency of Red Hook	Additional resiliency recommendation	\$1 - \$10 million	N

Strategy	Project name	Short project description	Project category	Estimated cost	Regional project (Y/N)
Strengthen community capacity to prepare for, respond, and recover from emergencies; Increase the resiliency of existing businesses and promote opportunities for economic development	Port Authority of New York and New Jersey (PANYNJ) and New York City Housing Authority (NYCHA) collaboration	PANYNJ and NYCHA are major landholders in Red Hook and play a critical role in the lives of many Red Hook residents and business owners. The Planning Committee and public have identified a range of needs at the Cruise Terminal, Atlantic Basin and Red Hook Houses that can be addressed through open conversation with PANYNJ and NYCHA. Through coordination, Red Hook residents can coordinate with PANYNJ and NYCHA to make their facilities more resilient.	Additional resiliency recommendation	N/A	N
Increase the physical and economic resiliency of private and public housing	Solar-powered emergency lights for Red Hook Houses stairwells (Phase I)	This project will fund the implementation of a solar-powered emergency lighting pilot project in two or three buildings in Red Hook Houses. This will provide backup lighting when the main grid fails, ensuring the safety and mobility of residents.	Proposed project	\$100,000	N
	Solar-powered emergency lights for Red Hook Houses stairwells (Phase II)	This project will expand the pilot to installation of solar-powered emergency lighting in all residential buildings in Red Hook Houses. This will provide backup lighting when the main grid fails, ensuring the safety and mobility of residents.	Featured project	\$1 million	N
	Red Hook Houses resiliency improvements	In addition to the proposed installation of solar-powered back-up lighting in Red Hook Houses, it is recommended that NYCHA undertake a number of critical resiliency improvements. Critical needs include: mold remediation, elevating mechanicals, and flood-proofing of basement and ground floor spaces.	Additional resiliency recommendation	\$1 - \$10 million	N
	National Flood Insurance Program (NFIP) policy reform	The Homeowner Flood Insurance Affordability Act of 2014 took measures to curb premium increases and make the program more responsive to resiliency upgrades that are most feasible in urban environments (e.g., alternatives to elevating attached housing). Successful implementation of insurance relief under the Act, including the law's provisions for educating homeowners about mitigation measures that can help reduce flood insurance rates, is of critical concern to Red Hook.	Additional resiliency recommendation	N/A	Y

Strategy	Project name	Short project description	Project category	Estimated cost	Regional project (Y/N)
Create opportunities for alternative and/or redundant power generation and distribution	Red Hook Houses microgrid feasibility study (Phase I)	This project will be a feasibility study for a microgrid that can provide backup power for Red Hook Houses—home to 50% of the Red Hook Community— during an emergency.	Proposed project	\$300,000	N
	Red Hook Houses microgrid implementation (Phase II)	This project install a cogeneration facility or other alternative power source with a microgrid tie-in to provide backup power for Red Hook Houses—home to 50% of the Red Hook Community— during an emergency.	Featured project	\$50 - \$500 million	N
Increase transit connectivity and redundancy to facilitate evacuation and rebuilding	New ferry landing at or near Atlantic Basin (Phase I)	This project will provide partial funding for the construction of a new ferry landing, at or near Atlantic Basin, contingent on a commitment of matching funds by a private/public entity to ensure completion of the ferry landing.	Proposed project	\$500,000	Y
	Subsidize operation of a new or existing ferry route to Red Hook (Phase II)	This project will entail the ongoing operation of a regular commuter Ferry Service connecting Red Hook to Manhattan, and potentially Governor's Island and other destinations.	Featured project	\$3 - \$5 million	Y
	Direct bus from Red Hook to Lower Manhattan	In addition to the proposed ferry enhancements, it is recommended that the Metropolitan Transit Authority (MTA) establish a direct bus route from Red Hook to Lower Manhattan. One option is to restore service on either the B77 or B71—both cut in 2010—and extend the route to Lower Manhattan via the Brooklyn Battery (Hugh Carey) Tunnel. Another option is to extend the existing M22 route from Lower Manhattan to Red Hook.	Additional resiliency recommendation	\$1 - \$10 million	Y
Improve drainage and reduce flooding from sewer back-up	Red Hook drainage study	This project would fund a study to analyze the existing conditions that contribute to frequent flooding in Red Hook. By uncovering unknown details of existing conditions, the study would identify specific measures to improve drainage in the neighborhood.	Proposed project	\$500,000	N
	Van Brunt Street Pumping Station repairs	As noted in the NYC Wastewater Resiliency Plan, the Van Brunt Street Pumping Station was completely inundated during Superstorm Sandy, and there is a history of flooding at the location due to smaller storms. Due to the extreme depth of the critical flood and the lack of an existing structure (i.e., the pumping station is below grade with hatch entryways in the sidewalk), the electrical controls need to be elevated and a new building constructed.	Additional resiliency recommendation	\$1 - \$10 million	N
Provide coastal flood protection	Red Hook integrated flood protection system	The Red Hook NYRCR Planning Committee applauds the recently announced State and City partnership to create an integrated flood protection system in Red Hook. The Committee recommends that the development of this project be conducted in accordance with community principles such as economic development, sustainable construction and local job creation. Through adherence to the principles drafted by the Committee, this project can both protect and enhance Red Hook.	Featured project	\$200 million	Y

Extended table of resiliency recommendations

In addition to the projects already presented in the NYRCR Plan, the below table includes additional project proposals and recommendations that were brainstormed by the Red Hook community. These initiatives, –in combination with the aforementioned proposed projects, featured projects, and additional resiliency recommendations—total 82 projects and present a fuller picture of the key ideas and proposals that the Committee discussed over the course of the NYRCR process. Together these many initiatives meet the Red Hook Planning Committee’s vision and long term goals for creating a more resilient, sustainable, and equitable community.

Table V-3 – Extended table of resiliency recommendations

Strategy	Project/recommendation name	Regional project (Y/N)
Strengthen community capacity to prepare for, respond to and recover from emergencies	Red Hook Houses emergency preparedness and response plan and communication network	N
	Local communications network	N
	Emergency healthcare resources inventory and response plan	N
	Resilient food supply assessment	N
	Increased inter-agency coordination and response in emergencies	Y
	“Universal application” for residential, business, and individual recovery grants and assistance applications	Y
	Local maritime recreation center and emergency response team	Y
Increase the resiliency of existing businesses and promote opportunities for economic development	Commercial corridor flood protection	N
	Merchants Association or Business Improvement District (BID) development (to organize resiliency improvements amongst businesses)	N
	Technical assistance/audit program for small businesses and industrial businesses	N
	Way-finding sign program (to support economic development and share information about emergency routes and relief centers)	N
	Financial assistance to offset commercial insurance costs	N
	Grant to restore historic commercial buildings damaged by Sandy	N
	Study of need and incentives for new, resilient affordable market rate housing on vacant/under-utilized sites	N
	Program to incentivize development of underutilized lots	N
	Policy reform to enable rapid pier repair, development of resiliency enhancements at the water’s edge, and facilitation of boat access	Y
	Resilient design guidelines for urban buildings and neighborhoods	Y
	Resiliency/green design incentive program	N

Strategy	Project/recommendation name	Regional project (Y/N)
Strengthen individual economic resiliency and financial stability	Community Based Agreements (CBA) toolkit	N
	Workforce training gap analysis	N
Increase physical and economic resiliency of private and public housing	Technical assistance program for homeowners	N
	Financial or technical support for Red Hook Houses tenants to undertake resiliency improvements	N
	Red Hook Houses blue/green roof	N
	Housing support for dislocated households	N
	Incentive/zoning program for new, resilient affordable or market rate housing on vacant/under-utilized sites	N
	Study of rezoning to allow alternate ground floor uses in residential zone	N
	Expedited permitting and review for residential or commercial resiliency retrofits	Y
	Financial assistance to offset residential insurance costs	N
Create opportunities for alternative and/or redundant power generation and distribution	Pilot alternative energy generation project that would possibly include: geothermal power, wind power, solar power, or Buttermilk Channel tidal power	N
	Cold-ironing power generation feasibility study	N
	Two-way power connection (cold ironing) pilot project (capturing waste power from working boat systems for on land use)	N
	Back-up power for cell phone tower	N
	Local solar power incentive program	N
	Targeted energy efficiency improvements throughout Red Hook	N
	Electrical grid resiliency improvements	Y
	Portable emergency back-up solar power system	N
Increase transit connectivity and redundancy to facilitate evacuation and rebuilding	Direct bus from Red Hook to Downtown Brooklyn	Y
	Red Hook streetcar system	N
	Pedestrian improvements at Beard Street, the BQE underpass, or other locations	N
	Red Hook bikeshare program	N
	Expanded bike routes running through center of Red Hook and Red Hook Houses	N

Strategy	Project/recommendation name	Regional project (Y/N)
Improve drainage and reduce flooding from sewer back-up	Pilot green stormwater garden at one or more sites in Red Hook	N
	NYC Department of Environmental Protection (DEP) Green Infrastructure Program expansion and continuation of green infrastructure incentive program	Y
	NYC DEP Red Hook sewer system maintenance	N
	Study impact of IKEA development on the underground stream at Richards Street	N
Provide coastal flood protection	Shoreline and bulkhead raising in lowest lying areas	N
	Program to incentivize or require coastal protection measures for private waterfront development	N
	Citywide flood barrier project	Y
	Floodproof / make resilient buildings and properties outside the proposed integrated flood protection corridor	N
	Wave attenuation project	Y
	Atlantic Basic water detention pond	N
	Preliminary feasibility study for a new (sub) Wastewater Treatment plant with anaerobic digester to biogas conversion (to generate biogas for use in neighborhood)	N
Assorted public realm improvements	Traffic nuisance mitigation project	N
	Open storage regulation and pollution/spill mitigation	N
	Program to enhance public spaces in Red Hook	N
	Citywide salt-resistant tree planting program in flood prone neighborhoods	Y
	Retrofit Valentino pier to be multi-purpose	N
	Program to repair and activate severed piers	N

C. Public engagement

As a community-driven planning process, public engagement has been central to all phases of development of the Red Hook NY Rising Community Reconstruction (NYRCR) Plan. Over the course of 7 months, more than 300 residents, elected officials, and professionals participated in Red Hook NYRCR events including 3 large public engagement events and over 16 Committee Meetings and additional educational events. Public input guided identification of assets, risks, needs, strategies and ultimately the projects that are proposed for funding in the NYRCR Plan. Extensive public engagement has ensured that the NYRCR Plan reflects the Community's priorities for rebuilding and resiliency.

Planning Committee

The Red Hook Planning Committee is comprised of nine volunteer Committee Members and two volunteer Co-Chairs who represent various constituencies within the Planning Area including but not limited to, homeowners, civic leaders, and business owners. Committee Members serve as ambassadors of the NYRCR process and are responsible for ensuring Community voices are heard throughout the process. The Committee spearheads



Residents and the Consultant Team review key community assets

community outreach, identifying avenues for outreach and developing a strategy for most effectively soliciting public feedback.

Planning Committee Meetings were the central venue for Committee discussion and decision-making. Specific tasks and discussions held at the meetings included: identification of community assets, assessment of needs and opportunities, formalization of reconstruction and resiliency strategies, refinement of projects, and finalization

of Proposed and Featured Projects. Planning Committee Meetings were held in community facilities and were open to the public with regular attendance by members of the public and elected representatives who contributed to the discussions and information sharing. The NYRCR website <http://stormrecovery.ny.gov/nycrcr/community/red-hook> and the self-run Committee blog <http://redhookcrp.wordpress.com/> were key avenues for information sharing before and after Committee

Meetings. The blog was used to provide a detailed catalogue of information from events and input from Committee Members and the public.

Public engagement process

In addition to formal Planning Committee Meetings, the Committee arranged a series of informational presentations and engagements with targeted stakeholders in the Community. These included a community “Innovations Session” that brought designers and practitioners from across the city to speak about resiliency design innovations, a youth engagement through Good Shepherd Services, and a presentation by the Brooklyn Greenway Initiative to describe green infrastructure and possible resiliency improvements for the Brooklyn Waterfront Greenway route. Short presentations were also given at Red Hook Houses West and East tenant associations meetings, a Red Hook Civic Association meeting, and a Community Board 6 meeting to introduce the Community to the NYRCR Program and future engagement opportunities.

Public Engagement Events were the key venues for Committee Members and the Consultant Team to directly engage with the public and solicit input. These events were designed to be highly interactive and maximize community feedback and were held at community-based venues with accessibility and proximity

to targeted stakeholders. At the three Public Engagement Events, the Committee offered general information about the NYRCR process, presented outcomes and information gathered to date and solicited feedback through dynamic discussions and interactive displays. Translators were on hand at all events to accommodate Spanish and Cantonese speakers. Following each Public Engagement Event, community feedback was aggregated and analyzed in order to guide discussion during Planning Committee meetings.

Public engagement event outreach

Extensive outreach was undertaken in advance of the three Public Engagement Events. Planning Committee members leveraged community distribution channels and relationships with local CBOs to distribute approximately 4,500 English and bilingual printed meeting advertisements in the form of palm cards, flyers, and storefront posters. The Committee also designed, produced and distributed approximately 300 business cards with NYRCR Program information. Printed material and email blasts went out to local businesses, community centers and organizations, local schools and religious institutions, local elected officials, and word-of-mouth. Online and print advertisement campaigns were launched through a number of area media outlets.



Youth engagement event with Good Shepherd Services, December 2013.

Online engagement and social media outreach

Announcements, meeting material, and other information were shared through the aforementioned NYRCR website and the Planning Committee blog. The public was also engaged through a customized, interactive map of Red Hook. The interactive map (see image below) <http://nyrisingmap.org/> allowed users to confirm specific physical and cultural assets significant to Red Hook to identify recovery and resiliency needs, and to suggest rebuilding and resiliency initiatives. Residents were able to utilize the map at the first and second Public Engagement Events and flyers were distributed to promote the use of the map. Public comments on the map were summarized and presented to the Planning Committee and utilized as an additional feedback metric.

Public Engagement Event #1 (October 2013)

Program scope; goals, and timeline; Feedback on vision; community assets; and needs and opportunities

The first Public Engagement Event at P.S. 15, the local public school located near Van Brunt Street, showcased the NYRCR program scope and presented the Planning Committee's assessment of community assets and needs and opportunities. The Public Engagement Event began with a formal presentation that introduced NYRCR and the program's objectives to the Community. Following the presentation, an open



Public Engagement #1, October 2013 .

house-style event was held with Committee Members facilitating group discussion and inviting community input on a number of topics including identification of assets, needs, opportunities, and goals as featured on the display boards. While the public engaged in conversation around the display boards, they were invited to take part in interactive exercises by placing stickers and notes on feedback boards. This feedback mechanism created a documented record of community feedback which guided subsequent discussions. The event was also documented on video and can be viewed at the following link: http://www.youtube.com/watch?v=ag_T266C87c



Red Hook residents brainstorm needs and opportunities, October 2013.

Public Engagement Event #2 (November 2013)

Contents of draft conceptual plan; Gathering feedback on strategies and projects

The second Public Engagement solicited public responses to priority resiliency strategies determined by the Planning Committee and public. The event was held at the Miccio Center on the northeast border of the Community which is linked to Red Hook Houses. The focus of the meeting was small group discussions facilitated by Consultant Team topic experts and Planning Committee Members. The meeting culminated with community members reporting back to the

larger group on the key takeaways that emerged through the small group discussions. All attendees were invited to participate in a resiliency strategies prioritization poll the results of which provided powerful guidance to the Planning Committee and directly shaped the project development going forward. Additionally, youth from the Red Hook Initiative Digital Stewards program filmed a documentary video of the event which effectively captured participants' feedback and sentiments. The video can be viewed at the following link: <http://vimeo.com/79390900>



Public Engagement #2, November 2013.



Public Engagement Event #3 (February 2014)

Presentation of proposed and featured projects, and additional resiliency recommendations; Gathering feedback on strategies and projects

The third Public Engagement provided a critical opportunity to share the proposed and featured projects with the Community and obtain feedback on these projects. The Red Hook Planning Committee organized the weekend-long open house to maximize the opportunity for the public to provide comment. The Public Engagement Event took place at Realty Collective gallery space—a space that served as an aid station immediately after the storm and hosted Sandy Survivor meetings many months after. To encourage public engagement with community members who might not otherwise have engaged in the process, the Planning Committee selected an open space located on Van Brunt Street, a local retail corridor with high foot traffic, across from a bus stop and around the corner from PS 15.

This Public Engagement Event featured educational boards on the Proposed and Featured Projects, background information, and an interactive board soliciting feedback on draft community principles for flood protection and the location and identification of specific drainage complaints. A central component of the open house was the projects voting board through which visitors were

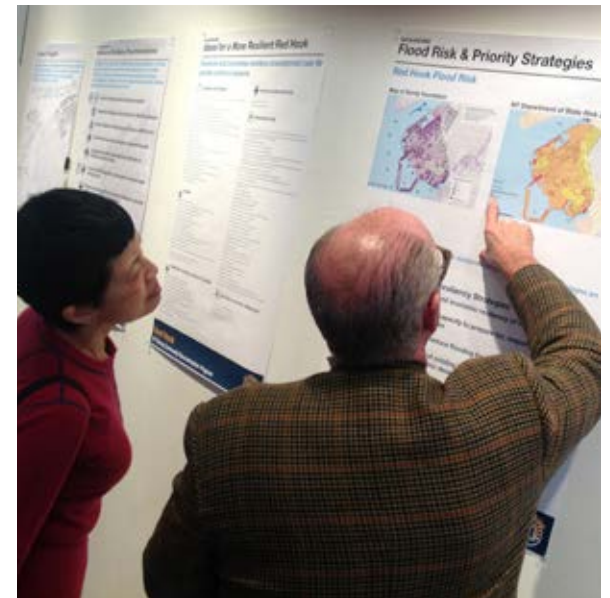
able to indicate their support and opposition to the Proposed Projects with colored stickers. By the end of the two day event, the voting board featured a colorful indication of the public's feedback on the projects and was used to guide selection of Proposed and Featured Projects.

The weekend event included the “Red Hook Resiliency Innovations Session” in which presenters including United States Department of Housing and Urban Development (HUD) Rebuild by Design Program (RBD), Brooklyn Greenway Initiative, Sandy Design Help Desk and Red Hook Initiative Digital Stewards spoke with a packed gallery about local resiliency initiatives in the Community. Another special feature was the presence of the Red Hook Initiative Digital Stewards again as documentarians of the event.

Public Engagement Event #4 (By mid-May 2014)

Presentation of NYRCR Plan

Public Engagement Event #4 will take place by mid-May 2014 and conclude the Public Engagement Event series. At this event the Planning Committee will present the Proposed Projects and the NYRCR Plan to the public.



Public Engagement #3, February 2014.

Source: Carolina Salguero (top)

D. Community asset inventory

The following table provides the assets that were identified through the NYRCR planning process, which were then evaluated using the NYS DOS Asset Inventory and Risk Assessment tool. The table provides the baseline “risk score” for each asset and the scores for the following three risk evaluation components: hazard, exposure, and vulnerability. Hazard scores are based on each asset’s location relative to NYS DOS risk areas and the assumption of a 100-year storm event. Exposure scores are based on landscape attributes, which were determined using publicly available data, aerial imagery, and site reconnaissance. Vulnerability scores are based on information regarding each asset’s performance during and after recovery after Superstorm Sandy and the asset’s current state of repair as described to the Committee, the public, and in some instances, agency stakeholders and reports. More information, including a description of each table attribute, can be found at <http://stormrecovery.ny.gov/resources-0>.

Table V-6 - Asset inventory and risk assessment

Asset Information							Landscape Attributes							Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate	Waterline	Shore defenses	Protective vegetation	Dunes	barrier island or filled wetland	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Van Brunt Street Mixed-Use Corridor	High	Economic	Downtown Center	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	4	42
Clinton Street Mixed-Use Corridor	High	Economic	Downtown Center	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Lorraine Street Mixed-Use Corridor	High	Economic	Downtown Center	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Columbia Street Mixed-Use Corridor	Moderate	Economic	Downtown Center	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.0	3	27
Fairway Supermarket	Extreme	Economic	Industrial, Warehousing and Manufacturing	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	4	54
Ikea	Extreme	Economic	Large Business	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	2	27
Red Hook Container Terminal	Extreme	Economic	Marina/Water Based Business	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41

Asset Information							Landscape Attributes							Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate	Waterline	Shore defenses	Protective vegetation	Dunes	barrier island or filled wetland	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Brooklyn Cruise Terminal	Extreme	Economic	Marina/Water Based Business	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
Erie Basin Barge Port	Extreme	Economic	Marina/Water Based Business	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
Gowanus Bay Terminal (GBX)	Extreme	Economic	Marina/Water Based Business	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
Bukeye Fuel Terminal (former Hess Oil Terminal)	Extreme	Economic	Marina/Water Based Business	No	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
Other Commercial in Extreme Risk Zone (multiple locations)	Extreme	Economic	Small Business	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
Other Commercial in High Risk Zone (multiple locations)	High	Economic	Small Business	0	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
Other Industrial in Extreme Risk Zone (multiple locations)	Extreme	Economic	Industrial, Warehousing and Manufacturing	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
Other Industrial in High Risk Zone (multiple locations)	High	Economic	Industrial, Warehousing and Manufacturing	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
NYCHA Red Hook Houses	High	Housing	Affordable Housing	Yes	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	4	42
Supportive Services/Subsidized Housing (multiple locations)	High	Housing	Supportive Housing	Yes	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32

Asset Information							Landscape Attributes							Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate	Waterline	Shore defenses	Protective vegetation	Dunes	barrier island or filled wetland	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Private Housing in High Risk Zone: Single-Family, Detached (multiple locations)	High	Housing	Single-Family Residence	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	4	42
Private Housing in High Risk Zone: Attached, 2-4 Units (multiple locations)	High	Housing	Multi-Family Residence	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	4	42
Private Housing in High Risk Zone: Multi-Family, 5+ Units (multiple locations)	High	Housing	Multi-Family Residence	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
De Luz Iglesia Crist	High	Health and Social Services	Cultural or Religious Establishments	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Red Hook Initiative	High	Health and Social Services	Non-Profit Organization	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
PS 676 - Red Hook Neighborhood School / Summit Academy Charter School	High	Health and Social Services	Schools	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Red Hook Community Justice Center	High	Health and Social Services	Cultural or Religious Establishments	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	4	42
Calvary Baptist Church	High	Health and Social Services	Cultural or Religious Establishments	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
New Brown Memorial Baptist Church	High	Health and Social Services	Cultural or Religious Establishments	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Iglesia Cristiana Pentecostal	Moderate	Health and Social Services	Cultural or Religious Establishments	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.0	3	27

Asset Information							Landscape Attributes							Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate	Waterline	Shore defenses	Protective vegetation	Dunes	barrier island or filled wetland	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Pave Academy Charter School	High	Health and Social Services	Schools	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	4	42
PS 15 - The Patrick F. Daly School / Red Hook Community Center	High	Health and Social Services	Schools	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	4	42
FDNY: Eng 279, Lad 131	High	Health and Social Services	Emergency Operations/ Response	No	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Bethel Gospel Tabernacle	High	Health and Social Services	Cultural or Religious Establishments	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Iglesia Pentecostal	High	Health and Social Services	Cultural or Religious Establishments	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Yeshiva Kehilath Yakov	High	Health and Social Services	Schools	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Program Development Services, Inc.	High	Health and Social Services	Healthcare Facilities	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Visitation Of The Blessed Virgin Mary Catholic Church	High	Health and Social Services	Cultural or Religious Establishments	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	4	42
Village Center For Care	High	Health and Social Services	Healthcare Facilities	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
The Joseph P. Addabbo Family Healthcare	High	Health and Social Services	Healthcare Facilities	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	4	42
Red Hook Library - Brooklyn Public Library	High	Health and Social Services	Libraries	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	4	42
Avalon Childcare	High	Health and Social Services	Healthcare Facilities	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32

Asset Information							Landscape Attributes							Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate	Waterline	Shore defenses	Protective vegetation	Dunes	barrier island or filled wetland	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Good Shepherd Services, Red Hook Coalition	High	Health and Social Services	Non-Profit Organization	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Bumble Bee Daycare Center	High	Health and Social Services	Healthcare Facilities	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
River Of God Church	High	Health and Social Services	Cultural or Religious Establishments	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Southwest Brooklyn Industrial Development Corporation (SBIDC)	High	Health and Social Services	Government and Administrative Services	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Red Hook Volunteers	High	Health and Social Services	Non-Profit Organization	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
New York Congregation of Jehovahs	High	Health and Social Services	Cultural or Religious Establishments	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
FDNY: Eng 202, Lad 101	High	Health and Social Services	Emergency Operations/ Response	No	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Pal Miccio Day Care Center	Moderate	Health and Social Services	Healthcare Facilities	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.0	3	27
Post Office, Red Hook Station	High	Health and Social Services	Government and Administrative Services	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
NYCHA Miccio Community Center (Red Hook East Community Center)	Moderate	Health and Social Services	Community Center	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.0	3	27
Kentler International Drawing Space	High	Health and Social Services	Non-Profit Organization	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
PortSide NewYork	Extreme	Health and Social Services	Non-Profit Organization	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41

Asset Information							Landscape Attributes							Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate	Waterline	Shore defenses	Protective vegetation	Dunes	barrier island or filled wetland	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Red Hook Rise	High	Health and Social Services	Non-Profit Organization	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Occupy Sandy	Extreme	Health and Social Services	Non-Profit Organization	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
Brooklyn Waterfront Artists Coalition	High	Health and Social Services	Non-Profit Organization	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Carroll Gardens Association	Moderate	Health and Social Services	Non-Profit Organization	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.0	3	27
Harold Ickes Playground	Moderate	Natural and Cultural Resources	Parks and Recreation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.0	2	18
Pioneer Works - Center For Art & Innovation	High	Natural and Cultural Resources	Museums, Performing Arts Centers, Stadiums	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
Coffey Park	High	Natural and Cultural Resources	Parks and Recreation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
Valentino Pier	Extreme	Natural and Cultural Resources	Parks and Recreation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
Pier 44 Waterfront Garden	Extreme	Natural and Cultural Resources	Parks and Recreation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
Erie Basin Park	Extreme	Natural and Cultural Resources	Parks and Recreation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41

Asset Information							Landscape Attributes							Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate	Waterline	Shore defenses	Protective vegetation	Dunes	barrier island or filled wetland	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
Added Value Community Farm	High	Natural and Cultural Resources	Parks and Recreation	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Red Hook Recreation Area	High	Natural and Cultural Resources	Parks and Recreation	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
The Backyard Garden	High	Natural and Cultural Resources	Parks and Recreation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
Summit Street Community Garden	Moderate	Natural and Cultural Resources	Parks and Recreation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.0	2	18
Mother Cabrini Park	Moderate	Natural and Cultural Resources	Parks and Recreation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.0	2	18
The Amazing Garden	Moderate	Natural and Cultural Resources	Parks and Recreation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.0	2	18
Waterfront Museum	High	Natural and Cultural Resources	Museums, Performing Arts Centers, Stadiums	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
Red Hook Recreation Center/Pool	High	Natural and Cultural Resources	Parks and Recreation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	4	42
PS 15 Playground/Recreation Area	High	Natural and Cultural Resources	Parks and Recreation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21

Asset Information							Landscape Attributes							Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate	Waterline	Shore defenses	Protective vegetation	Dunes	barrier island or filled wetland	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
NYCHA Red Hook West Urban Farm	High	Natural and Cultural Resources	Agricultural areas	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
Falconworks Artists Group	High	Natural and Cultural Resources	Non-Profit Organization - arts	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	3	32
Cora Dance Studio	High	Natural and Cultural Resources	Non-Profit Organization - arts	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
Dance Theater Etcetera	Extreme	Natural and Cultural Resources	Non-Profit Organization - arts	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
Brooklyn Waterfront Greenway (Built)	High	Natural and Cultural Resources	Parks and Recreation	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
Brooklyn Waterfront Greenway (Unbuilt)	High	Natural and Cultural Resources	Parks and Recreation	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
Port Authority Facility in Extreme Risk Zone	Extreme	Infrastructure Systems	Transportation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
Port Authority Facility in High Risk Zone	High	Infrastructure Systems	Transportation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
NYCDEP Pump Station	Extreme	Infrastructure Systems	Wastewater	No	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	5	68
New York Water Taxi Docks (multiple locations)	Extreme	Infrastructure Systems	Transportation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41

Asset Information							Landscape Attributes							Risk Assessment			
Asset	Risk Area	Asset Class	Asset Sub-category	Socially Vulnerable Populations	Critical Facility	Community Value	Erosion Rate	Waterline	Shore defenses	Protective vegetation	Dunes	barrier island or filled wetland	Landscape Attribute Score	Hazard Score	Exposure Score	Vulnerability Score	Risk Score
New York Water Taxi Homeport	Extreme	Infrastructure Systems	Transportation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
MTA/TBTA Facility	High	Infrastructure Systems	Transportation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
Hugh L. Carey Tunnel (former Brooklyn Battery Tunnel)	High	Infrastructure Systems	Transportation	No	No, Locally Significant	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	4	42
Gas Station in High Risk Zone	High	Infrastructure Systems	Liquid Fuels	No	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
Gas Stations in Moderate Risk Zone (multiple locations)	High	Infrastructure Systems	Liquid Fuels	No	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
Vehicle Storage Facility in Extreme Risk Zone	Extreme	Infrastructure Systems	Transportation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
Vehicle Storage Facilities in High Risk Zone (multiple locations)	High	Infrastructure Systems	Transportation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
Red Hook Green Power	High	Infrastructure Systems	Power Supply	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	3.5	2	21
Marina	Extreme	Infrastructure Systems	Transportation	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
Working Piers (multiple facilities)	Extreme	Infrastructure Systems	Marine commerce facilities	No	No	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	3	41
Red Hook Wastewater Treatment Plant	Extreme	Infrastructure Systems	Wastewater	No	Yes, FEMA	High	No	Yes	Yes	Yes	Yes	Yes	2.5	3	4.5	2	27

E. Additional regional and local plans

The projects and recommendations proposed by the Planning Committee were analyzed within the context of existing regional, city, and local studies and projects. Relevant efforts include studies, campaigns, projects, and plans that are both directly related to resiliency and emergency preparedness and those that impact community planning in Red Hook. By understanding the wide range of efforts already underway in the community, the Red Hook Planning Committee developed recommendations that build off of existing efforts, fill gaps, and avoid redundancies. The below table of studies, plans, and projects represents a selection of the key regional and local efforts that were considered during the NYRCR process.

Table V-4– Table of additional regional plans and initiatives

Plan/project name	Lead organization(s)	Initiative description	Recovery support functions					
			Community Planning & Capacity Building	Economic Development	Health & Social Services	Housing	Infrastructure	Natural & Cultural Resources
Recovery and resiliency								
A Stronger, More Resilient New York (SIRR Report)	New York City Office of the Mayor	The Special Initiative for Rebuilding and Resiliency (SIRR) convened in December 2012 to assess the total damage wrought by Superstorm Sandy and the implications going forward for the New York City in the wake of climate change and sea level rise. In June 2013, SIRR released its findings in a comprehensive report, A Stronger, More Resilient New York (SIRR Report), which outlined New York City’s plan for rebuilding post-Sandy and ensuring resiliency into the future. The plan contains actionable recommendations for communities affected by the storm as well as chapters covering citywide issues, such as coastal protection, buildings, insurance, utilities, liquid fuels, healthcare, transportation, parks, water and wastewater, and other critical networks.	X	X	X	X	X	X
2014 NYC Hazard Mitigation Plan (HMP)	New York City Office of Emergency (OEM); NYC Department of City Planning (NYC DCP)	The HMP identifies the City’s risk to a range of hazards and identified strategies to reduce the effects of these hazards. Strategies outlined in the report influence all neighborhoods of New York City, including Red Hook.	X					

Plan/project name	Lead organization(s)	Initiative description	Recovery support functions					
			Community Planning & Capacity Building	Economic Development	Health & Social Services	Housing	Infrastructure	Natural & Cultural Resources
Waterfront planning and community planning								
New York City Comprehensive Waterfront Plan—Vision 2020 (CWP)	NYC Department of City Planning (NYC DCP)	The CWP undertakes a comprehensive analysis and overall vision for New York City's 520 miles of shoreline. It includes a strategic framework for the City's waterfront, short- and long-term strategies, and is used to guide land and water use decisions. Priorities in the plan focus on expanding public access, supporting the working waterfront, improving water quality, restoring the ecology of the waterfront, enhancing the Blue Network (the waterways between the five boroughs), and increasing the resiliency of the City in respect to climate change and sea-level rise.						X
Urban Waterfront Adaptive Strategies (UWAS)	NYC Department of City Planning (NYC DCP)	The Urban Waterfront Adaptive Strategies (UWAS) report, prepared by the New York City Department of City Planning, provides a systematic assessment of the coastal flood hazards from climate change and sea-level rise that face New York City. The UWAS lays out a risk-based, flexible process for identifying, evaluating and implementing potential coastal protection strategies. It recognizes that waterfronts vary, and may require a range of strategies at different scales. The report also identifies a range of potential adaptive strategies, and analyzes each for their ability to protect waterfront communities.						X
New York City Waterfront Revitalization Program (WRP)	NYC Department of City Planning (NYC DCP)	The New York City Waterfront Revitalization Program (WRP) is the city's principal coastal management tool, and implements the CWP. It establishes the City's policies for development and use of the waterfront, and provides the framework for evaluating the consistency of all discretionary actions in the coastal area. When a proposed project is located in the City's designated waterfront area, and it requires a local, state, or federal discretionary action, a determination of the project's consistency with the policies and intent of the WRP must be made before the project can move forward. In October 2013, the New York City Council approved revisions to the WRP that aim to improve projects within the coastal zone through promoting climate resilient designs, increasing public access to the waterfront when appropriate and achievable, and improving interagency coordination to foster a clear, predictable development process.						X

Plan/project name	Lead organization(s)	Initiative description	Recovery support functions					
			Community Planning & Capacity Building	Economic Development	Health & Social Services	Housing	Infrastructure	Natural & Cultural Resources
WAVES Action Agenda & Brooklyn Waterfront Greenway Plan	NYC Department of Transportation (NYC DOT)	The WAVES Action Agenda recommends initiatives throughout the City. One recommendation is to build a multi-use path to connect Atlantic Basin to the Brooklyn Waterfront Greenway.					X	
Designing for Flood Risk	New York City Department of City Planning (NYC DCP)	Designing for Flood Risk identifies key principles to guide the design of new buildings in flood zones so that construction will be more resilient to the effects of climate change and coastal flood events. Recognizing the distinct character and needs of higher-density urban environments, the report provides recommendations for how regulations and individual project design can incorporate these principles. The study informed the Department of City Planning's Flood Resilience Zoning text amendment adopted by City Council in 2013.		X		X		
Historic Landmarks and Flood Risk Study	New York City Department of City Planning (NYC DCP)	The study aims to determine the impact to and risks faced by historic landmarks in New York City and to identify retrofitting strategies for increasing the resilience of historic structures while maintaining their historic integrity. The study summarizes the policy implications of changes to the National Flood Insurance Program (NFIP).		X		X		
Economic development								
New York City Regional Economic Development Council's Five-Year Strategy Plan	New York City Regional Economic Development Council	New York City Regional Economic Development Council's Five-Year Strategy Plan was utilized to help inform NYRCR Program analysis. This plan identified strategies for accelerating job growth and economic development in the region. The Council outlines four key objectives to address these principles: improve quality of life; create a pro-growth, pro-jobs environment; invest in the future; and foster innovation and inter-regional cooperation. Specific approaches such as supporting small businesses and neighborhood revitalization align with the goals of NYRCR.		X				
Neighborhood Game-Changer Investment Competition - Red Hook	New York City Economic Development Corporation (NYCEDC)	NYCEDC launched a \$90,000,000 competition for development of "game-changing" projects that will enhance the vitality, connectivity, and economic strength of areas impacted by Superstorm Sandy including Red Hook.		X				

Plan/project name	Lead organization(s)	Initiative description	Recovery support functions					
			Community Planning & Capacity Building	Economic Development	Health & Social Services	Housing	Infrastructure	Natural & Cultural Resources
Business Resiliency Investment Program (BRIP)	New York City Economic Development Corporation (NYCEDC)	The Business Resiliency Investment Program (BRIP) is a \$110 million CDBG-DR-funded program that will provide funds to both business tenants and owners to make improvements that enhance resiliency to severe weather-related events. It will focus on funding a portion of the incremental costs of one or more "Approved Resiliency Measures" through grants and loans; the program focuses on funding resiliency improvements and not repairs.		X				
HUD Rebuild by Design (RBD) - HR&A/CRP Red Hook commercial corridor resiliency	U.S. Department of Housing and Urban Development (HUD); HR&A Advisors; Cooper, Robertson, & Partners	The HUD Rebuild by Design (RBD) competition seeks to uncover replicable and innovative resiliency solutions for homes/neighborhoods. Through the competition multiple design teams are developing design solutions in communities in New York and New Jersey that were impacted by Superstorm Sandy. The HR&A Advisors/CRP team is exploring resiliency solutions in Red Hook and three other locations to ground a retail corridor protection plan. Proposed projects from phase one of the competition include: flood protection for existing stores and buildings along Van Brunt Street; an increase in commercial activity on higher ground on Columbia Street, connecting the neighborhood on the waterfront with Red Hook Houses and encouraging denser development along both corridors; development of new public housing to relocate ground floor tenants to higher elevations in new structures; and connecting Red Hook north to Brooklyn neighborhoods along Columbia Street through reconfiguration and flood protection of the Hugh L. Carey (Brooklyn-Battery) Tunnel.		X				
Housing								
NYCHA - Repairs and resiliency projects	New York City Housing Authority (NYCHA)	NYCHA has undertaken broad repairs in properties affected by Sandy. In Red Hook Houses, analysis is underway to study feasibility of providing on-site, elevated back-up generators.				X		

Plan/project name	Lead organization(s)	Initiative description	Recovery support functions					
			Community Planning & Capacity Building	Economic Development	Health & Social Services	Housing	Infrastructure	Natural & Cultural Resources
Weathering the Storm: Rebuilding a More Resilient New York City Housing Authority Post-Sandy	Alliance for a Greater New York (ALIGN), Alliance for a Just Rebuilding (AJR), Community Voices Heard, Faith in New York, Families United for Racial and Economic Equality (FUREE), Good Old Lower East Side (GOLES), New York Communities for Change, and Red Hook Initiative	This report assesses how NYCHA residents living in storm-affected zones are faring after Superstorm Sandy and proposes solutions for how NYCHA and the City can address the issues exposed by Sandy. For this research, participating community groups surveyed public housing residents living in NYCHA buildings in Red Hook, Coney Island, Lower East Side, Far Rockaway, and Gowanus. The report includes research findings and recommendations.				X		
Transportation								
Red Hook Transportation Study	NYC Department of City Planning (NYC DCP)	The purpose of this study, which will be completed in Spring 2014, is to develop a transportation plan to improve access, mobility and safety for Red Hook. The project goals are to connect Red Hook to other neighborhoods and to improve streets, transit, safety, and traffic flow. Preliminary recommendations include bike and pedestrian improvements, increasing transit access, and improving street conditions.					X	
2010 Comprehensive Citywide Ferry Study	NYC Economic Development Corporation (NYCEDC)	This study provided an overview of development potential for passenger ferry transportation throughout New York City. The planning study analyzed and prioritized potential routes drawn from a group of over forty waterfront sites in the five boroughs. As discussed in the study, enhanced ferry service in Red Hook could provide multiple local and regional benefits, including increased access to a variety of destinations in Red Hook, as well as substantial reductions in commuting time to Manhattan, which could further increase the neighborhood's attractiveness.					X	

Plan/project name	Lead organization(s)	Initiative description	Recovery support functions					
			Community Planning & Capacity Building	Economic Development	Health & Social Services	Housing	Infrastructure	Natural & Cultural Resources
2013 Comprehensive Citywide Ferry Study	NYC Department of Environmental Protection (NYC DEP)	The Preliminary Report, which is a precursor to the Final Report that is anticipated to be released in Spring 2014, comprises an updated and expanded Citywide Ferry Study. The goals of this effort are to identify new ferry service opportunities and to increase understanding of the economic impacts and potential of this emerging transportation resource in New York City. The 2013 study is also intended to develop a planning framework based on several transportation models that can be used on an ongoing basis by public or private sector stakeholders to assess future ferry service opportunities. The study takes a fresh look at the potential for enhanced ferry service in Red Hook, including consideration of a new site at Valentino Pier as well as the site at the foot of Van Brunt Street. One of the six main routes that were identified for the second phase of modeling included the Van Brunt Street site as a stop (with service from Bay Ridge to Red Hook to Pier 6 / Brooklyn Bridge Park to Pier 11 / Wall Street); the Valentino Pier site was not advanced to this second phase of modeling.					X	
Ferry Policy and Planning in New York City: Considerations for a Five-Borough Ferry System	NYC Department of Environmental Protection (NYC DEP)	In conjunction with the Citywide Ferry Study update, this paper provides a preliminary road map for expansion to a five-borough ferry system, building on lessons learned and defining best practices. Specifically regarding Red Hook, the report states that daily, year-round service to this transit-challenged community would make Red Hook accessible to Manhattan and other Brooklyn neighborhoods. In addition, ferry service can spur or complement new investment along the industrial waterfront, where a former beverage warehouse is now slated for development into a technology, media, and fashion center.					X	
Brooklyn Streetcar Feasibility Study	NYC Department of Transportation (NYC DOT)	This study evaluated the feasibility of running a streetcar route to serve the neighborhood of Red Hook. The intent of the study was to determine the current and future transportation needs of Red Hook and identify whether a streetcar can effectively meet these needs. The study concluded that the existing conditions of Red Hook are not conducive to a streetcar route, due to a combination of physical constraints, potential conflicts, and density and mix of land uses.					X	

Plan/project name	Lead organization(s)	Initiative description	Recovery support functions					
			Community Planning & Capacity Building	Economic Development	Health & Social Services	Housing	Infrastructure	Natural & Cultural Resources
New York-New Jersey-Connecticut Hurricane Sandy Follow-up and Transportation Vulnerability Assessment and Adaptation Analysis Project	FHWA; New York, New Jersey and Connecticut Departments of Transportation; North Jersey Transportation Planning Authority (NJTPA); New York Metropolitan Transportation Council (NYMTC); South Western Regional Planning Agency (SWRPA); Greater Bridgeport Regional Council (GBRC)	This research project, initiated by Federal Highway Administration (FHWA), will examine the impacts on the transportation system from Hurricanes Sandy and Irene and Tropical Storm Lee and identify strategies to protect select transportation assets from the impacts of extreme weather and climate change. The Hugh L. Carey Tunnel is one of 10 transportation assets that were chosen for additional engineering assessment to identify adaptation measures that could reduce vulnerability.					X	
Metropolitan Transportation Authority (MTA) Capital Needs Assessment 2015-2034	Metropolitan Transportation Authority (MTA)	The 20-year capital needs assessment establishes the planning context prior to the development of five-year capital programs for the MTA. As discussed in the document, MTA's goal is to maintain a transportation system that is resilient to future natural hazards and the impacts of possible climate change.					X	
New York Metropolitan Transportation Council (NYMTC) Plan 2040 Regional Transportation Plan (RTP)	New York Metropolitan Transportation Council (NYMTC)	Adopted in September 2013, this plan includes the NYMTC members' vision for the planning area and lays out the long-range framework for maintaining and improving the region's transportation system. One of seven "shared goals" of the NYMTC members is to improve the resiliency of the regional transportation system. As discussed in the document, NYMTC's members will continue to plan for improving the resiliency of the transportation system so that the system can better resist disruptions to services and facilities and recover from them when they occur.					X	
McAllister Transportation build an ATB container barge service	McAllister Transportation, Maine Port Authority	Federal MARAD is funding a project by Maine Port Authority to have McAllister Transportation build an ATB container barge service that will run between Red Hook and Maine.					X	

Plan/project name	Lead organization(s)	Initiative description	Recovery support functions					
			Community Planning & Capacity Building	Economic Development	Health & Social Services	Housing	Infrastructure	Natural & Cultural Resources
Drainage, water management, and natural resources								
Dredged Materials & Climate Change Pilot Project: Technology, Applications and Demonstration Project - Phase 1	PANYNJ and Nautilus	The Port Authority of New York & New Jersey (PANYNJ) is exploring the beneficial reuse of dredged materials in ways that are environmentally sustainable and can improve coastal resiliency through the Dredged Materials & Climate Change Pilot Project. During the first phase, the pilot is aimed at 1) analyzing state-of-the-art technologies for the reuse of dredged materials, 2) evaluating a range of possible applications that could help address climate change, and 3) proposing a future demonstration project on southwest Brooklyn’s waterfront.					X	X
NYC Wastewater Resiliency Plan: Climate Risk Assessment and Adaptation Study	NYC Department of Environmental Protection (NYC DEP)	Building upon previous studies, this climate risk assessment and adaptation study sets forth cost-effective strategies for reducing flooding damage to wastewater infrastructure and safeguarding public health and the environment. This comprehensive study examined buildings and infrastructure at DEP’s 96 pumping stations and 14 wastewater treatment plants, identifying and prioritizing infrastructure that is most at risk of flood damage. Recommended adaptation strategies specific to Red Hook include elevating electrical equipment in a new building for the Van Brunt Street Pumping Station (\$2.75M) and a set of 10 recommendations for the Red Hook Wastewater Treatment Plant (\$18.6M).					X	
Special Initiative for Rebuilding and Resiliency (SIRR) Analysis - Environmental Justice Alliance	Sandy Regional Assembly, Environmental Justice Alliance (NYC-EJA)	Report analyzes proposals made by the SIRR Report and provides supplemental recommendations aimed at addressing environmental justice and social justice issues. Proposals relevant to Red Hook include providing funding for the Red Hook Significant Maritime Industrial Area (SMIA), expediting the remediation of the Gowanus Canal, and establishing a Community Resilience Center.	X	X	X	X	X	X

Table V-5– Table of local plans and initiatives

Plan/project name	Lead organization(s)	Initiative description	Recovery support functions					
			Community Planning & Capacity Building	Economic Development	Health & Social Services	Housing	Infrastructure	Natural & Cultural Resources
Recovery and resiliency								
Red Hook Summit	Red Hook Coalition	In 2013 the Red Hook Coalition convened a summit aimed at articulating a vision for Red Hook, catalyzing change, developing a strategy, and engaging a core group of new community voices in leadership. The Red Hook Coalition has since been undertaking a number of emergency preparedness and response efforts.	X					
Disaster preparedness model development and long term emergency planning	Red Hook Coalition; Good Shepard Services; Red Hook Volunteers; Southwest Brooklyn Industrial Development Corporation (SBIDC); Added Value Farm; Red Hook Initiative; Dance Theater; Etcetera	The Red Hook Coalition is developing a long-term community recovery and emergency preparedness plan that will be a NYC Office of Emergency Preparedness (NYC OEM) recognized document. This document will identify necessary mitigation, select projects to be undertaken, assign champions, and develop strategies to implement the plan. It is hoped that the development of this plan can become a replicable model of disaster preparedness and community planning. Supplementing this planning effort the Red Hook Coalition will help coordinate a teen Community Emergency Preparedness Team (CERT) training program that will engage youth in disaster preparedness planning.	X		X			
Red Hook WiFi	The Digital Stewards, Red Hook Initiative (RHI)	A community-wide WiFi network was developed by the Red Hook Initiative involving neighbors and volunteers. Well over 18 wireless routers have been installed at businesses and non-profits, extending the coverage to all of the main corridors in Red Hook. This program is now being elevated as an example for both disaster response and access expansion regionally and nationally.	X				X	
Shelter in the Storm: the Community-Based Response to Sandy	Red Hook Initiative (RHI); North Star Fund	A study by North Star Fund in collaboration with Red Hook Initiative will document the Red Hook community's response in the immediate wake of Superstorm Sandy. Preliminary findings of the report provide an initial look at how non-profits were critical actors in the response effort. The final study will be released in April 2014 and may help inform resiliency and emergency preparedness strategies.	X					

Plan/project name	Lead organization(s)	Initiative description	Recovery support functions					
			Community Planning & Capacity Building	Economic Development	Health & Social Services	Housing	Infrastructure	Natural & Cultural Resources
AIGA Design/Relief competition	AIGA	This design initiative is aimed at creating replicable models of increasing resiliency through design and graphic design. In Red Hook, the team is exploring possible locations for an emergency communications hub. This analysis has been coordinated with NY Rising conversations about the need to develop a relief center network.	X					
Community planning								
Columbia University, Historic Preservation Graduate Program	A Preservation Plan for Red Hook Brooklyn	A graduate student report developed in 2009 identifies the location of key historic assets in Red Hook and analyzes opportunities for preservation. The report helps establish a baseline knowledge of historic assets in Red Hook.		X		X		
Red Hook: A Plan for Community Regeneration - Community Board 6 - 197-a Plan	Community Board 6	A comprehensive neighborhood plan released in 1996 by Community Board 6 provides a thorough analysis of many conditions and critical issues in Red Hook. The plan presents a number of recommendations for transportation, housing, open space, economic development, community facilities and services that are still relevant.	X	X	X	X	X	
Council District 38 Participatory Budgeting exercise	Council District 38	Councilmember Carlos Menchaca launched a participatory budgeting (PBNYC) process in Red Hook and Sunset Park, giving residents the power to determine how \$2million is spent. Some of the projects being discussed through this process include projects to enhance emergency preparedness such as purchase of back-up generators. The final vote on projects to be funded through this process occurs at the end of March 2014.	X	X	X	X	X	
Economic development								
Red Hook Brownfield Opportunity Area (BOA) Program pre-nomination analysis	New York City Department of City Planning (DCP)	As a first step of the BOA Program, preliminary analysis of existing conditions and justification of study area boundaries are undertaken. Information on land use, demographics, overview of flood risk to industrial properties in the proposed brownfield area, and other background material was compiled		X				X

Plan/project name	Lead organization(s)	Initiative description	Recovery support functions					
			Community Planning & Capacity Building	Economic Development	Health & Social Services	Housing	Infrastructure	Natural & Cultural Resources
Red Hook Small Business Hazard Mitigation Case Study Findings Report	Southwest Brooklyn Industrial Development Corporation (SBIDC) and Dewberry	The report presents findings from an analysis of three businesses in Red Hook that were impacted by Sandy. Both physical and operational aspects of the businesses and their recovery needs are addressed. Supplementing the report are the Small Business Storm Preparedness Plan and a list of national funding opportunities for hazard mitigation.		X				
Restore Red Hook	Restore Red Hook	Restore Red Hook was formed in the wake of Superstorm Sandy to provide needed financial assistance to small businesses in Red Hook. In cooperation with the Fund for the City of New York, the program has raised close to \$500,000 for businesses. In December 2012 the program was able to award grants of \$4,000 each to approximately 50 local businesses.		X				
Recovery, Adaption, Mitigation and Planning (RAMP) Studio – Southwest Brooklyn Resilience, Education, Training and Innovation (RETI) Center	Pratt Graduate Studio	Pratt Institute's Programs for Sustainable Planning and Development (PSPD) developed a suite of studios, classes, and workshops that address resiliency issues. A summer course, "Repositioning in Place: Strategies for a Resilient Red Hook" analyzed resiliency challenges in Red Hook and ongoing graduate studies are addressing resiliency issues in Red Hook. The "RETI Model" is Brooke Mayer's graduate project looking at the feasibility of a job training program in Red Hook modeled after the Rotterdam, Netherlands Rotterdamsche Droogdok Maatschappij (RDM) program. The RDM program provides low and high tech workforce training in broad range of manufacturing industries and including resiliency and energy efficiency curriculum.		X				
Columbia Waterfront District Commercial Corridor Vision	Carroll Gardens Association	A visioning exercise is being undertaken to improve the Columbia Waterfront District commercial corridor.		X				
Housing								
Fifth Avenue Committee housing needs assessment	Fifth Avenue Committee (FAC)	Fifth Avenue Committee is undertaking a housing needs assessment in Red Hook to determine key resiliency needs in the neighborhood. A Housing Recovery Coordinator is coordinating survey efforts and the subsequent response.	X			X		

Plan/project name	Lead organization(s)	Initiative description	Recovery support functions					
			Community Planning & Capacity Building	Economic Development	Health & Social Services	Housing	Infrastructure	Natural & Cultural Resources
Sandy Design Help Desk	Fifth Avenue Committee (FAC); Enterprise Community Partners; Architecture for Humanity; New York City Housing Recovery Office (HRO)	A weekend workshop, staffed by volunteer architects, provided pro-bono assistance to Red Hook homeowners/building owners addressing questions about resiliency upgrades and repairs. The workshop was able to assist 12 property owners and highlighted the key challenges that homeowners are facing in repair/resiliency work.				X		
Gowanus Houses tenant disaster training program	Fifth Avenue Committee (FAC); Families United for Racial and Economic Equality (FUREE)	The disaster preparedness project will engage and train tenants in Gowanus Houses on climate change, disaster planning and recovery; create a community hub; and develop a disaster preparedness plan and training program for volunteers to respond in disasters	X			X		
Transportation								
Brooklyn Waterfront Greenway route	Brooklyn Greenway Initiative (BGI); Regional Plan Association (RPA)	Brooklyn Greenway Initiative (BGI) in partnership with Regional Plan Association (RPA) has been selecting, designing and implementing a 14-mile recreational trail along the Brooklyn waterfront. Many sections of the Brooklyn Waterfront Greenway in Red Hook are yet to be built out and there are opportunities for implementing resiliency components in these sections. As part of BGI's work, they have undertaken studies and implemented projects along the route that address stormwater runoff issues. The findings of these studies and results of these interventions are relevant to resiliency planning going forward. Additionally the Greenway route may be a part of the recently announced integration flood protection system in Red Hook.					X	X
Mill Street crossing and extension	NYC Department of Transportation (DOT)	In November 2013, NYC DOT opened an extension of Mill Street across Hamilton Avenue between Red Hook and Carroll Gardens. Improvements include: new Mill Street roadway and sidewalk underneath the Gowanus Expressway; new traffic signals with crosswalks at Mill Street/Hamilton Avenue and Garnet Street/Court Street; Garnet Street reversed from Westbound to Eastbound between Hamilton Avenue and Court Street; B61 eastbound and B57 northbound buses rerouted via Mill Street; and bike lane on Mill Street/Garnet Street between Clinton Street and Smith Street.					X	

Plan/project name	Lead organization(s)	Initiative description	Recovery support functions					
			Community Planning & Capacity Building	Economic Development	Health & Social Services	Housing	Infrastructure	Natural & Cultural Resources
Assorted DDC Capital Projects and NYC DOT 10 Year Capital Plan Projects (in Red Hook)	NYC Department of Design and Construction (DDC); NYC Department of Environmental Protection (DEP); NYC Department of Transportation (NYC DOT)	Assorted capital transportation projects planned, underway, or recently completed include: Reconstruction of Columbia Street, Phase II/BED768B/SEK002321 (HWK700B) Reconstruction of Columbia Street/BED768 (HWK700A) Brooklyn Waterfront Greenway: Sunset Park Connector (HWK1048D) Retaining wall - Hamilton Avenue westbound (RWK017) - east of Smith Street Retrofit/upgrade of asphalt plant at Hamilton Avenue (HWKF2007) Hamilton Avenue/Gowanus Canal (BIN 2-24023)					X	X
Drainage, water management, and natural resources								
DDC Capital Projects (in Red Hook)	NYC Department of Design and Construction (DDC); NYC Department of Environmental Protection (NYC DEP)	Assorted repairs and rehabilitation of intercepting sewers is being undertaken in Red Hook.					X	
IKEA Environmental Impact Statement (EIS)	IKEA	The final EIS report provides information on brownfield remediation and environmental impacts of development of site. Information on possible drainage impacts is also included.		X			X	
Recovery, Adaption, Mitigation and Planning (RAMP) Studio - Waste to Energy in Red Hook	Pratt Graduate Studio	Pratt Institute's Programs for Sustainable Planning and Development (PSPD) developed a suite of studios, classes, and workshops that address resiliency issues. A summer course, "Repositioning in Place: Strategies for a Resilient Red Hook" analyzed resiliency challenges in Red Hook. Graduate student coursework has continued. Josh Eichen's graduate study project looks at the sewer system in Red Hook, providing great background information on the system, 311 complaints, the direction of sewage pumping, and then proposing a waste to energy system that would allow residents to profit from waste.					X	
Gowanus Canal SPONGE PARK	NYC Department of Environmental Protection (NYC DEP)	The Sponge Park is being developed along the Gowanus Canal. The park is designed to serve a bioremediation function and also provide open space.						X

Plan/project name	Lead organization(s)	Initiative description	Recovery support functions					
			Community Planning & Capacity Building	Economic Development	Health & Social Services	Housing	Infrastructure	Natural & Cultural Resources
Gowanus Superfund Site	U.S. Environmental Protection Agency (EPA)	The U.S. Environmental Protection Agency has finalized its plan to clean up the Gowanus Canal Superfund site. The final plan includes removing contaminated sediment that has accumulated as a result of industrial and sewer discharges from the bottom of the canal by dredging. The dredged areas will be capped. The plan also includes controls to prevent combined sewer overflows, or CSOs, and other land-based sources of contamination from compromising the cleanup.					X	X
DDC Capital Projects (for Red Hook)	NYC Department of Design and Construction (NYC DDC) and Mayor's Office of Operations	Project to remediate petroleum contaminated sites (PW348-52)					X	X

F. Endnotes

Foreward

1 Five of the 102 localities in the program—Niagara, Herkimer, Oneida, Madison, and Montgomery Counties—are not funded through the CDBG-DR program.

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Section IV

0 (1) Construction costs have been provided by VJ Associates, a construction cost consulting firm. To provide cost estimates that account for the preliminary level of design work that has been conducted, conservative markups were included. As a percentage of estimated hard costs these include: general requirement (10%), general contractor overhead and profit (21%), design contingency (25%), soft cost allowance (30%), and 3% annual escalation. (2) Certain components of building hardening costs were provided by Dewberry, an architecture and engineering firm. (3) All construction job estimates are based on local

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G. Glossary

(ABFE) Advisory Base Flood Elevation

The preliminary published computed elevation resulting from floodwater that has a 1% chance of equaling or exceeding that level in a given year.

(ADA) Americans with Disabilities Act

A law enacted by U.S. Congress that prohibits discrimination against people with disabilities in employment, transportation, public accommodation, communications, and government activities.

(AIGA) The Professional Association for Design

A national organization whose mission is to move the field of design forward worldwide via education and professional development.

(BFE) Base Flood Elevation

The computed elevation resulting from floodwater that has a 1% chance of equaling or exceeding that level in a given year.

(BGI) Brooklyn Greenway Initiative

A nonprofit organization that organizes planning for the 14-mile Brooklyn Waterfront Greenway and its long-term stewardship.

(BRIP) New York City Business Resiliency Investment Program

A \$110 million CDBG-DR-funded program that will be implemented by New York City Economic Development Corporation (NYCEDC) and will provide funds to both business tenants and building owners to make improvements that enhance resiliency to severe weather-related events.

(CBO) Community-Based Organization

A nonprofit organization that operates within a local community.

(CDBG-DR) Community Development Block Grant-Disaster Recovery

Federal grants administered by the U.S. Department of Housing and Urban Development (HUD) and allocated to cities, counties and States to facilitate rebuilding and recovery of disaster areas as designated by the President of the United States.

(CDFI) Community Development Financial Institution

A financial institution that provides credit and financial services within underserved markets and communities.

(CERT) Community Emergency Response Team

An organization composed of volunteers trained and tasked with providing supplementary emergency care during a major disaster.

(CSO) Combined Sewer Overflow

Water pollution caused by large variations of flow in a sewer system that collects both sanitary sewage and stormwater runoff in a single pipe system.

(DHSES) Division of Homeland Security and Emergency Services

New York State governmental agency responsible for coordination and support of counter-terrorism, emergency management, fire prevention and control, and interoperable and emergency communications.

(EPA) Environmental Protection Agency

The U.S. Federal government agency responsible for the protection of human health and the environment through the enforcement of regulations passed by the U.S. Congress.

(FDNY) Fire Department of New York

The New York City governmental agency responsible for providing first responders to fires, public safety and emergency situations, disasters, and terrorist acts.

(FEMA) Federal Emergency Management Agency

An agency within the U.S. Department of Homeland Security responsible for the coordination of the response to a state-of-emergency-declared disaster.

(FIRMs) Flood Insurance Rate Maps

The official map of a community used by FEMA to delineate a community's base flood elevations, flood zones, and floodplain boundaries.

(HUD) United States Department of Housing and Urban Development

The U.S. Federal government executive department responsible for executing Federal policies on housing and metropolises.

(MTA) Metropolitan Transportation Authority

A public benefit corporation responsible for providing public transportation in 12 counties in southeastern New York and two counties in southwestern Connecticut.

(NFIP) National Flood Insurance Program

A FEMA-run program that provides government-sponsored flood insurance to homeowners, renters and business owners.

(NYC DCP) New York City Department of City Planning

The New York City governmental agency responsible for the strategic development of the City's physical and socioeconomic planning.

(NYC DDC) New York City Department of Design and Construction

The New York City governmental agency responsible for the construction of civic facilities in New York City.

(NYC DEP) New York City Department of Environmental Protection

The New York City governmental agency responsible for providing the City's water supply, managing the City's wastewater system, and regulating the City's environment, including air quality, hazardous waste, and quality of life issues.

(NYC DOB) New York City Department of Buildings

The New York City governmental agency responsible for the enforcement of building codes and zoning regulations, the issuance of building permits, and the inspection of new and existing building.

(NYC DOT) New York City Department of Transportation

The New York City governmental agency responsible for the management of the City's transportation infrastructure.

(NYC OEM) New York City Office of Emergency Preparedness

The New York City governmental agency responsible for preparation, coordination, and education of emergency response and recovery.

(NYC WRP) New York City Waterfront Revitalization Program

New York City's established protocol for waterfront management and development and uses whose purpose as an evaluative tool is to ensure the alignment of maritime activities and potential coastal projects with local, state, and federal guidelines by means of a review process.

(NYCEDC) New York City Economic Development Corporation

The City's official economic development organization charged with leveraging the City's assets to promote economic growth.

(NYCHA) New York City Housing Authority

A public authority responsible for administering public housing for low- and moderate-income residents in New York City.

(NYRCR) NY Rising Community Reconstruction

A program established by Governor Andrew M. Cuomo to provide additional rebuilding and revitalization assistance to communities damaged by Superstorm Sandy, Hurricane Irene, and Tropical Storm Lee.

(NYS DEC) New York State Department of Environmental Conservation

The New York State governmental agency responsible for the conservation, improvement, and protection of natural resources; the management of State-owned lands; and the regulation of environmental laws and regulations.

(NYS DOS) New York State Department of State

The New York State governmental agency responsible for strategic investment in the revitalization and economic growth of regions.

(NYS DOT) New York State Department of Transportation

The New York State governmental agency responsible for the development and management of State transportation infrastructure.

(NYS EFC) New York State Environmental Facilities Corporation

A public benefit corporation responsible for promoting compliance with environmental regulations and facilitating environmental and

sustainable projects through the provision of capital and technical assistance to cities, nonprofit organizations, and small businesses.

(NYS PSC) Public Service Commission

The New York State governmental agency responsible for the regulation of utilities in the State.

(NYS SHPO) New York State's Historic Preservation Office

The New York State governmental agency responsible for helping identify, evaluate, preserve, and revitalize historic, archeological, and cultural resources.

(NYSERDA) New York State Energy Research and Development Authority

A public benefit corporation tasked with helping New Yorkers increase energy efficiency via the implementation of reduced consumption and the use of renewable energy sources.

(PANYNJ) Port Authority of New York and New Jersey

A joint agency between the States of New York and New Jersey responsible for the development and maintenance of regional transportation and the World Trade Center site.

(PMAZ) Priority Marine Activity Zone

A zone, designated for New York City Waterfront Revitalization Program (NYC WRP) projects, defined by a large quantity of waterborne modes of transit and infrastructure related to maritime functions.

(RAMP) Pratt Institute's Recovery, Adaptation, Mitigation, and Planning Program

A series of interdisciplinary courses and workshops at Pratt Institute launched the summer of 2013 and related to coastal communities affected by Superstorm Sandy in New York City and surrounding areas.

(RBD) United States Department of Housing and Urban Development (HUD) Rebuild by Design Program

A competition overseen by HUD that tasks a team of design professionals with analyzing potential organizational structures and incentive tools to implement resiliency upgrades in Superstorm Sandy-affected regions.

(RDM) Rotterdamsche Droogdok Maatschappij Program

The former shipyard of the Rotterdam Dry Dock Company in Rotterdam, the Netherlands; the industrial maritime space now serves as a cooperative hub for innovation among higher and vocational education institutions, companies, and the Port of Rotterdam Authority.

(REES) Resident Economic Empowerment and Sustainability Program

An office within the New York City Housing Authority (NYCHA) that develops and implements programs to support residents' economic opportunities.

(RFP) Request for Proposals

A bidding process by which an agency or business outlines a procurement of services and accepts solicitations from potential suppliers.

(RPA) Regional Plan Association

An independent, not-for-profit regional planning association for the New York-New Jersey-Connecticut metropolitan region.

(SBA) U.S. Small Business Association

An independent Federal agency responsible for providing support to small businesses and entrepreneurs.

(SBIDC) Southwest Brooklyn Industrial Development Corporation

A not-for-profit organization that provides advocacy and services to businesses in Red Hook, Sunset Park, and Gowanus.

(SIRR Report) A Stronger, More Resilient New York

A comprehensive City plan commissioned by former Mayor Michael Bloomberg detailing actionable recommendations for the rebuilding and increased resiliency of communities and infrastructure impacted by Superstorm Sandy.

(USACE) United States Army Corps of Engineers

The U.S. Federal agency under the Department of Defense composed of civilian and military personnel and responsible for providing public and military engineering services.

(WWTP) Red Hook Wastewater Treatment Plant

A wastewater treatment plant, located in Red Hook, with a drainage area of 3,200 acres covering northwestern Brooklyn and Governor's Island.



NY Rising
Community Reconstruction Program

