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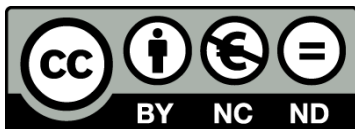**School of Architecture**

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The resilience balancing act: how New York has balanced built environment and community approaches in it's resilience framework

Thomas Schiefer

MASTER THESIS

THE RESILIENCE BALANCING ACT:

How New York has Balanced Built Environment and Community Approaches in its Resilience Framework

2018/2019 Academic Year

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Abbreviations

CBO - Community Based Organization

GOSR - Governor's Office of Storm Recovery

NYC - New York City

NYCDEP - New York City Department of City Planning

NYCEDC - New York City Economic Development Corporation

NYCHA - New York City Housing Authority

NYRCR - New York Rising Community Reconstruction

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Abstract

Ensuring that cities are resilient against increasing risks of flooding is one of the greatest challenges for planners, especially within coastal cities like New York. Current literature has examined different pathways to resilience, including strengthening the built environment and enhancing community social capital and bonds. Relatively little attention has been paid, however, to how different local governments have balanced these two strategies within their resilience framework. This paper explores the balance of built environment and community approaches within resilience measures proposed in the 2014 New York Rising Community Reconstruction Program and from the Mayor's Office for three New York neighborhoods: Lower Manhattan, Red Hook (Brooklyn), and Breezy Point (Queens). The research sought to determine what neighborhood factors influence how local governments balance these two approaches. The research was performed via a desk review of government reports, news media, and academic journals to assess community social capital and neighborhood relevance to city development goals. These results were triangulated by responses to a survey among residents of each neighborhood. The findings were that stronger bias towards a built environment approach is linked to weak community social capital and high development interest for the city. Neighborhoods with strong community social capital and low development interest for the city, however, can leverage their strong organizational bonds to push for more built environment investment. These findings provide needed insight for how local governments opt to protect different coastal neighborhoods..

1.0 Introduction

Over the last century, the world's population has increasingly settled in coastal, flood-prone cities. Human-made climate change leads to rapidly increasing yet unpredictable risks for these low-lying cities. As a result, city and regional governments seeking ways to ensure that urban systems, populations, and assets are protected against an intensified array of climate-related hazards. When Superstorm Sandy struck New York City in October of 2012, it demonstrated that even with modern infrastructure and advanced tracking systems, many of the world cities are extremely vulnerable. Climate resilience initiatives had been pioneered by former New York Mayor Michael Bloomberg as early as 2008. However 49 deaths deaths, an estimated $42 billion of damage, and extreme disruption due to Superstorm Sandy in New York State, mostly concentrated in New York City, enshrined the need for a more serious and integrated effort to build New York into a more resilient city. (Goodall, 2016; Kaplan & Hernandez, 2016) Figure 1 illustrates the expanse of land that the city government views as being at risk.
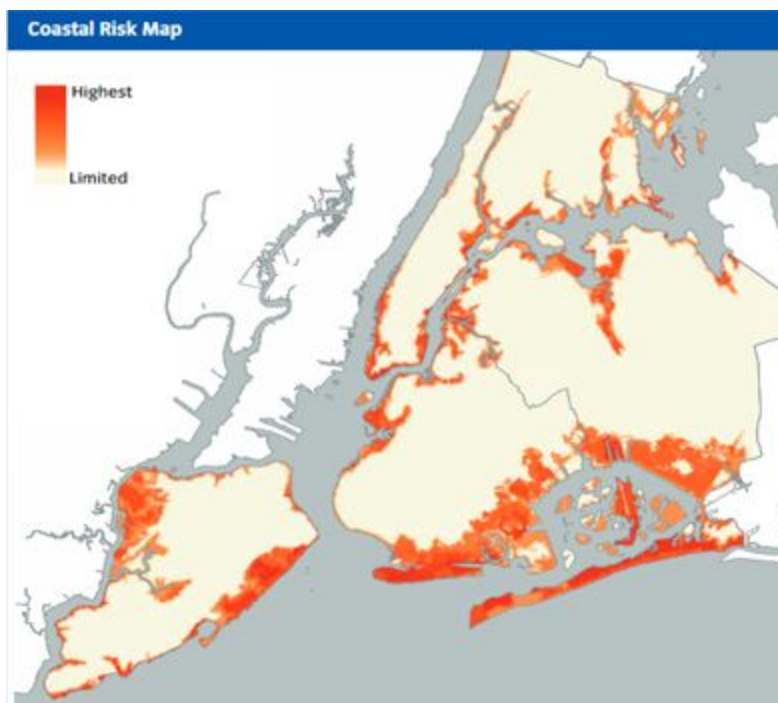
Figure 1: New York City Coastal Risk Map (NYC Mayor's Office of Long-Term Planning and Sustainability, 2015)

There exist several different pathways to reach greater degree of resilience. This paper seeks to elaborate on the relationship between two established pathways for resilience, via built

environment and via community. First, these concepts will be developed through an intensive literature review. Plans established by the New York State Governor's Office of Storm Recovery (GOSR) and the Mayor's Office for three neighborhoods in New York (Lower Manhattan; Red Hook, Brooklyn; and Breezy Point, Queens) will be categorized based on if they pursued a pathway of resilience through built environment or community. The state-led frameworks for each neighborhood will then be analyzed based on their proposed balance of these two perspectives against the context of neighborhood community capital, development utility, and views on resilience.

1.1 Literature Review

Urban Resilience

Resilience as a term has risen in popularity in urban development context over the last several decades because it functions as a commonly agreed upon value, in part because it lacks a commonly agreed upon definition. For the purpose of this paper, the definition developed by Meerow, S., Newell, J. P., & Stults, M. in their 2016 paper will be used:

> *Urban resilience refers to the ability of an urban system-and all its constituent socio-ecological and socio-technical networks across temporal and spatial scales to maintain or rapidly return to desired functions in the face of a disturbance, to adapt to change, and to quickly transform systems that limit current or future adaptive capacity.* (Meerow et al., 2016, p. 45).

This definition acknowledges several tensions in academia surrounding how to plan for resilience, especially concerning pathway to resilience and whether resilient systems should be focused on a goal of persistence, transition, or transformation. (Meerow et al. 2016). This definition can be applied to both "general resilience," meaning the ability of the entire system to sustain itself during any shock, and "specified resilience," which refers to only a specific shock or a specific part of a system (Chelleri, L., Waters, J. J., Olazabal, M., & Minucci, G., 2015) .

Built Environment Resilience

The Built Environment is a concept that arose in the 1970s to describe the system of human-constructed aspects of our surroundings which can encompass different physical, natural, economic, social, and cultural capital. This can take the form of buildings, roads, parks, sewers, etc and is often described in contrast to the unbuilt environment. However, aspects of the unbuilt environment are left intentionally intact to serve the needs of urbanization (e.g. barrier islands), and therefore can be included in the natural capital component of the built

environment (Hassler & Kohler, 2014). Built environment solutions work alongside the notion of resilience engineering which is defined as

the intrinsic ability of a system to adjust its functioning prior to, during, or following changes and disturbances, so that it can sustain required operations under both expected and unexpected conditions.

(Hollnagel et al., 2011)

This ability to maintain the function of the built environment system can take multiple forms- resistance, redundancy, and shielding. Resistant built environment components are able to maintain function while encountering a shock. Examples of these are underground, submersible electric lines or elevated houses. Redundant components allow for aspects of a system to fail without hurting the entire system. Examples of of this can be backup generators or ferry transit systems that operate during flooding. Shielding built environment components are installed to prevent the shock from reaching the rest of the built environment or reducing its magnitude. An example of this could be seawall which can block an incoming wave up to a certain threshold. All of these components of built environment infrastructure contribute to the overall resilience of the system.

Community Resilience

Traditionally infrastructure has dominated discussions of urban resilience as the way to enhance cities' ability to withstand shock. The concept of community resilience, however, has gained a lot traction among policy makers due to both its vagueness and its apparent universal appeal. Community, like resilience, is a word that has its power from existing as a "warmly persuasive word" that can be interpreted positively but in different forms for different listeners.

Communities exist at multiple scales can be place-based, network-based, and imagined. Different scales or resilience do not necessarily have positive linear relationships- strong regional community resilience does not guarantee strong local resilience in the same way that a community composed of members with strong individual resilience does not equal strong community resilience.   People exist within many communities simultaneously and the feeling of community can be influenced by outside forces (e.g. the coalescence of a NYC community in response to 9/11). It is important to note that communities are viewed as product of union but can be generally equally be defined by the politics of exclusion (Mulligan, M., Steele, W., Rickards, L., & Fünfgeld, H., 2016; Chelleri et al, 2015).

The questions then arise how do we measure the resilience of a community and how can community resilience contribute to the overall resilience of an urban system. Daniel Aldrich

and Michelle Meyer assert the answer is social capital, which they cite as "the aggregate of the actual; or potential resources that are linked to the possession of more or less institutionalized relationships of mutual acquaintance or recognition," (Aldrich & Meyer, 2014, 3) is the primary determinant of a community's resilience. This type of social capital refers to the entire community as opposed to an individual's social capital and takes three primary forms: bonding, bridging, and linking. Bonding social capital is refers to tight-knit personal connections, generally between people of similar demographics and resources. Bridging social capital refers to connections among acquaintances and are more likely to connect people of different demography and resources. Linking social power is the connections between people and decision-makers. All three forms contribute the community resilience and a successful strategy will work to develop or institutionalize all three types of social capital. (Aldrich & Meyer, 2014; Mulligan et al, 2016).

When experiencing a crisis, humans tend to rely on simplified decision techniques, or heuristics (Brudermann et al, 2013). In communities with strong social capital and established networks, this groupthink can occur in a more structured way. People are able to direct attention to those with greater relevant capacities and resources because of access and community knowledge. This means that by increasing resources and capacity within a neighborhood, the usefulness of social bonds is increased.

Drawing on the concept of community social capital, community resilience for the purpose of this paper is linked to the ability of a group of individuals, united by location, interest, of imagination, to withstand a shock, adapt to a change, or transform a system through use of their bonding, bridging, or linking social capital.

1.2 Research Aims

Extensive literature has examined the theoretical frameworks and applications of these two pathways to resilience- community and built environment. In practice though, neither approach should be pursued in isolation. If a hazard is so strong that it wipes kills an entire community instantly, then the strength of their community capital does nothing to ensure the perverence of urban systems within the community. An example would be the village of Petobo, Indonesia which had its entire population and infrastructure wiped off the map by a tsunami in 2018 (Abdurachman, Dean, & Paddock, 2018). Conversely, no built environment intervention can mitigate the risk of all known and unknown hazards, and when things do occur, the community's ability to maintain the function of their urban systems is highly dependent on their ability to work together. This was evidenced during Hurricane Katrina in New Orleans where

after the levee system failed, Vietnamese immigrant communities experienced considerably faster recovery than similar neighborhoods due to their strong bonds within their community and to the greater diaspora (Aldrich & Meyer, 2014; Mulligan et al, 2016).

Resilience frameworks need to tailor the balance of these approaches for the context of risks and vulnerabilities within a certain community. Unfortunately, urban plans and policies are not perfectly fitted to their aims and are deeply influenced by political and practical factors. Little attention has been paid to how decision makers have balanced their resilience frameworks between these two pathways. By better understanding how neighborhood factors impact government approaches, communities are emboldened with a new lens with which to critically analyze state-led resilience strategies. This paper explores what factors have led New York city and state governments to pursue different balances for three neighborhoods with similar continued flood risk, but vastly different development and community aspects.

2.0 Case Study

This thesis analyzes the way that New York State and City government have balanced resilience plans between strengthening the built environment and strengthening community. Three neighborhoods were selected for analysis in this paper: Lower Manhattan; Red Hook, Brooklyn; and Breezy Point, Queens. All three neighborhoods represent high-risk neighborhoods that had negative impacts during Superstorm Sandy and have been given notable priority in resilience planning by city and state agencies. At the same time, they were selected because they provide significant variation in the combination of pre-established sense of community and developmental interest for the city as a whole.

Figure 2: Map of Case Study Neighborhoods

2.1 Lower Manhattan

Lower Manhattan refers to the geographic area on the southern tip of Manhattan. For purpose of this report, Lower Manhattan comprises the sub-neighborhoods Two Bridges, the Seaport, the Financial District, the Battery, Battery Park City, and Tribeca. This is how it was defined in the March 2019 Lower Manhattan Resilience Study by the New York City Economic Development Council (NYCEDC) because of a shared coastal vulnerability. During Superstorm Sandy, the area experienced widespread flooding and disruptions of critical services such as power and drainage. Due to combined sewer overflow, 5.2 billion gallons of water were unintentionally released from the combined sewer into the waterways. Flood damage to 400 buildings, had a significant impact on the commercial aspect of the neighborhood, especially for small businesses and residential life, damaging 21,000 homes. (NYCEDC, 2019; NY Rising, 2014b)

Figure 3: Map of Lower Manhattan (NYCEDC, 2019)

2.2 Red Hook, Brooklyn

A former industrial and shipping neighborhood, Red Hook is situated on a peninsula that juts into Upper New York Bay. The neighborhood historically has been disconnected by from the rest of Brooklyn due to construction of the Brooklyn-Queens Expressway by Robert Moses in 1959. This has translated into a culture of self-organization, which is relied on during Superstorm Sandy. The majority of the neighborhood was overwhelmed by storm surge, with most of the main commercial corridors along Van Brunt Street and Lorraine Street submerged by 6 to 12 feet of floodwater. The only community health center was closed for a week following the storm and most of the neighborhood went weeks without working connection to electricity or gas. There was significant damages to the base floor of buildings, leading to temporary relocations of residents and temporary closure of manufacturing plants. (NY Rising, 2014c)

Figure 4: Map of Red Hook (NY Rising, 2014b)

2.3 Breezy Point, Queens

Breezy Point is a coastal community on the western tip of the Rockaway Peninsula in Queens. The land has been owned and maintained by the Breezy Point Cooperative since the 1960s. The fairly isolated neighborhood has been largely populated by Irish-Americans but is gradually becoming more diverse. It is much less urbanized than New York City as a whole and consists largely of individual residences and scattered commercial activity. Due to its beach location, the population more than doubles during summer months. During Superstorm Sandy, Breezy Point experienced large-scale erosion of their protective dunes and high-velocity wave inundation from Jamaica Bay and the Atlantic Ocean. The flooding damaged most homes, submerged critical transportation routes, and inhibited local first responders.   Rising seawater damaged the electrical grid leading to a large-scale fire. Due to flooding, first responders could not reach the neighborhood and 355 homes burnt down. (Sciolino, 1984; NY Rising, 2014a)

Figure 5: Map of Breezy Point (NY Rising, 2014a)

3.0 Methods

  To analyze the factors that influence the balance of Built Environment and Community resilience strategies, two methods were employed: a desk review of documents and a survey. In the first phase a case study design was performed between three neighborhoods selected based on their damage from Superstorm Sandy, continued flood risk, and large public investment in resilience plans. This case study analysis used information mined from journal publications, news through media, census data, and government reports. Each case study operated in two sections- generation of a community profile and analysis of risk and resilience measures from the state level (detailed below in the subsections). In the second phase, the results from the case study analysis were triangulated with findings from a questionnaire, observation, and informal conversations in the field. The extensive fieldwork that constitutes part of the second phase took place between March and April 2019

3.1 Principles and Measurements for Community Profile and Resilience Plan Analysis

The Case Study Analysis is divided into two parts: Neighborhood Community Profile and Resilience Plans. The New York State measures analyzed are those released by 2014 New York Rising Community Reconstruction (NYRCR) committees. Each of the neighborhoods was provided $3 Million by the GOSR to generate a set of proposals.   Large Built Environment proposals often take several years to develop due to their cost and profile. The resilience mega-projects for Breezy Point and Lower Manhattan were not proposed until much later. Therefore to more accurately portray the relative balance, the large-scale infrastructure projects from the OneNYC, produced by the Mayor's Office, and Mayor De Blasio's resilience proposal in March 2019 issue of New York Magazine area also included. This paper is designed only to address the risk of flooding, rising tides, and hurricanes and only these plans will be analyzed.

The Community Profile used census data, academic journals, and news articles. The goal of this section is to establish a cross-comparison of how each of the three neighborhoods rank in terms of sense of community and relevance to NYC development goals. Strength of community was analyzed through census data on population shifts between 2000 and 2010 and geospatial clustering by race. Assessment of community strength is a complex task, and these indicators were chosen because of they can be determined by publicly accessible data. They present a circumstantial, quantitative assessment of community strength that can then be triangulated by the more qualitative assessment via survey.

Relevance of Development Goals was determined by economic activity in terms of jobs, government functions, transportation connectivity, touristic importance, and public/private investment in non-resilience urban projects. This indicators were chosen because they provide a diversified portrait of factors that influence the desire for city government to invest in a neighborhood for development purposes. Development utility refers not only to perceived potential but also the current function to city operations and growth.

For Resilience Measures, NYRCR proposals were reviewed categorized based on their intent to strengthen community or built environment. Measures were classified as community measures if their primary intent was to increase sense of community, community social capital, or community capacity. Measures were classified as built environment if they relied on improvements in the built environment to block or absorb disasters, create a redundancy, or increase robustness of infrastructure. These measures were analyzed based on the diversity, scale, and funding. Due to the large difference in population between the three neighborhoods, project costs were displayed both in total cost and cost per resident for comparison.

3.2 Survey

In total, 131 surveys were generated and distributed and within the respective communities. The questions on the survey were separated into four sections: Personal Demographics, Neighborhood Community, NYC Community, and Resilience. Neighborhood community questions were crafted to determine how the participant's bonding, bridging, and linking social capital. NYC community questions were designed to see if the respondent reported stronger bonding or bridging social capital for New York City but as a whole than their specific neighborhood. The resilience questions determined community views on resilience planning. The goal was to determine how these factors influence distribution of planning emphasis between community and built environment solutions. All questions were multiple choice with a few questions allowing respondents to write in an answer if they selected "other." A copy of the questionnaire can be found in Annex 1.

Many of the questions asked respondents to discuss the extent to which they agreed with different statements and allowed them to respond with Strongly Agree, Agree, Somewhat Agree, Somewhat Disagree, Disagree, Strongly Disagree. For analysis purposes, these responses were quantified. "Strongly Agree" corresponds to a value of 6, "Agree" to a value of "5," and so on with "Strongly Disagree" corresponding to a "1." Many of the questions did not yield significant differences between the neighborhoods. This paper will focus on areas where there are notable differences.

Questionnaires were distributed at several different pedestrian traffic areas within Lower Manhattan and Red Hook. A detailed representation of survey locations and dates is illustrated in Figures 6 and 7. For Breezy Point, the survey was distributed by email through Breezy Point Cooperative.   Survey respondents were offered the opportunity to submit their name for a raffle to earn a $20 gift card. However, most declined. In total there were 39 respondents from Lower Manhattan, 48 respondents from Red Hook, and 44 respondents from Breezy Point.

Figure 6 - Map of Approximate Survey Locations - Lower Manhattan

(Basemap: (NYCEDC, 2019))
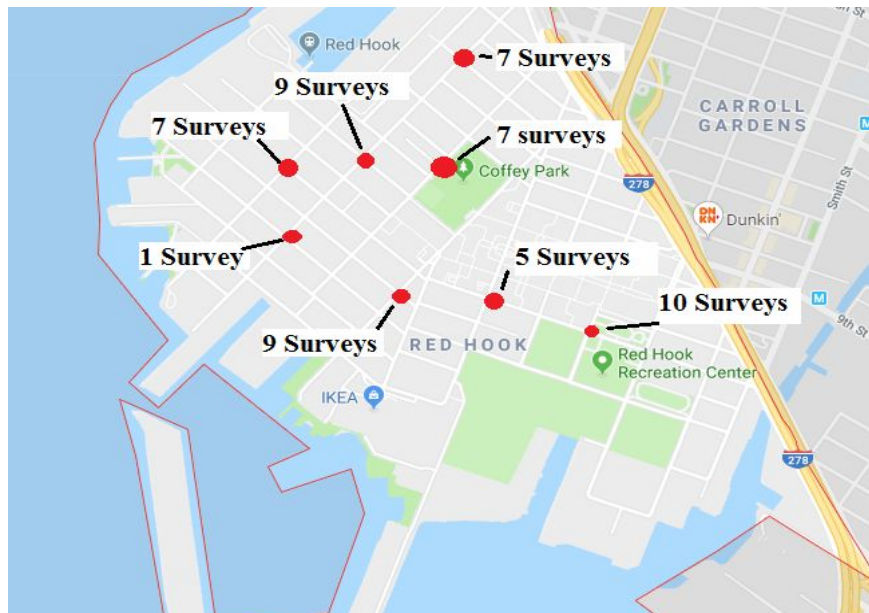
Figure 7 - Map of Approximate Survey Locations - Red Hook

(Base Map: Google)

3.3 Limitations

This paper seeks only to examine the proposed plans at two points of time: The release of the 2014 NY Rising findings and the major proposals of the City Government as of March 2019 as documented in OneNYC Progress Report, NYCEDC studies, and De Blasio's proposal in New York Magazine.

Although the documents analyzed for this project do allocate costs to each project they propose, actual funding streams for each project are a complex weave of Federal, State, and City government and government agency resources. Proposals are also designed partially based on how they can access different funding sources, such as the Community Block Grant Program. This paper is looking just at the proposed cost and not considering the differences in funding sources.

Lower Manhattan and Red Hook both have a sizable amount of public housing operated by the New York City Housing Authority (NYCHA), but Breezy Point does not. Therefore, vital resilience efforts to bolster the preparedness within NYCHA housing are not within the scope of this paper. Further studies should be conducted to analyze how the presence of NYCHA housing influence resilience design.

The survey data collected is only intended to triangulate the findings from the desk review and is not representative of the entire neighborhood. Further studies should include a more extensive survey process. Findings from this paper only pertain to the analyzed neighborhoods and are not intended to be extrapolated for different contexts.

4.0 Results

4.1 Case Study Analysis

4.1.1 Lower Manhattan

4.1.1.1 Neighborhood Profile

a) Demography and Sense of Community

Demographic data for Lower Manhattan is summarized below in Table 1.

Lower Manhattan		
	2000 Census	2010 Census
Population	34,418	60,976
Median Income (USD)	134,985	146,176
Racial Composition		
White (%)	66.9	66.9
Black (%)	6.8	4.3
Asian (%)	14.1	17.4
Other (%)	4.1	3.4
Hispanic/Latino of any race (%)	8.1	8

Table 1: Demographic Data - Lower Manhattan

(NYC Planning Population FactFinder [NYC PFF], n.d.)

     The data above shows that the population of Lower experienced extremely rapid growth in the last twenty years, with an increase of 77.2% between 2000 and 2010. This type of growth implies that a large portion of the population has been recently transplanted and has no personal or historical ties to the neighborhood.
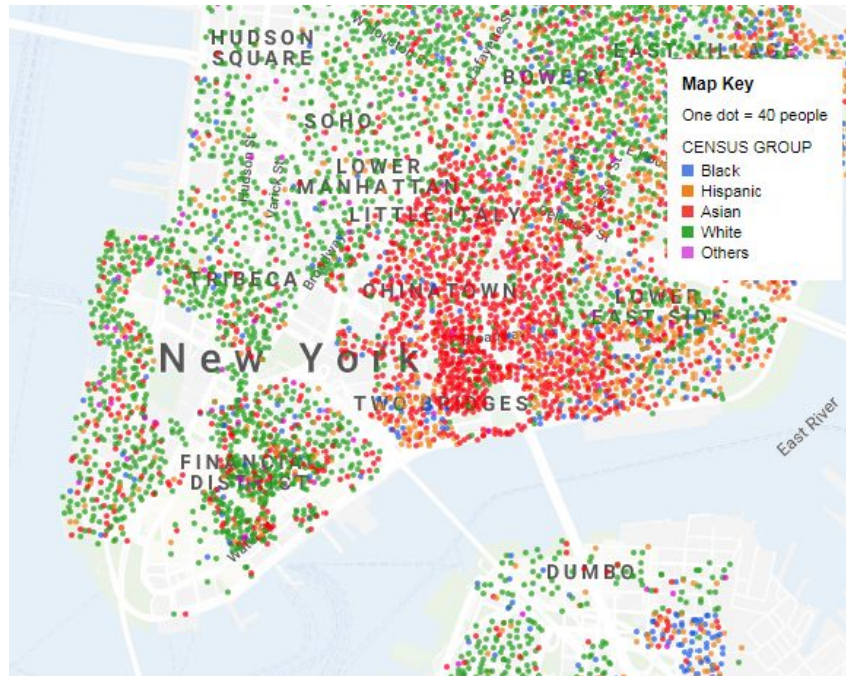
Figure 8: Population Distribution by Race - Lower Manhattan

(Bloch, Cox, & Giratikanon, 2015)

The figure above illustrates that Lower Manhattan is heterogeneous and an extremely dense neighborhood. The racial clustering reveals that there is a large pocket of predominantly Asian residents around Historic Chinatown in Two Bridges, implying discontinuity in community. The extremely high density throughout the neighborhood implies a lower sense of community due to lower likelihood of familiar run-ins for a given resident. Furthermore, high volumes of tourists and commuters from other parts of city and region dilute the percentage of residents. Tall buildings, high traffic sidewalks, and large outsider presence translate into reduced interactions between residents. Sense of community in Lower Manhattan is classified as weak.

b) Development Utility

Economic Activity: Lower Manhattan, which encapasses only 1% of the total landmass of New York City is a major economic hub for the city. The neighborhood generates about 10% of New York's Gross City Product and hosts 10% of New York City's jobs, amounting to approximately 400,000 jobs. The neighborhood is of extreme economic significance to the city and region. (NYCEDC, 2019; NYC Department of City Planning [NYCDCP], 2018)

Government Functions: Lower Manhattan hosts a large concentrations of city, state, and federal government spaces: New York City Hall, New York County Courthouse, the heads of most city government agencies, the Jacob k. Javits Federal building, numerous small park spaces, and the office for the Port Authority of New York and New Jersey. (NYCEDC, 2019)

Touristic Importance: This area is also of huge touristic interest, hosting some of the city's most frequently visited attractions including the Staten Island Ferry, the Oculus, One World Trade, the 9/11 memorial, the Brooklyn Bridge, Brookfield Center, and the charging bull. In 2016 the neighborhood had 15 million tourists visit. (NYCEDC, 2019)

Transportation Connectivity: Lower Manhattan is one of the most connected parts of New York City. Nine bus lines, six ferry lines, and thirteen subway lines stop through the neighborhood. It contains some of the busiest subway stations including Fulton Street which had the fifth highest ridership of any New York City station in 2017. The bike share program, CitiBike, does operate in Lower Manhattan. (NYCEDC, 2019, NY Rising, 2018; New York City Bus Maps, n.d.)

Public/Private Investment: After the terrorist attacks of September 11, 2001, there was a strong push from city officials to encourage investments in the area. Private actors such as the Lower Manhattan Development Corporation and the Tribeca Film Festival sprung up about at this time for the same reason. Due to these public and private efforts, many offices have returned their operations to the neighborhood and the residential sector has boomed with an entire array of new buildings, including the on-going multi-billion dollar World Trade Center development plan .(NYCEDC, 2019, NY Rising, 2018)

Lower Manhattan has a significant concentration of political, economic, and transportation influence to the city as a whole. For these reasons, the state of Lower Manhattan has a greater impact on the ability of other parts of the city to function properly, and Lower Manhattan has an extremely high development utility for the city based primarily on its current use rather than its potential.

4.1.1.2 Resilience Plans

The 2014 NYRCR Plan contained four strategies intended to strengthen neighborhood resiliency through investments in community networks and social capital. Lower Manhattan was defined as anything below 14th Street in the project. Therefore,

only projects that fell within the area defined as Lower Manhattan in this paper are included.

Local community emergency preparedness program is a project that was proposed to establish a neighborhood entity that would coordinate emergency services between city, state, national, and private actors and disseminate information within the community. There would be an coordinator and staff appointed to generate emergency response plans. The goal of this program would be to improve coordination of existing efforts, build local capacity, and increase linking social capital through creation of a responsible organization.

Community resource/ recovery center and community-based organization (CBO) grant program represent a two tier project to establish a network of community resource centers within the operating space of existing CBOs to disseminate logistics, communications, and supplies to the community. The centers would receive initial funding from the state, including for emergency backup generators. These spaces would serve as entry points into communities for the NYC Office of Emergency Management and have different focuses depending on the host CBO. The grant program would help participating CBOs make physical improvements and expand their staff capacity. The goal of this program would be to improve community knowledge and bolster linking and bridging social capital.

Residential resiliency and education program is a program that provides education, technical information, counseling, and financial assistance to individuals to improve the resilience of their homes.   Although this program does assist in built environment improvements, the main focus is to enhance capacity and knowledge of the community.

Small business resiliency and education program is a program that provides the same services as the previous one, except aimed at small businesses. Increasing the resilience of small businesses is crucial to maintain the economy, access to services, and public space activation.

These programs are summarized in Table 2.

Lower Manhattan		
Community Approach Measure	Cost (USD)	Cost (USD per resident)
Local community emergency preparedness coordinators	2,000,000	33
Community resource/ recovery center and CBO grant program	12,000,000	197
Residential resiliency and education program	7,000,000	115
Small business resiliency and education program	3,750,000	61
Total Investment in Community Approach	24,750,000	406

Table 2: Community Approach Resilience Measures - Lower Manhattan

(NY Rising, 2014b)

The 2014 NYRCR had three projects proposed to enhance the resilience of Lower Manhattan through investments in the Built Environment.

Stormwater capture and retention study is a program to develop and test stronger means of stormwater management, such as pocket parks, bioswales, and community garden networks, within Lower Manhattan.

Berming and deployable walls at Battery Park is a system of berms and flood barriers at Battery Park with investments for the design of further anti-flooding measures outside of the floodplain.

Targeted flood protection strategy for lower West Street includes the study, design, and implementation of anti-flooding measures along West Street in Battery Park City. (NY Rising, 2014b)

The NYRCR plan was created with the assumption that larger scale resilience plans would be developed in the future. Therefore the following Built Environment plans are also included:

Lower Manhattan Resilience Project (Design) - Two Bridges is a series of deployable and passive interventions to defend 0.80 miles of waterfront against 100 year storm surge and sea level rise, respectively. This is the only coastal project in the neighborhood that has completed its design phase. *(N*YC Mayor's

Office of Sustainability, 2018) Other proposed coastal projects in the report are not included in this analysis because they are incorporated into the larger-scale Lower Manhattan Climate-Proof Project.

Lower Manhattan Climate-Proof Project - In March 2019, Mayor De Blasio proposed an expansive project to "climate-proof" Lower Manhattan with a 500-foot raised coastal extension around the Financial District and South Street Seaport. (De Blasio, 2019)

The programs are organized in Table 3 below.

Lower Manhattan		
Built Environment Approach Measure	Cost (USD)	Cost (USD per resident)
Stormwater capture and retention study	2,000,000	33
Berming and deployable walls at Battery Park Phase I	2,000,000	33
Berming and deployable walls at Battery Park Future Phases	5,400,000	89
Targeted flood protection strategy for lower West Street Design	750,000	12
Targeted flood protection strategy for lower West Street Funding	8,400,000	138
Lower Manhattan Coastal Resiliency: Two Bridges (Design)	203,000,000	3,329
Lower Manhattan Climate Proofing Plan	10,000,000,000	163,999
Total Proposed Invent in Built Environment Approach	10,217,550,000	167,567

Table 3: Built Environment Approach Resilience Measures - Lower Manhattan
(NY Rising, 2014b; NYC Mayor's Office of Sustainability, 2018; De Blasio, 2019)

A ratio of Built Environment Solution to Community Solutions is provided below in Table 4

Cost Ratio of Built Environment to Community Approach	412.8

Table 4: Cost Ratio of Built Environment to Community Approach - Lower Manhattan

4.1.2 Red Hook, Brooklyn

    4.1.2.1 Neighborhood Profile

        a) Demography and Sense of Community

Demographic data for Red Hook, summarized below in Table 5, shows that the population has remained relatively constant for the last two census cycles, but with a notable demographic shift. The percentage of white residents increased while black/hispanic residents decreased. This fits with a trend of gentrifying neighborhoods in South Brooklyn and signals at potential tensions in the community.

Red Hook		
	2000 Census	2010 Census
Population	10,215	10,228
Median Income (USD)	25,440	24,559
Racial Composition		
White (%)	7.5	17
Black (%)	42.5	36.2
Asian (%)	0.5	2
Other (%)	2.8	2.1
Hispanic/Latino of any race (%)	46.7	42.7

Table 5: Demographic Data - Red Hook (NYC PFF, n.d.)
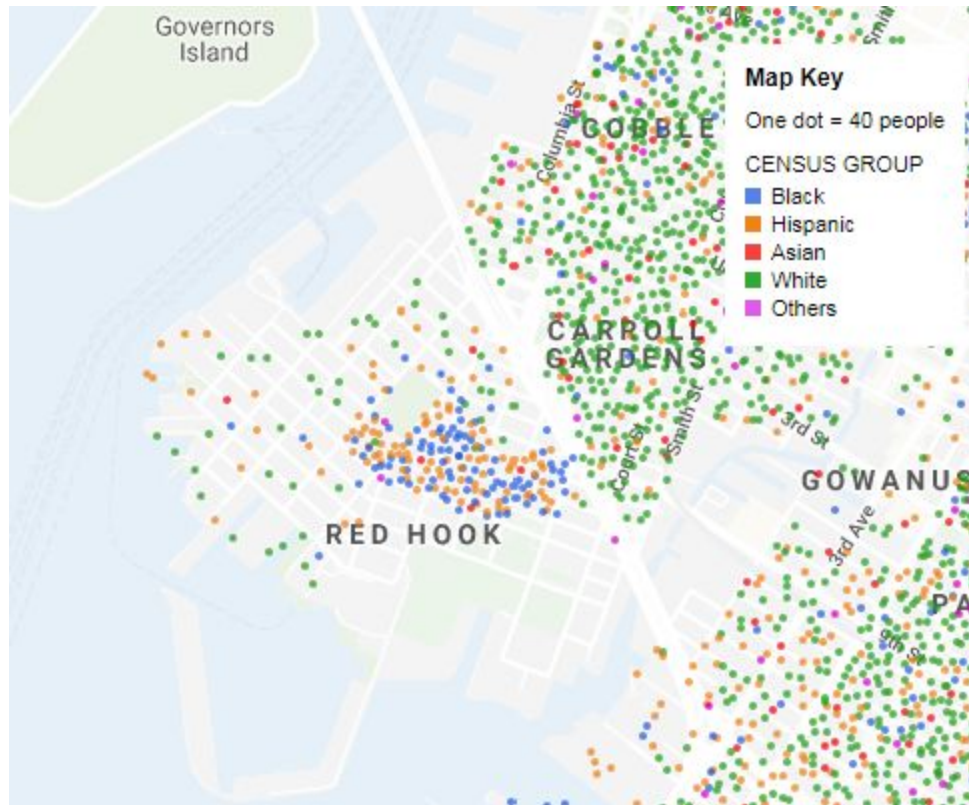
Figure 9: Population Distribution by Race - Red Hook (Bloch et al, 2015)

Figure 9 provides a visual breakdown of the neighborhood divide. There is a sparse contingent of mostly white and hispanic residents along water, including the commercial corridor along Van Brunt street near the northwest waterfront. There is also a dense cluster of black and hispanic residents in and around Red Hook Houses, Brooklyn's largest public housing project. This establishes a likelihood of a rift between two smaller communities within Red Hook.

Overall, Red Hook's population shifts are not a severe as Lower Manhattan but the shift and geospatial layout of racial data imply a neighborhood in tension. Tension in gentrification contexts can result in strong connections within the two bubble communities.

b) Development Utility

Economic Activity: Red Hook contains one of New York City's 16 Industrial Business Zones, where benefits tax incentives are provided for industrial, manufacturing, and maritime sectors. There are about 6,000 jobs located in Red Hook as of 2012 with almost 60% in concentrated in these sectors. About 67% of businesses operating in Red Hook qualify as micro-businesses meaning they are comprised of five or fewer employees.   (NY Rising, 2014c; NYCDCP, 2014)

Government Functions: Red Hook has typical neighborhood government services including public schools, two fire departments, a library, public housing, parks, and public ballfields. The Port Authority of New York and New Jersey operates two maritime ports along the Red Hook waterfront: the Red Hook Container Terminal and Brooklyn Cruise Terminal. (NY Rising, 2014c)

Transportation Connectivity: The neighborhood has two bus lines that connect through it. The two closest subway stations, Carroll Street and Smith Street, fall outside of the Red Hook and into neighboring Carroll Gardens and Gowanus, respectively. The bike share program, CitiBike, does operate in Red Hook.   Since 2017, Red Hook is a stop on the South Brooklyn Ferry Line, a result of implementation of the 2014 NY Community Rising Community Reconstruction Plan. (NY Rising, 2014c; New York City Bus Maps, n.d.)

Touristic Importance: Due to its relatively poor connectivity via subway to other tourist areas such as Midtown and Lower Manhattan, DUMBO, and Williamsburg, it does not draw in high volume or tourists. It's main touristic function is hosting Brooklyn Cruise Terminal. However both the terminal and cruise companies suggest that their customers arrive by car or ride-share service due to the relative isolation of the area. (NY Rising, 2014c)

Public/Private Investment: South Brooklyn in general is a region is considerable flux from shifting demographics and large investments. Red Hook is surrounded by Sunset Park to the south which hosts the recently renovated Industry City complex and a recently rezoned Gowanus and gentrified Carroll Gardens to the east (DeGregorio, 2019; Kensinger, 2018). This strategic location and high area of waterfront and former industrial property make it a desirable location for public and private investment and several large-scale projects are proposed in the area. These include a public-private waterfront development between New York State and Aecom to redevelop the waterfront with 45,000 new apartments and an extension of the subway "1" line; fostering better connections with the city by making Red Hook the end destination of the Brooklyn-Queens Connector, a 16 mile proposed streetcar route that connects up to Astoria, Queens; a joint venture between NYCEDC and the Norwegian company Equinar using an existing maritime to create the "Sustainable South Brooklyn Marine Terminal" to act as the onshore operating facility for New York State's plans to build a large arsenal of

offshore wind turbines in New York Bay. (Bagli, 2018; Rubinstein, 2015; Grymbaum, 2016; NYCEDC, 2018)

Red Hook is a strategically located former industrial, gentrifying neighborhood with significant maritime functions and public housing. The development utility is moderate-to-high due mostly to its perceived development potential as opposed to current use.

4.1.2.2 Resilience Plans

The 2014 NYRCR Plan for Red Hook contained three strategies intended to strengthen neighborhood resiliency through investments in community networks and social capital.

The *Relief Center Network* would work the same way as the equivalent program in Lower Manhattan by investing in CBOs to create a network of relief centers.

Resiliency Construction Workforce Training is a program aimed at local residents, especially low-income, to learn skills connected to the construction of resilient infrastructure. Although this a long term investment in a built environment approach as well, this program is designed to build local capacity and awareness on resiliency.

Local Financial Assistance to Small Businesses, Start-Ups, and Homeowners/Tenants aims to improve the economic resilience of the community. Programs that strengthen the resilience of individual strengthen the usefulness of community bonds for other members of the community.

These programs are summarized in Table 6.

Red Hook		
Community Approach Measure	Cost (USD)	Cost (USD per resident)
Relief center network	1,500,000	146.66
Resiliency construction workforce training	750,000	73.33
Local financial assistance to small businesses, start-ups, and homeowners/ tenants	1,000,000	97.77
Total Investment in Community Approach	3,250,000	317.76

Table 6: Community Approach Resilience Measure - Red Hook (NY Rising, 2014b)

The 2014 NYRCR Plan had four projects proposed to enhance the resilience of Red Hook through investments in the Built Environment.

Emergency backup generator for health and services provider creates a redundancy for a critical system.

A new *Ferry Terminal* that is built to resist flood damage provides a redundancy that reduces pressure on bus and subway services for transportation and provision of emergency services.

Drainage Study funds built environment solutions to reduce stormwater runoff.

Red Hook Integrated Flood Protection is a large scale partnership program between city and state government study, design, and implement a multi layered coastal protection system along the Red Hook peninsula.

Red Hook Integrated Flood Protection still is the major mega project in the OneNYC 2018 progress report and therefore no additional projects were added from outside of the NYCRC report.

The programs are organized in Table 7 below.

Red Hook		
Built Environment Approach Measure	Cost (USD)	Cost (USD per resident)
Emergency backup generator for health and social services provider	350,000	34
Ferry Terminal Phase 1	500,000	49
Ferry Terminal Phase 2	5,000,000	489
Drainage Study	500,000	49
Red Hook integrated flood protection system	200,000,000	19,554
Total Proposed Invent in Built Environment Approach	206,350,000	20,175

Table 7: Built Environment Approach Resilience Measure - Red Hook (NY Rising, 2014c)

A ratio of Built Environment Solution to Community Solutions is provided below in Table 8.

Cost Ratio of Built Environment to Community Approach	63.5

Table 8: Cost Ratio of Built Environment to Community Approach - Red Hook

4.1.3 Breezy Point

4.1.3.1 Neighborhood Profile

a) Demography

Demographic data for Breezy Point is summarized below in Table 9. The data shows that Breezy Point has a small, highly homogenous, and very stable population, indicating a high likelihood of strong neighborhood bonds.

Breezy Point		
	2000 Census	2010 Census
Population	4,242	4,096
Est. Summer Population	12,000	12,000
Median Income (USD)	92,226	101,854
Racial Composition		
White (%)	98	96.5
Black (%)	0.1	0.1
Asian (%)	0.4	0.6
Other (%)	0.2	0.6
Hispanic/Latino of any race (%)	1.3	2.3

Table 9: Demographic Data - Breezy Point (NYC PFF, n.d.; NY Rising. 2014a)

Figure 10 below shows the geospatial distribution of the neighborhood by race/ethnicity. The data illustrates that the population is not extremely dense and extremely homogeneous, further indicating strong community..
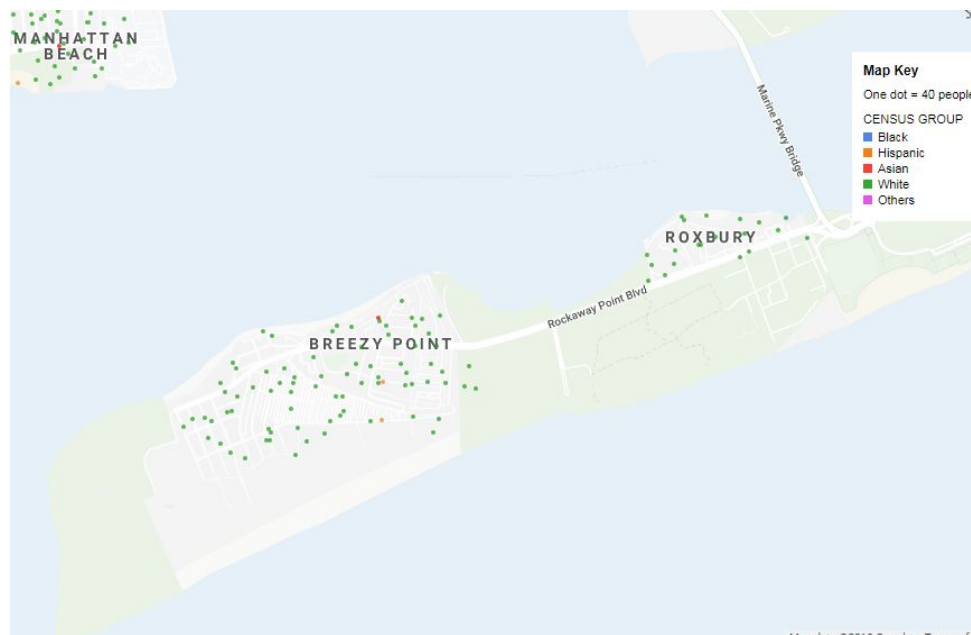

Figure 10 Population Distribution by Race - Breezy Point (Bloch et al, 2015)

Breezy Point represents a tightly-knit homogeneous community, with many families having spanned multiple generations. The neighborhood maintains a high degree of privacy compared to other parts of New York City.

b) Development Utility

Economic Activity: Breezy Point only employs a small number of people locally with about 300 to 400 private sector jobs. There was a 70% increase in jobs from 2013 to 2016, but this was mostly as result of small-scale industries finally recovering from Hurricane Sandy. (Office of the New York State Comptroller, 2018)

Government Functions: Because the Breezy Point Cooperative manages most services such as police force, fire department, and sanitation privately, there is less involvement from the city government than in other neighborhoods. The Breezy Point community is sandwiched between two areas owned and operated by the National Park Services- Breezy Point Tip and the Fort Tilden portion of the Gateway National Recreation area. (NY Rising, 2014a; Sciolino, 1984).

Transportation Connectivity: Breezy Point is not connected to the rest of New York City via public transportation. The closest metro station (Broad Hollow) and bus station (Rockaway Point) are both an hour walk away. Entry to the community is only accessible via Rockaway Boulevard and a formal invitation and parking permit are required for entry via car. (NY Rising, 2014a)

Touristic Importance: Due to its poor connectivity and restrictive entry guidelines that permit entry only to homeowners and their invited guests, there is very little touristic value to the neighborhood. (NY Rising, 2014a; Sciolino, 1984).

Public/Private Investment: Because the land is owned and operated by the Breezy Point Cooperative, it is not open to large public or private investment without the consent of the cooperative. The area surrounding the community are controlled by the National Park Service and contain threatened species that prevent potential development.(NY Rising, 2014a; Sciolino, 1984).

Breezy Point is poorly connected to the rest of the city, has low urbanization, and does not fall along one of the geographic paths of gentrification (such as the L Train gentrification path). Strong community mobility and land ownership by the Breezy Point Cooperative makes it a difficult and undesirable to develop further, with its primary

benefit to other parts of New York City is to function as a barrier island. The development utility for the city as a whole is low.

4.1.3.2 Resilience Plans

The 2014 NYRCR plan for Breezy Point contained two strategies intended to strengthen neighborhood resiliency through investments in community networks and social capital.

Multipurpose community relief center would function as an emergency shelter during storms and a public access space for residents. This fosters knowledge exchange and enhances bonding and bridging social capital.

Summer store relocation would ensure greater resiliency of a local group of small summer businesses. The resiliency of these businesses helps maintain public space activation, economic resiliency, and sense of community.

The programs are summarized below in Table 10.

Breezy Point		
Community Approach Measure	Cost (USD)	Cost (USD per resident)
Multipurpose community relief center	8,200,000	1,933
Summer store relocation	2,000,000	471
Total Proposed Community Approach Investment	10,200,000	2,405

Table 10: Community Approach Resilience Measure - Breezy Point (NY Rising, 2014a)

The 2014 NYRCR plan had six projects proposed to enhance the resilience of Lower Manhattan through investments in the Built Environment.

Enhanced Dune Walkways would create a continuous protective dune to block and absorb wave inundation while still allowing community access to the beach.

Bayside Coastal Protection in Roxbury, Breezy Point, and Rockaway Point is a program of projects designed to maintain coastland against 10-year event storm surges.

Rockaway Boulevard Elevation is a series of interventions to raise and storm-proof the only access road to the rest of the city.

Housing Elevation Study is an investigation into construction strategies to bulk raise residences above the floodplain.

*Dock Repair f*or docks destroyed Sandy that provide access through the neighborhood.

Stormwater Drainage Improvements by a composite system of grey-green infrastructure to resolve puddling at Breezy Point and Rockaway Point. (NYRCR, 2014a)

The NYRCR plan was created with the assumption that larger scale resilience plans would be developed in the future. Therefore the following plan is also included:

The *Breezy Point Double Dune program* is a complex protective scheme of dunes along the northern and southern shoreline of Breezy Point (NYC Mayor's Office of Sustainability, 2018).

Projects and programs are organized in Table 11 below.

Breezy Point		
Built Environment Approach Measure	Cost (USD)	Cost (USD per resident)
Enhanced dune walkways	5,500,000	1,343
Bayside coastal protection in Roxbury	11,300,000	2,759
Bayside coastal protection in Breezy Point & Rockaway Point	19,300,000	4,712
Rockaway Point Boulevard elevation	76,500,000	18,677
Housing elevation study	275,000	67
Repair Docks	3,200,000	781
Stormwater drainage improvements	12,500,000	3,052
Breezy Point Double Dunes (Design)	58,000,000	14,160
Total Proposed Built Environment Investment	186,575,000	45,551

Table 11: Built Environment Approach Resilience Measure - Breezy Point

(NY Rising, 2014a; NYC Mayor's Office of Sustainability, 2018)

A ratio of Built Environment Solution to Community Solutions is provided below in Table 12.

Cost Ratio of Built Environment to Community Approach	18.3

Table 12: Cost Ratio of Built Environment to Community Approach - Breezy Point

4.2 Survey Results

4.2.1 Sense of Community

The results from the desk review suggested a low sense of community for Lower Manhattan due to extremely high density, potential tensions between two sub-communities within a gentrying Red Hook, and a strong sense of community in Breezy Point due to a homogenous, stable population. The survey asked several questions to assess ties within the community to triangulate the desk review findings. Select results are displayed below.
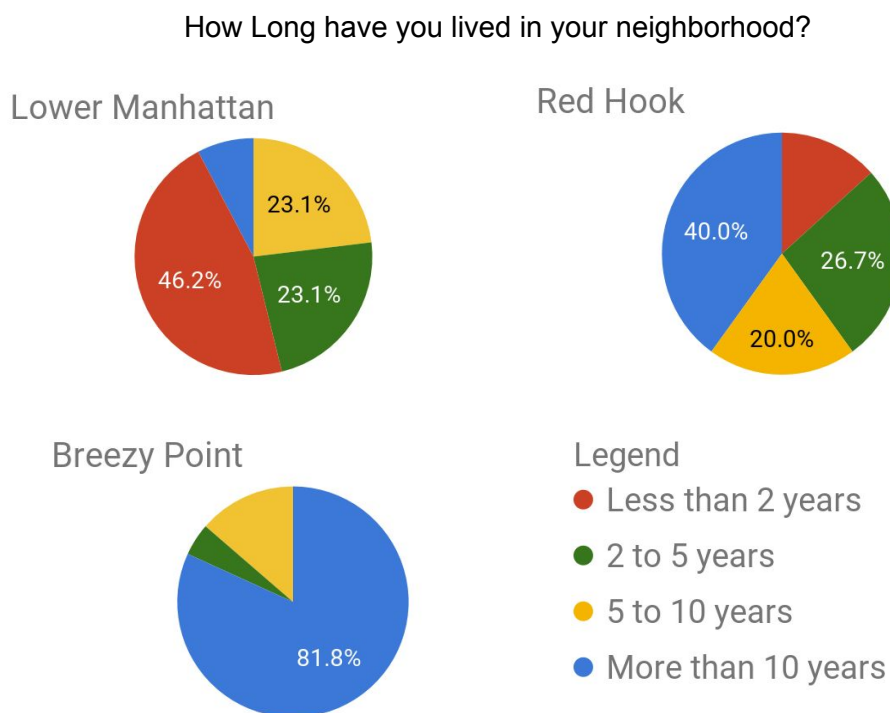
_____

How Long have you lived in your neighborhood?

Figure 11: Time Lived in Neighborhood Responses, by Neighborhood

_____

Responses to Sense of Community and Bonding Social Capital

I have a strong sense of community within my neighborhood.		3.7 / 4.9 / 5.7
I have stronger ties with my communities outside of my neighborhood than with my neighborhood community.		3.8 / 3.7 / 2.6
I have many close friends in my neighborhood.		3.5 / 4.6 / 5.4
If there were an evacuation of the neighborhood, someone from my neighborhood would reach out to make sure I had evacuated.		3.3 / 5 / 5.4

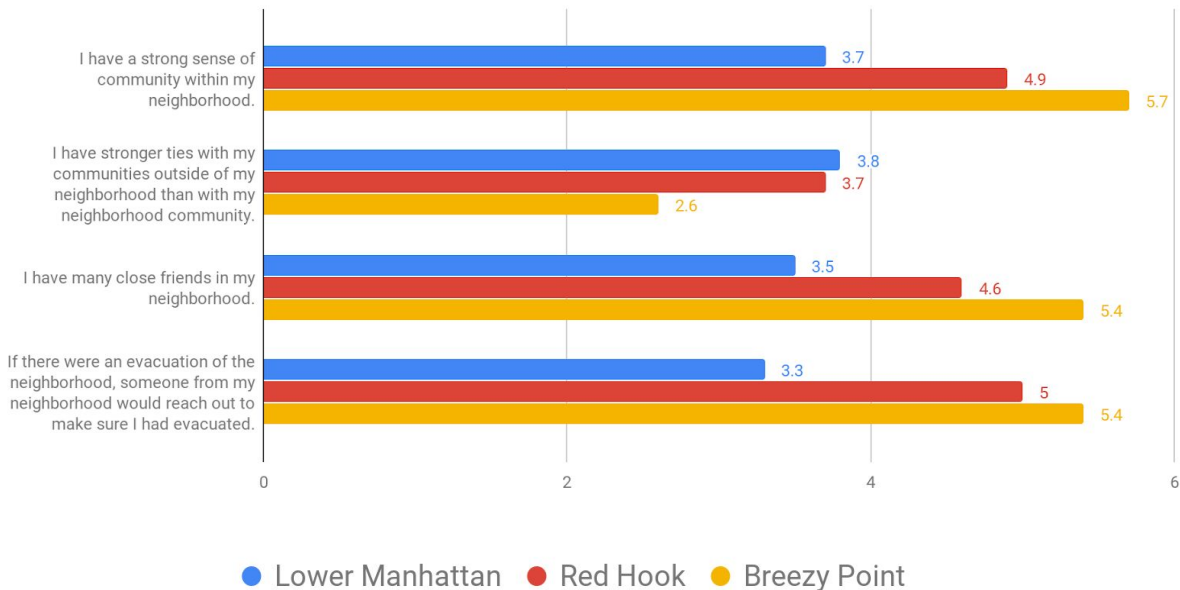● Lower Manhattan ● Red Hook ● Breezy Point

Figure 12: Sense of Community and Bonding Social Capital Responses, by Neighborhood

Among the respondents for this survey, residents from Lower Manhattan have lived the least amount of time in their respective neighborhood, with half of the respondents only moving in the last two years. They were also the least likely to agree with the statement that they have a strong sense of community, have many community friends, or trust someone to check on them if there were an evacuation. Conversations with Lower Manhattan respondents furthered this with most people stating that they did not know their neighbors or have had negative interactions with them. Respondents from Breezy Point and Red Hook, however, have lived longer in their neighborhoods and self-reported a stronger sense of community. Both respondents from Red Hook and Breezy Point spoke about how the relative isolation of their neighborhoods has contributed to their feelings of neighborhood. In conversation, respondents typically cited "community" as the major driver to remain in their neighborhood. Multiple respondents in Lower Manhattan expressed that they did not like neighborhood and even those who had positive or neutral feelings cited "convenience" as the main reason they stayed there.

Responses for Bridging Social Capital
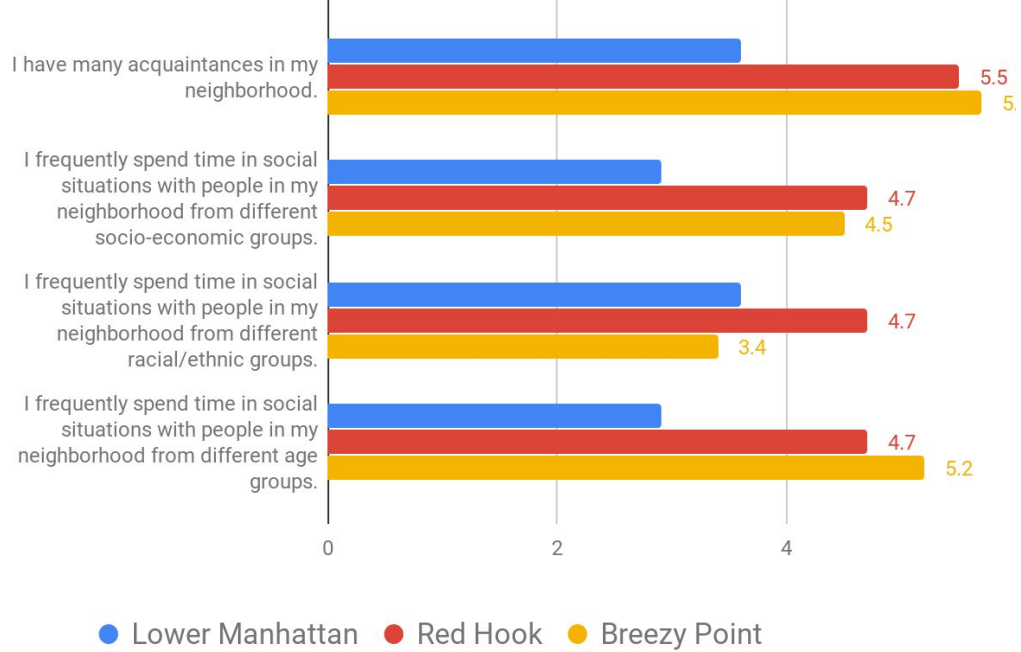
Figure 13: Questions on Bridging Social Capital Responses, by Neighborhood

Respondents from Lower Manhattan generally reported having the lowest bridging capital despite the fact that the neighborhood is quite heterogeneous. Respondents also commented on the lack of "friendly faces" in the public sphere, with many people only entering the neighborhood for work and leaving immediately afterwards. Respondents from Breezy Point reported low neighborhood interaction with people from other races/ethnicities, but more interaction with people from different socio-economic and age groups.
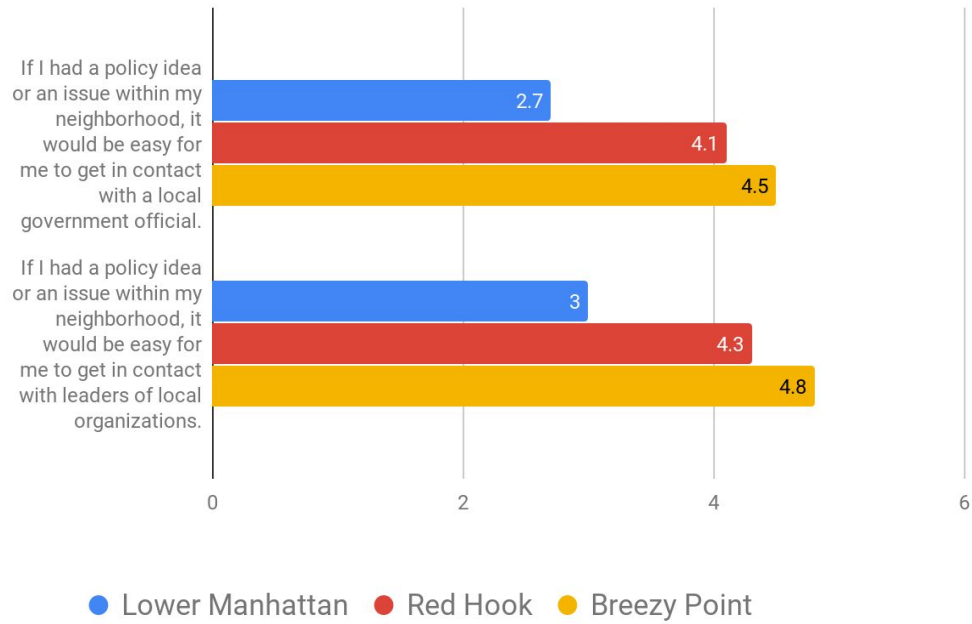
Figure 14: Linking Social Capital Responses, by Neighborhood

Respondents from Breezy Point reported the strongest linking social capital and felt that had the most access to public officials and local leaders. Lower Manhattan reported the weakest linking social capital. The relative size of the neighborhoods plays a large role in developing all three types of social capital, but the relationship with linking capital appears to be the strongest.

4.2.2 Resilience
The survey asked several questions about views on resilience. Select results are displayed below.

"What word do you most closely associated with resilience?"
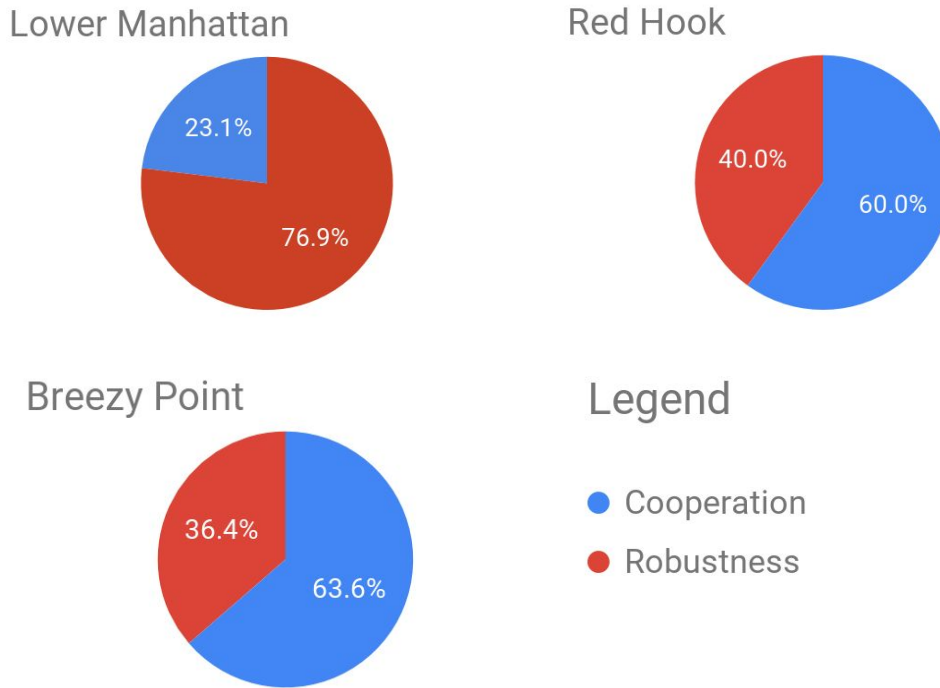
Lower Manhattan

23.1%

76.9%

Red Hook

40.0%

60.0%

Breezy Point

36.4%

63.6%

Legend

● Cooperation

● Robustness

Figure 15: Resilience as Robustness or Cooperation Responses, by Neighborhood

_____

"Resilience is primarily the responsibility of:"

Lower Manhattan

66.7%

Red Hook

21.4%

28.6%

42.9%

Breezy Point

31.8%

31.8%

Legend

● Private Sector
● Community Groups
● Government
● Individuals
● Government, Private Sector, Community Groups, and Individuals
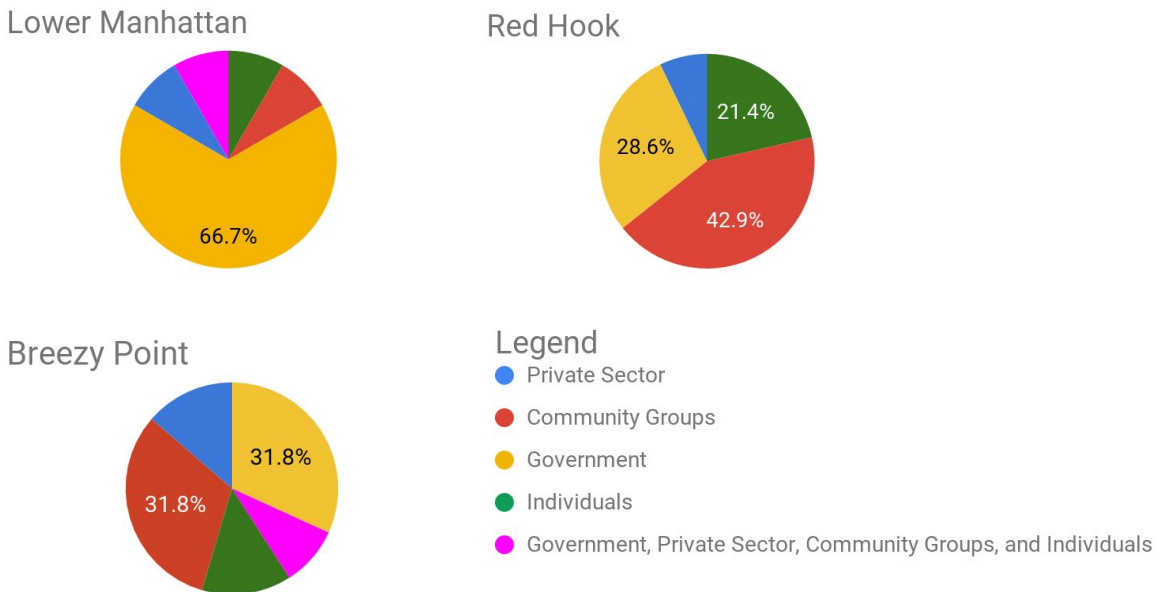
Figure 16: Views on Resilience Responsibility, by Neighborhood

_____

"I participated in the process of designing resilient cities in my neighborhood."

Lower Manhattan

92.3%

Red Hook

20.0%
33.3%
33.3%

Breezy Point

31.8%   22.7%
18.2%   27.3%
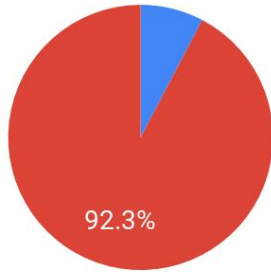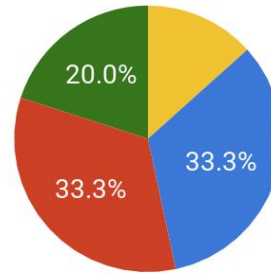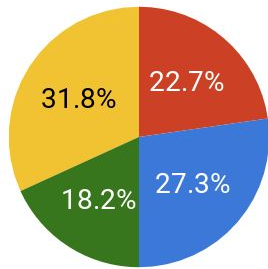
Legend
- 🔴 No, I could not or was not aware that I could participate
- 🔵 No, but I knew I could participate
- 🟢 Yes, I was very active in the process
- 🟡 Yes, but I was not very active process

Figure 17: Resilience Planning Participation Responses, by Neighborhood

_____

"When designing a resilience strategy, there should be a primary emphasis on:"

Lower Manhattan

23.1%   46.2%
30.8%

Red Hook

13.3%
46.7%
40.0%

Breezy Point

45.5%   50.0%
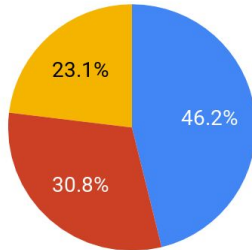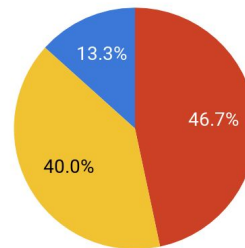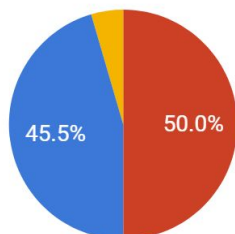
Legend
- 🔵 Strengthening infrastructure
- 🔴 Equal emphasis on strengthening Infrastructure and community
- 🟡 Strengthening community

Figure 18: Resilience by Strengthening Community or Infrastructure, by Neighborhood

Respondents from Lower Manhattan were the most likely to associate "resilience" with "robustness" rather than "cooperation." A number of respondents expressed skepticism about the extent that strengthening community bonds could improve resiliency. Red Hook and Breezy Point, conversely, reported associating cooperation more strongly with resilience. Lower Manhattan respondents were also the most likely to view resilience as responsibility of the government. All three neighborhoods viewed Government or Community groups as the ones primarily responsible for building resiliency with those answers amassing more the 60% of the responses in each data set.

About half of the respondents in each Red Hook and Breezy Point reported that they prefer an equal emphasis on strengthening the built environment and community. Respondents from Lower Manhattan were both mostly in favor of an emphasis on strengthening infrastructure (46%) and least likely to have been in their neighborhood during Hurricane Sandy (28%). Respondents from Lower Manhattan were also the least likely to have felt like they could had the opportunity to take a role in their neighborhood resilience plans. Their knowledge of resilience planning also tended to result from the high profile of the plans in media such as the New York Times, but not from community leaders.

Respondents from Breezy Point mentioned having conversations about resilience planning with neighbors more than respondents from Red Hook or Lower Manhattan.

5.0 Discussion

Both the neighborhood analysis and the survey results found the weakest sense of community in Lower Manhattan. The neighborhood is very intensely aligned with the function of the city and region as a whole and represents a large economic, transportation, political, and touristic hub. Resilience plans for the neighborhood represent a heavy bias for a built environment approach. Community in the neighborhood is sufficiently weak such that investments in increasing ties seem futiles. A larger portion of residents did not endure Superstorm Sandy and are less likely to see the value that community ties can provide in storm survival and recovery. Lower Manhattan, from the view of the city and state government, needs to be protected at all costs. Even if the neighborhood community had different ties and views on resilience, the balance of built environment and community approach would likely not be very different. There is such a concentration of political, economic, and transportation activity that require infrastructure to remain protected to maintain overall urban function.

The need for a heavy built environment approach to resilience derives the from the fact that New York is taking pursuing resilience via adaption, rather than transformation. Instead of rethinking New York developing dynamics that make the city extremely vulnerable if Lower Manhattan shuts down, city and state governments opt to pump tons of money into an elaborate extension of the island of Manhattan. Such extensive approaches are not being pursued in other vulnerable neighborhoods in Brooklyn, Queens, The Bronx, or Staten Island. There is widespread concern, however, that climate proofing Lower Manhattan with a raised land extension will protect the financial district but deflect water to southern Brooklyn and Staten Island. Movements to decentralize economic activity to Midtown Manhattan, Long Island City (Queens), and Downtown Brooklyn have been gradual and raise different urban concerns such as population displacement. Overall, adaptive measures like the ones pursued for Lower Manhattan demonstrate an "environmental machismo" which allows and encourages risky development strategies and lower community investment.   (Feuer, 2014)

Red Hook has relatively strong sense of community. However the community is divided between that within Red Hook Houses, a housing project, and a more affluent, whiter population among the commercial corridor. Respondents reported high feelings of bonding, bridging, and linking social capital. However, it is likely that these feelings are harbored within their respective neighborhood bubbles rather than for the entire Red Hook neighborhood.   Red Hook has moderate-to-high development utility for the city as a whole. A location next to the recently rezoned Gowanus and Sunset Park's new Industry City, a new ferry terminal for increase connectivity, and am aspiration to reinvent its port as the control center for New York's emerging offshore wind industry mean that developers and city officials see Red Hook as smart neighbrohood to spur growth.

Breezy Point has an extremely strong sense of community. It's small size and restrictive entry parameters ensure a strong community network. Survey results demonstrated the strongest feelings of bonding and linking social capital. Despite being the most homogenous of the three neighborhoods, respondents still self-reported high levels on bridging social capital compared to Lower Manhattan and Red Hook. Development utility, however, is much lower than the other two neighborhoods. It is the least urbanized, least connected, hosts the least economic activity, and has the greatest ability to oppose city projects that go against community wishes.

Red Hook's resilience framework marks a greater balance between built environment and community approaches. In terms of a cost breakdown, Red Hook has a greater bias

towards investments in the built environment than Breezy Point. The plans for strengthening community in Red Hook (relief center network, job training program, and financial assistance for economic resilience) center more directly around increasing local capacity and developing ties within the neighborhood. The community approach plans in Breezy Point (construction of community center, relocation of summer stores) are linked to pre-established goals of the neighborhood and achieved via upgrades in the built environment. This means that they are more expensive than those in Red Hook. Even though the objective is to strengthen the community, the means (built environment interventions) is costly.

From a more qualitative, as opposed to cost-based, analysis, Breezy Point demonstrates a stronger built environment bias than Red Hook. Although, both neighborhoods still have a significantly less bias towards built environment solutions than Lower Manhattan. Unlike Lower Manhattan, however, where community approaches are deemed insufficient to protect the neighborhood from flood risk, Breezy Point represents a sufficiently strong community that leverages its strong organization ties to push for more costly measures tied to enhanced community function regardless of pending flood damage. Red Hook's community social capital, although strong, cannot compare to that of a much smaller, cooperative-led community. Red Hook community social capital is still relatively weak enough that ensuring absorption of incoming residents and fostering greater bonds between its two prominent bubble community would yield a significant resilience upgrade. In tight-knit Breezy Point, the diminished returns on creating new social bonds means that plans are centered more about maintaining existing social bonds. An example of this is the fact that the NYRCR Committee for Red Hook decided to continue as a private organization named Resilient Red Hook. Breezy Point, through its cooperative, already had the social infrastructure to create neighborhood resilience infrastructure after the close of the New York Rising program. This functions as an example where an investment in strengthening community capacity and ties is more fitting in a neighborhood with the size and dynamics of Red Hook than that of Breezy Point.

As Mulligan et al (2016) explains, "community resilience" has risen as a popular buzzword for politicians in recent years because of its positive, yet vague, associations. However, as this paper has illustrated, heavy investment in developing community social capital is not always desired or appropriate for a city or neighborhood. Places with weak community are unreceptive to these types of interventions and places of very strong community experience diminishing returns. Top-down or middle-down attempts from local governments to facilitate community networks work best under specific conditions of pre-established community.

People are often rightly skeptical of large-scale and expensive resilience infrastructure, such as the Lower Manhattan Climate-Proofing Project, seem designed predominantly to protect the economic assets of the wealthy with public funding (Constantinides & Mesa). Community ties often yield better recovery and can be fostered with much lower costs (Aldrich & Meyer). Communities, however, are generally exclusive just as they are inclusive, and the philosophical question arises: is it just to require or assume that an individual have social bonds with their community in order to survive a shock event? The answer to that question will differ between cultures and between individuals. However, it is clear that an isolated pursuit of only built environment resilience or community resilience leaves vulnerability for a community, and policy makers need to make a concerted effort into striking an appropriate balance between the two based on the neighborhood context.

6.0 Conclusion

This paper sought to determine what neighborhood factors influence how local governments balance built environment and community as pathways to resilience by using a comparative case study of Lower Manhattan, Red Hook (Brooklyn), and Breezy Point (Queens). Results from the desk review of government reports, news media, and academic journals were triangulated with survey responses yielding the following findings: 1) neighborhoods with a low sense of community tend to favor built environment solutions and believe they should be provided by the government; 2) government bodies are likely to propose built environment interventions in neighborhoods with a high development utility, regardless of community views, because the primary interest is maintaining the neighborhood's economic, cultural, or practical function; 3) neighborhoods with moderate community social capital are likely to support and benefit the most from investments in community social capital; and 4) neighborhoods with sufficiently high community social capital such that they experience diminishing returns on investments in community social capital, can leverage their strong community to push for more costly investments in their built environment. The findings provide important insight into how government bodies approach resilience planning in different neighborhood contexts.

7.0 References

1. Abdurachman, F., Dean, A., & Paddock, R. C. (2018, October 3). A Tsunami Didn't Destroy These 1,747 Homes. It Was the Ground Itself, Flowing. *The New York Times*. Retrieved from

https://www.nytimes.com/2018/10/03/world/asia/indonesia-earthquake-tsunami-liquefacti on.html

2. Aldrich, D. P., & Meyer, M. A. (2014). Social Capital and Community Resilience. American Behavioral Scientist, 59(2), 254–269. https://doi.org/10.1177/0002764214550299

3. Annual Subway Ridership. (n.d.). Retrieved May 17, 2019, from http://web.mta.info/nyct/facts/ridership/ridership_sub_annual.htm

4. Bagli, C. V. (2018, January 3). Subway Stop and Housing for Red Hook Are Among Cuomo Proposals. *The New York Time*. Retrieved from https://www.nytimes.com/2018/01/03/nyregion/red-hook-subway-housing.html

5. Bloch, M., Cox, A., & Giratikanon, T. (2015, July 08). Mapping Segregation. *The New York Times*. Retrieved May 17, 2019, from https://www.nytimes.com/interactive/2015/07/08/us/census-race-map.html

6. Brudermann, Thomas, et al. "Behavioral Aspects of Urban Resilience." *Innovation and Supply Chain Management*, vol. 7, no. 3, Sept. 2013, pp. 83–91., doi:10.14327/iscm.7.83.

7. Chelleri, L., Waters, J. J., Olazabal, M., & Minucci, G. (2015). Resilience trade-offs: addressing multiple scales and temporal aspects of urban resilience. Environment and Urbanization, 27(1), 181–198. https://doi.org/10.1177/0956247814550780

8. Constantinides, C., & Mesa, N. (2019, March 25). Protect the whole city, not just one neighborhood. *Crain's New York*. Retrieved from https://www.crainsnewyork.com/op-ed/protect-whole-city-not-just-one-neighborhood

9. De Blasio, B. (2019, March 13). My New Plan to Climate-Proof Lower Manhattan. *New York Magazine*. Retrieved from http://nymag.com/intelligencer/2019/03/bill-de-blasio-my-new-plan-to-climate-proof-lower -manhattan.html

10. DeGregorio, E. (2019, February 14). Community Concerns Raised at Latest DCP Gowanus Rezoning Forum. *Star Revue*. Retrieved from http://www.star-revue.com/community-concerns-raised-at-latest-dcp-gowanus-rezoning-f orum/

11. Feuer, A. (2014, October 15). Building for the Next Big Storm After Hurricane Sandy, New York Rebuilds for the Future. *The New York Times*. Retrieved from

https://www.nytimes.com/2014/10/26/nyregion/after-hurricane-sandy-new-york-rebuilds-for-the-future.html

12. Goodall, J. (2016, July 25). Can New York Be Saved in the Era of Global Warming? *Rolling Stone*. Retrieved May 21, 2018, from

https://www.rollingstone.com/culture/culture-news/can-new-york-be-saved-in-the-era-of-global-warming-240454/

13. Grymbaum, M. M. (2016, February 3). Mayor de Blasio to Propose Streetcar Line Linking Brooklyn and Queens. *The New York Times*. Retrieved from https://www.nytimes.com/2016/02/04/nyregion/mayor-de-blasio-to-propose-streetcar-line-linking-brooklyn-and-queens.html

14. Hassler, Uta, and Kohler, Niklaus . "Resilience in the Built Environment." *Building Research & Information*, vol. 42, no. 2, 2014, pp. 119–129., doi:10.1080/09613218.2014.873593.

15. Hollnagel, E. (2011). Epilogue: RAG – The resilience analysis grid. In E. Hollnagel, J. Paries, D. D. Woods, & J. Wreathall (Eds.), Resilience engineering in practice: A guidebook. Farnham, UK: Ashgate.

16. Kaplan, T., & Hernandez, R. (2016, November 26). Cuomo, in Aid Appeal, Cites Broad Reach of Storm. *The New York Times*. Retrieved from https://www.nytimes.com/2012/11/27/nyregion/governor-cuomo-says-hurricane-sandy-was-worse-than-katrina.html

17. Kensinger, N. (2018, November 8). As Industry City gears up for rezoning, locals question who will benefit. *Curbed NY*. Retrieved from https://ny.curbed.com/2018/11/8/18075198/industry-city-sunset-park-brooklyn-gentrification-photo-essay

18. Meerow, S., Newell, J. P., & Stults, M. (2016). Defining urban resilience: A review. *Landscape and Urban Planning, 147*, 38-49. doi:10.1016/j.landurbplan.2015.11.011

19. Mulligan, M., Steele, W., Rickards, L., & Fünfgeld, H. (2016). Keywords in planning: What do we mean by 'community resilience'? *International Planning Studies, 21*(4), 348-361. doi:10.1080/13563475.2016.1155974

20. New York City Bus Maps. (n.d.). Retrieved May 17, 2019, from https://new.mta.info/maps/bus

21. New York Rising. (2014a, March). *Breezy Point NY Rising Community Reconstruction Plan*. Retrieved from https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/breezypoint_ny rcr_plan_20mb.pdf

22. New York Rising. (2014b, March). *Lower Manhattan NY Rising Community Reconstruction Program*. Retrieved from https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/lower_manhatt an_nyrcr_plan_57mb.pdf

23. New York Rising. (2014c, March). *Red Hook NY Rising Community Reconstruction Plan*. Retrieved from https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/redhook_nyrcr _plan_20mb_0.pdf

24. NYC Department of City Planning. (2014, September). *Existing Conditions and Brownfields Analysis - Red Hook, Brooklyn*. Retrieved from https://www1.nyc.gov/assets/oer/downloads/pdf/red-hook-brooklyn.pdf

25. NYC Department of City Planning (NYCDCP). (2018, July). *The Geography of Jobs*. Retrieved from https://www1.nyc.gov/assets/planning/download/pdf/about/dcp-priorities/data-expertise/n yc-geography-jobs-0718.pdf

26. NYC Mayor's Office of Long Term Planning and Sustainability. (2015, April 20). *One New York: The Plan for a Strong and Just City*. Retrieved from http://www.nyc.gov/html/onenyc/downloads/pdf/publications/OneNYC.pdf

27. NYC Mayor's Office of Sustainability. (2018, April 17). *Progress Report: OneNYC 2018*. Retrieved from https://onenyc.cityofnewyork.us/wp-content/uploads/2019/04/OneNYC-Progress-Report-2018.pdf

28. NYC Planning Population FactFinder (NYC PFF). (n.d.). Retrieved May 17, 2019, from https://popfactfinder.planning.nyc.gov

29. NYCEDC. (2018, May 8). *New York Works: NYCEDC Announces Transformation of South Brooklyn Maritime Shipping Hub, Creating over 250 Jobs in the Near-Term* [Press release]. Retrieved May 17, 2019, from https://www.nycedc.com/press-release/new-york-works-nycedc-announces-transformatio n-south-brooklyn-maritime-shipping-hub

30. NYCEDC. (2019, March). *Lower Manhattan Climate Resilience Study*. Retrieved from https://www.nycedc.com/sites/default/files/filemanager/Projects/LMCR/Final_Image/Lower_Manhattan_Climate_Resilience_March_2019.pdf

31. Office of the New York State Comptroller. (2018, March). An Economic Snapshot of the Rockaways. Retrieved from https://www.osc.state.ny.us/osdc/rpt13-2018.pdf

32. Rubinstein, D. (2016, September 13). Red Hook mega-development idea encounters some consternation, some applause. *Poltico*. Retrieved from https://www.politico.com/states/new-york/city-hall/story/2016/09/red-hook-mega-development-idea-encounters-some-consternation-some-applause-105404

33. Sciolino, E. (1984, September 10). A Cooperative on the Beach Love Privacy. *The New York Times*. Retrieved from https://www.nytimes.com/1984/09/10/nyregion/a-cooperative-on-the-beach-loves-privacy.html

8.0 Annexes

Annex 1: Questionnaire

Resilience Survey

My name is Thomas Schiefer. I'm a graduate student at the International University of Catalonia. This anonymous questionnaire is part of my thesis project on resilience planning in New York City. This survey will ask you several questions about your personal views on resilience and your sense of community within your neighborhood. I am looking to examine how community views influence resilience planning in different neighborhoods in NYC. These surveys will be filled out by residents of four neighborhoods (Lower Manhattan, Red Hook, Breezy Point, and Canarsie) and analyzed alongside neighborhood resilience plans. This survey should take between 5 and 10 minutes.

This survey is organized into four sections: Personal Demographics, Neighborhood Community, NYC Community, and Resilience.

Demographics

1) In which neighborhood do you currently reside?
   a) Lower Manhattan (this includes Two Bridges, the Seaport, the Financial District, the Battery, Battery Park City, and Tribeca)
   b) Red Hook, Brooklyn
   c) Breezy Point, Queens

2) How long have you lived in this neighborhood?
   a) Less than 2 years   c) 5 to 10 years
   b) 2 to 5 years   d) More than 10 years

3) What age group do you currently fall into?
   a) Under 18   d) 44-59
   b) 18-29   e) Over 60
   c) 30-44

4) How long have you lived in New York City?
   a) Less than 2 years   c) 5 to 10 years
   b) 2 to 5 years   d) More than 10 years

5) Which category best reflects your gender?
   a) Male   d) Other
   b) Female   e) I prefer not to respond
   c) Non-binary

6) Which category best reflects your race/ethnicity? Please select all that apply.
__ White/Caucasian   __ Asian/Pacific Islander
__ Black/African American   __ American Indian/Alaska Native
__ Hispanic/Latino   __ Other
__ I prefer not to respond

7) Is your place of work within or near your neighborhood?
a) Yes
b) No

Neighborhood Community

8) I have a strong sense of community within my neighborhood.
a) Strongly agree   d) Strongly Disagree
b) Agree   e) Disagree
c) Somewhat agree   f) Somewhat Disagree

9) I am a member of many organizations and community groups or volunteer within my neighborhood.
a) Strongly agree   d) Strongly Disagree
b) Agree   e) Disagree
c) Somewhat agree   f) Somewhat Disagree

10) If yes, what type of organizations and community groups? Check all that apply.
__ School District   __Professional
__ Community Group   __ Volunteering
__ Leisure/Social Organization

11) I devote a lot of time to organizations or community groups or volunteering within my neighborhood.
a) Strongly agree   d) Strongly Disagree
b) Agree   e) Disagree
c) Somewhat agree   f) Somewhat Disagree

12) I last attended a public event in my neighborhood:
a) In the last week   d) In the last year
b) In the last month   e) Over a year ago
c) In the last six months   f) Never

13) I have many close friends in my neighborhood.
a) Strongly agree   d) Strongly Disagree
b) Agree   e) Disagree
c) Somewhat agree   f) Somewhat Disagree

14) I have many acquaintances in my neighborhood.
- a) Strongly agree
- b) Agree
- c) Somewhat agree
- d) Strongly Disagree
- e) Disagree
- f) Somewhat Disagree

15) I frequently spend time in social situations with people in my neighborhood from different socio-economic groups.
- a) Strongly agree
- b) Agree
- c) Somewhat agree
- d) Strongly Disagree
- e) Disagree
- f) Somewhat Disagree

16) I frequently spend time in social situations with people in my neighborhood from different racial/ethnic groups.
- a) Strongly agree
- b) Agree
- c) Somewhat agree
- d) Strongly Disagree
- e) Disagree
- f) Somewhat Disagree

17) I frequently spend time in social situations with people in my neighborhood from different age groups.
- a) Strongly agree
- b) Agree
- c) Somewhat agree
- d) Strongly Disagree
- e) Disagree
- f) Somewhat Disagree

18) If I had a policy idea or an issue within my neighborhood, it would be easy for me to get in contact with a local government official.
- a) Strongly agree
- b) Agree
- c) Somewhat agree
- d) Strongly Disagree
- e) Disagree
- f) Somewhat Disagree

19) If I had a policy idea or an issue within my neighborhood, it would be easy for me to get in contact with leaders of local organizations.
- a) Strongly agree
- b) Agree
- c) Somewhat agree
- d) Strongly Disagree
- e) Disagree
- f) Somewhat Disagree

20) If there were an evacuation of the neighborhood, someone from my neighborhood would reach out to make sure I had evacuated.
- a) Strongly agree
- b) Agree
- c) Somewhat agree
- d) Strongly Disagree
- e) Disagree
- f) Somewhat Disagree

21) If yes, what type of relationship would you have with that person(s). Please check all that apply.

    __Family   __ Landlord   __ Professional
    __ Friend   __ Neighbor   __ Other

22) If there were an evacuation of the neighborhood, I would reach out to someone in my neighborhood to make sure they evacuated..
   a) Strongly agree
   b) Agree
   c) Somewhat agree
   d) Strongly Disagree
   e) Disagree
   f) Somewhat Disagree

23) If yes, what type of relationship would you have with that person(s). Please check all that apply.

    __Family   __ Landlord   __ Professional
    __ Friend   __ Neighbor   __ Other

NYC Community

24) I am members of many communities outside of my neighborhood within New York City.
   a) Strongly agree
   b) Agree
   c) Somewhat agree
   d) Strongly Disagree
   e) Disagree
   f) Somewhat Disagree

25) I have stronger ties with my communities outside of my neighborhood than with my neighborhood community.
   a) Strongly agree
   b) Agree
   c) Somewhat agree
   d) Strongly Disagree
   e) Disagree
   f) Somewhat Disagree

26) Most of my close friends live in other parts New York City.
   a) Strongly agree
   b) Agree
   c) Somewhat agree
   d) Strongly Disagree
   e) Disagree
   f) Somewhat Disagree

27) If I moved to another neighborhood in New York City, it would not significantly impact who I interacted with socially.
   a) Strongly agree
   b) Agree
   c) Somewhat agree
   d) Strongly Disagree
   e) Disagree
   f) Somewhat Disagree

Resilience

28) Which word do you most strongly connect with the concept of resilience?
   a) Robustness
   b) Cooperation

29) Which type of event do you most strongly connect with the concept of resilience?
   a) Storm/Natural Disaster
   b) Terrorist Attack
   c) Financial Collapse
   d) Technology Failure
   e) Other

30) Building a resilient community is a top priority for my neighborhood.
   a) Strongly agree
   b) Agree
   c) Somewhat agree
   d) Strongly Disagree
   e) Disagree
   f) Somewhat Disagree

31) I am aware of the plans and discussions concerning resilience in my neighborhood.
   a) Strongly agree
   b) Agree
   c) Somewhat agree
   d) Strongly Disagree
   e) Disagree
   f) Somewhat Disagree

32) I participated in the process of designing resilience plans in my neighborhood.
   a) Yes, I was very active in the process
   b) Yes, but I was not very active process
   c) No, but I knew I could participate
   d) No, I was not aware that I could participate

33) Building resilient cities is best when carried out by:
   a) Government
   b) Private Sector
   c) Individuals
   d) Community Groups
   e) Other: _____

34) Building resilient cities is primarily the responsibility of:
   a) Government
   b) Private Sector
   c) Individuals
   d) Community Groups
   e) Other: _____

35) The best way to improve the resilience of the neighborhood is through investments in the built environment. (This can include sea walls, back-up generators, drainage systems, and storm-proofing utilities).
   a) Strongly agree
   b) Agree
   c) Somewhat agree
   d) Strongly Disagree
   e) Disagree
   f) Somewhat Disagree

36) The best way to improve the resilience of the neighborhood is through investments in communities. (This can include establishing community coalitions, local education, relief networks, and creating a sense of community through public space activation).
    a) Strongly agree   d) Strongly Disagree
    b) Agree   e) Disagree
    c) Somewhat agree   f) Somewhat Disagree

37) When designing a resilience strategy, there should be a primary emphasis on:
    a) Strengthening infrastructure
    b) Strengthening community
    c) Equal emphasis on strengthening Infrastructure and community

38) When designing a resilience strategy, the majority of funds should be used for
    a) Strengthening infrastructure
    b) Strengthening community
    c) Equal emphasis on strengthening infrastructure and community

39) Did you reside in your current neighborhood during Superstorm Sandy?
    a) Yes
    b) No

40) If yes, how would you rate your neighborhoods preparedness during Superstorm Sandy?
    a) Very prepared
    b) Somewhat prepared
    c) Not prepared

41) How much more prepared would your neighborhood be if Superstorm Sandy happened today?
    a) Much more prepared
    b) Somewhat more prepared
    c) Equally prepared
    d) Less prepared
    e) Not Sure

Annex 2: Survery Responses - Lower Manhattan (39 Responses)			

Section 1 - Demographics			
Questions	Response	Number of Responses	Percent
How long have you lived in this neighborhood?	Less Than 2 Years	18	46.2
	2 to 5 Years	9	23.1
	5 to 10 Years	9	23.1
	More Than 10 Years	3	7.7
What age group do you currently fall into?	Under 18	0	0.0
	18-29	17	43.6
	30-44	16	41.0
	44-59	2	5.1
	Over 60	4	10.3
How long have you lived in New York City?	Less Than 2 Years	6	15.4
	2 to 5 Years	12	30.8
	5 to 10 Years	11	28.2
	More Than 10 Years	10	25.6
What category best reflects you gender identity?	Male	20	51.3
	Female	19	48.7
	Non-binary	0	0.0
	Other	0	0.0
	I prefer not to respond	0	0.0
What category best reflects your race/ethnicity? Select all that apply.	White/Caucasian	30	76.9
	Black/African-American	1	2.6
	Hispanic/Latino	5	12.8
	Asian/Pacific Islander	3	7.7
	American Indian/Alaska Native	0	0.0
	Other	0	0.0
	I prefer not to respond	0	0.0
Is your place of work within your neighborhood?	Yes	24	61.5
	No	15	38.5

Section 2 - Neighborhood Community			
Questions	Response	Number of Responses	Percent
I have a strong sense of community in my neighborhood.	Strongly Agree	3	7.7
	Agree	6	15.4
	Somewhat Agree	15	38.5
	Somewhat Disagree	6	15.4
	Disagree	9	23.1
	Strongly Disagree	0	0.0
I am a member of many organizations and community groups or volunteeer with my neighborhood.	Strongly Agree	0	0.0
	Agree	8	20.5
	Somewhat Agree	10	25.6
	Somewhat Disagree	1	2.6
	Disagree	17	43.6
	Strongly Disagree	3	7.7
If yes, what organizations and community groups? Check all that apply.	School District	0	0.0
	Community Groups	10	25.6
	Leisure/Social Organization	3	7.7
	Professional	4	10.3
	Volunteering	10	25.6
I devote a lot of time to organizations and community groups or volunteeer with my neighborhood.	Strongly Agree	0	0.0
	Agree	2	5.1
	Somewhat Agree	3	7.7
	Somewhat Disagree	4	10.3
	Disagree	23	59.0
	Strongly Disagree	7	17.9
I last attended a public event in my neighborhood:	In the last week	5	12.8
	in the last month	7	17.9
	in the last six months	6	15.4
	in the last year	0	0.0
	over a year ago	7	17.9
	never	13	33.3
I have many close friends in my neighborhood.	Strongly Agree	6	15.4
	Agree	6	15.4
	Somewhat Agree	9	23.1
	Somewhat Disagree	0	0.0
	Disagree	18	46.2
	Strongly Disagree	0	0.0
	Strongly Agree	3	7.7

I have many aquaintances in my neighborhood.	Agree	12	30.8
	Somewhat Agree	6	15.4
	Somewhat Disagree	3	7.7
	Disagree	15	38.5
	Strongly Disagree	3	7.7
I frequently spend time in social situations with people in my nieghborhood from different socio-economic groups.	Strongly Agree	0	0.0
	Agree	9	23.1
	Somewhat Agree	0	0.0
	Somewhat Disagree	9	23.1
	Disagree	12	30.8
	Strongly Disagree	9	23.1
I frequently spend time in social situations with people in my nieghborhood from different racial/ethnic groups.	Strongly Agree	2	5.1
	Agree	9	23.1
	Somewhat Agree	12	30.8
	Somewhat Disagree	3	7.7
	Disagree	9	23.1
	Strongly Disagree	3	7.7
I frequently spend time in social situations with people in my nieghborhood from different age groups.	Strongly Agree	0	0.0
	Agree	12	30.8
	Somewhat Agree	3	7.7
	Somewhat Disagree	0	0.0
	Disagree	18	46.2
	Strongly Disagree	6	15.4
If I had a policy idea or issue in my neighborhood, it would be easy for me to get in contact with a local government official.	Strongly Agree	0	0.0
	Agree	3	7.7
	Somewhat Agree	9	23.1
	Somewhat Disagree	6	15.4
	Disagree	15	38.5
	Strongly Disagree	6	15.4
If I had a policy idea or issue in my neighborhood, it would be easy for me to get in contact with leaders of local organizations.	Strongly Agree	0	0.0
	Agree	0	0.0
	Somewhat Agree	18	46.2
	Somewhat Disagree	6	15.4
	Disagree	12	30.8
	Strongly Disagree	3	7.7
If there were an evacuation of the neighborhood, someone from my neighborhood would reach out to make sure I had evacuated.	Strongly Agree	3	7.7
	Agree	6	15.4
	Somewhat Agree	9	23.1
	Somewhat Disagree	9	23.1
	Disagree	6	15.4
	Strongly Disagree	6	15.4
If yes, what type of relationship would have with that person(s). Please check all that apply.	Family	5	12.8
	Friend	13	33.3
	Landlord	10	25.6
	Neighbor	2	5.1
	Professional	2	5.1
	Other	4	10.3
If there were an evacuation of the neighborhood, I would reach out to someone in my neighborhood to make sure they evacuated.	Strongly Agree	8	20.5
	Agree	1	2.6
	Somewhat Agree	12	30.8
	Somewhat Disagree	1	2.6
	Disagree	2	5.1
	Strongly Disagree	0	0.0
If yes, what type of relationship would have with that person(s). Please check all that apply.	Family	5	12.8
	Friend	25	64.1
	Landlord	3	7.7
	Neighbor	14	35.9
	Professional	0	0.0
	Other	0	0.0
Section 3 - NYC Community			
Questions	Response	Number of Responses	Percent
I am members of many communities outside of my neighborhood within New York City.	Strongly Agree	4	10.3
	Agree	17	43.6
	Somewhat Agree	3	7.7
	Somewhat Disagree	6	15.4
	Disagree	8	20.5
	Strongly Disagree	4	10.3
	Strongly Agree	0	0.0
	Agree	12	30.8

I have stronger ties with my communities outside of my neighborhood than with my neighborhood community.	Somewhat Agree	12	30.8
	Somewhat Disagree	12	30.8
	Disagree	3	7.7
	Strongly Disagree	0	0.0
Most of my close friends live in other parts of New York City.	Strongly Agree	9	23.1
	Agree	21	53.8
	Somewhat Agree	1	2.6
	Somewhat Disagree	5	12.8
	Disagree	2	5.1
	Strongly Disagree	7	17.9
If I moved to another neighborhood in New York City, it would not significantly impact who I interacted with socially.	Strongly Agree	4	10.3
	Agree	32	82.1
	Somewhat Agree	0	0.0
	Somewhat Disagree	3	7.7
	Disagree	0	0.0
	Strongly Disagree	0	0.0
Section 4 - Resilience			
Questions	Response	Number of Responses	Percent
Which word do you most strongly connect with the concept of resilience?	Cooperation	30	76.9
	Robustness	9	23.1
Which type of event do you most strongly connect with the concept of resilience?	Storm/Natural Disaster	27	69.2
	Terrorist Attack	7	17.9
	Financial Collapse	0	0.0
	Technology Failure	0	0.0
	Other	2	5.1
I am aware of the plans and discussions concerning resilience in my neighborhood.	Strongly Agree	0	0.0
	Agree	3	7.7
	Somewhat Agree	7	17.9
	Somewhat Disagree	5	12.8
	Disagree	2	5.1
	Strongly Disagree	10	25.6
I participated in the process of designing resilience plans in my neighborhood.	Yes, I was very active in the process.	0	0.0
	Yes, but I was not very active in the process.	0	0.0
	No, but I knew I could participated.	3	7.7
	No, and I was not aware that I could participate	36	92.3
Building resilient cities is best when carried out by:	Government	15	38.5
	Private Sector	4	10.3
	Individuals	0	0.0
	Community Groups	11	28.2
	Other	6	15.4
Building resilient cities is primarily the responsibility of:	Government	24	66.7
	Private Sector	3	8.3
	Individuals	3	8.3
	Community Groups	3	8.3
	Other	3	8.3
The best way to improve the resilience of the neighborhood is through investments in the built environment. (This can include sea walls, back-up generators, drainage systems, and storm-proofing utilities).	Strongly Agree	9	23.1
	Agree	22	56.4
	Somewhat Agree	5	12.8
	Somewhat Disagree	2	5.1
	Disagree	1	2.6
	Strongly Disagree	0	0.0
The best way to improve the resilience of the neighborhood is through investments in communities. (This can include establishing community coalitions, local education, relief networks, and creating a sense of community through public space activation).	Strongly Agree	4	10.3
	Agree	20	51.3
	Somewhat Agree	11	28.2
	Somewhat Disagree	4	10.3
	Disagree	0	0.0
	Strongly Disagree	0	0.0
When designing a resilience strategy, there should be a primary emphasis on:	Strengthening Infrastructure	18	46.2
	Strengthening Community	9	23.1
	Equal Emphasis on Strengthening Infrastructure and Community	12	30.8
When designing a resilience strategy, the majority of funds should be used for:	Strengthening Infrastructure	15	38.5
	Strenghthening Community	1	2.6
	Equal Emphasis on Strengthening Infrastructure and Community	23	59.0
Did you reside in your current neighborhood durring Superstorm Sandy?	Yes	9	23.1
	No	30	76.9
If yes, how would you rate your neighborhood's preparedness?	Very Prepared	4	10.3
	Somewhat Prepared	2	5.1
	Not Prepared	3	7.7

How much more prepared would your neighborhood be if Superstorm Sandy happened today?	Much More Prepared	0	0.0
	Somewhat More Prepared	14	35.9
	Equally Prepared	4	10.3
	Less Prepared	2	5.1
	Not Sure	16	41.0

Annex 3: Survery Responses - Red Hook (48 Responses)			

Section 1 - Demographics			
Questions	Response	Number of Responses	Percent
How long have you lived in this neighborhood?	Less Than 2 Years	6	13.3
	2 to 5 Years	12	26.7
	5 to 10 Years	9	20.0
	More Than 10 Years	18	40.0
What age group do you currently fall into?	Under 18	0	0.0
	18-29	19	39.6
	30-44	17	35.4
	44-59	5	10.4
	Over 60	7	14.6
How long have you lived in New York City?	Less Than 2 Years	2	4.2
	2 to 5 Years	4	8.3
	5 to 10 Years	17	35.4
	More Than 10 Years	16	33.3
What category best reflects you gender identity?	Male	27	56.3
	Female	21	43.8
	Non-binary	0	0.0
	Other	0	0.0
	I prefer not to respond	0	0.0
What category best reflects your race/ethnicity? Select all that apply.	White/Caucasian	25	52.1
	Black/African-American	13	27.1
	Hispanic/Latino	7	14.6
	Asian/Pacific Islander	0	0.0
	American Indian/Alaska Native	0	0.0
	Other	0	0.0
	I prefer not to respond	3	6.3
Is your place of work within your neighborhood?	Yes	35	72.9
	No	13	27.1

Section 2 - Neighborhood Community			
Questions	Response	Number of Responses	Percent
I have a strong sense of community in my neighborhood.	Strongly Agree	18	37.5
	Agree	12	25.0
	Somewhat Agree	15	31.3
	Somewhat Disagree	0	0.0
	Disagree	3	6.3
	Strongly Disagree	0	0.0
I am a member of many organizations and community groups or volunteeer with my neighborhood.	Strongly Agree	6	12.5
	Agree	13	27.1
	Somewhat Agree	8	16.7
	Somewhat Disagree	6	12.5
	Disagree	5	10.4
	Strongly Disagree	13	27.1
If yes, what organizations and community groups? Check all that apply.	School District	5	10.4
	Community Groups	12	25.0
	Leisure/Social Organization	10	20.8
	Professional	6	12.5
	Volunteering	22	45.8
I devote a lot of time to organizations and community groups or volunteeer with my neighborhood.	Strongly Agree	6	12.5
	Agree	0	0.0
	Somewhat Agree	18	37.5
	Somewhat Disagree	6	12.5
	Disagree	15	31.3
	Strongly Disagree	3	6.3
I last attended a public event in my neighborhood:	In the last week	12	25.0
	in the last month	3	6.3
	in the last six months	10	20.8
	in the last year	11	22.9
	over a year ago	3	6.3
	never	9	18.8
I have many close friends in my neighborhood.	Strongly Agree	15	33.3
	Agree	6	13.3
	Somewhat Agree	18	40.0
	Somewhat Disagree	3	6.7
	Disagree	0	0.0
	Strongly Disagree	3	6.7
	Strongly Agree	27	56.3

I have many aquaintances in my neighborhood.	Agree	15	31.3
	Somewhat Agree	6	12.5
	Somewhat Disagree	0	0.0
	Disagree	0	0.0
	Strongly Disagree	0	0.0
I frequently spend time in social situations with people in my nieghborhood from different socio-economic groups.	Strongly Agree	15	31.3
	Agree	15	31.3
	Somewhat Agree	9	18.8
	Somewhat Disagree	6	12.5
	Disagree	3	6.3
	Strongly Disagree	0	0.0
I frequently spend time in social situations with people in my nieghborhood from different racial/ethnic groups.	Strongly Agree	12	25.0
	Agree	21	43.8
	Somewhat Agree	6	12.5
	Somewhat Disagree	6	12.5
	Disagree	0	0.0
	Strongly Disagree	3	6.3
I frequently spend time in social situations with people in my nieghborhood from different age groups.	Strongly Agree	15	31.3
	Agree	18	37.5
	Somewhat Agree	9	18.8
	Somewhat Disagree	0	0.0
	Disagree	0	0.0
	Strongly Disagree	6	12.5
If I had a policy idea or issue in my neighborhood, it would be easy for me to get in contact with a local government official.	Strongly Agree	6	12.5
	Agree	12	25.0
	Somewhat Agree	24	50.0
	Somewhat Disagree	0	0.0
	Disagree	3	6.3
	Strongly Disagree	3	6.3
If I had a policy idea or issue in my neighborhood, it would be easy for me to get in contact with leaders of local organizations.	Strongly Agree	9	18.8
	Agree	15	31.3
	Somewhat Agree	18	37.5
	Somewhat Disagree	0	0.0
	Disagree	3	6.3
	Strongly Disagree	3	6.3
If there were an evacuation of the neighborhood, someone from my neighborhood would reach out to make sure I had evacuated.	Strongly Agree	21	43.8
	Agree	15	31.3
	Somewhat Agree	9	18.8
	Somewhat Disagree	0	0.0
	Disagree	0	0.0
	Strongly Disagree	3	6.3
If yes, what type of relationship would have with that person(s). Please check all that apply.	Family	20	41.7
	Friend	37	77.1
	Landlord	6	12.5
	Neighbor	31	64.6
	Professional	11	22.9
	Other	6	12.5
If there were an evacuation of the neighborhood, I would reach out to someone in my neighborhood to make sure they evacuated.	Strongly Agree	25	52.1
	Agree	16	33.3
	Somewhat Agree	7	14.6
	Somewhat Disagree	0	0.0
	Disagree	0	0.0
	Strongly Disagree	0	0.0
If yes, what type of relationship would have with that person(s). Please check all that apply.	Family	29	60.4
	Friend	35	72.9
	Landlord	7	14.6
	Neighbor	36	75.0
	Professional	8	16.7
	Other	6	12.5
Section 3 - NYC Community			
Questions	Response	Number of Responses	Percent
I am members of many communities outside of my neighborhood within New York City.	Strongly Agree	9	18.8
	Agree	12	25.0
	Somewhat Agree	5	10.4
	Somewhat Disagree	2	4.2
	Disagree	14	29.2
	Strongly Disagree	6	12.5
	Strongly Agree	12	25.0
	Agree	9	18.8

I have stronger ties with my communities outside of my neighborhood than with my neighborhood community.	Somewhat Agree	6	12.5
	Somewhat Disagree	3	6.3
	Disagree	15	31.3
	Strongly Disagree	3	6.3
Most of my close friends live in other parts of New York City.	Strongly Agree	6	12.5
	Agree	15	31.3
	Somewhat Agree	17	35.4
	Somewhat Disagree	1	2.1
	Disagree	4	8.3
	Strongly Disagree	5	10.4
If I moved to another neighborhood in New York City, it would not significantly impact who I interacted with socially.	Strongly Agree	3	6.3
	Agree	21	43.8
	Somewhat Agree	4	8.3
	Somewhat Disagree	2	4.2
	Disagree	5	10.4
	Strongly Disagree	7	14.6

Section 4 - Resilience			
Questions	Response	Number of Responses	Percent
Which word do you most strongly connect with the concept of resilience?	Cooperation	27	60.0
	Robustness	18	40.0
Which type of event do you most strongly connect with the concept of resilience?	Storm/Natural Disaster	27	56.3
	Terrorist Attack	4	8.3
	Financial Collapse	4	8.3
	Technology Failure	0	0.0
	Other	0	0.0
I am aware of the plans and discussions concerning resilience in my neighborhood.	Strongly Agree	9	18.8
	Agree	8	16.7
	Somewhat Agree	19	39.6
	Somewhat Disagree	1	2.1
	Disagree	8	16.7
	Strongly Disagree	3	6.3
I participated in the process of designing resilience plans in my neighborhood.	Yes, I was very active in the process.	9	20.0
	Yes, but I was not very active in the process.	6	13.3
	No, but I knew I could participated.	15	33.3
	No, and I was not aware that I could participate	15	33.3
Building resilient cities is best when carried out by:	Government	12	25.0
	Private Sector	3	6.3
	Individuals	6	12.5
	Community Groups	16	33.3
	Other	8	16.7
Building resilient cities is primarily the responsibility of:	Government	12	28.6
	Private Sector	3	7.1
	Individuals	9	21.4
	Community Groups	18	42.9
	Other	0	0.0
The best way to improve the resilience of the neighborhood is through investments in the built environment. (This can include sea walls, back-up generators, drainage systems, and storm-proofing utilities).	Strongly Agree	20	41.7
	Agree	19	39.6
	Somewhat Agree	7	14.6
	Somewhat Disagree	2	4.2
	Disagree	0	0.0
	Strongly Disagree	0	0.0
The best way to improve the resilience of the neighborhood is through investments in communities. (This can include establishing community coalitions, local education, relief networks, and creating a sense of community through public space activation).	Strongly Agree	12	25.0
	Agree	24	50.0
	Somewhat Agree	8	16.7
	Somewhat Disagree	2	4.2
	Disagree	2	4.2
	Strongly Disagree	0	0.0
When designing a resilience strategy, there should be a primary emphasis on:	Strengthening Infrastructure	6	13.3
	Strengthening Community	12	26.7
	Equal Emphasis on Strengthening Infrastructure and Community	21	46.7
When designing a resilience strategy, the majority of funds should be used for:	Strengthening Infrastructure	7	14.6
	Strenghthening Community	12	25.0
	Equal Emphasis on Strengthening Infrastructure and Community	23	47.9
Did you reside in your current neighborhood durring Superstorm Sandy?	Yes	27	56.3
	No	21	43.8
If yes, how would you rate your neighborhood's preparedness?	Very Prepared	5	10.4
	Somewhat Prepared	20	41.7
	Not Prepared	11	22.9

How much more prepared would your neighborhood be if Superstorm Sandy happened today?	Much More Prepared	15	31.3
	Somewhat More Prepared	17	35.4
	Equally Prepared	2	4.2
	Less Prepared	0	0.0
	Not Sure	14	29.2

Annex 4: Survery Responses - Breezy Point (44 Responses)			

Section 1 - Demographics

Questions	Response	Number of Responses	Percent
How long have you lived in this neighborhood?	Less Than 2 Years	0	0
	2 to 5 Years	2	4.5
	5 to 10 Years	6	13.6
	More Than 10 Years	36	81.8
What age group do you currently fall into?	Under 18	0	0.0
	18-29	8	18.2
	30-44	6	13.6
	44-59	12	27.3
	Over 60	18	40.9
How long have you lived in New York City?	Less Than 2 Years	0	0.0
	2 to 5 Years	2	4.5
	5 to 10 Years	2	4.5
	More Than 10 Years	40	90.9
What category best reflects you gender identity?	Male	8	18.2
	Female	28	63.6
	Non-binary	0	0.0
	Other	0	0.0
	I prefer not to respond	0	0.0
What category best reflects your race/ethnicity? Select all that apply.	White/Caucasian	44	100.0
	Black/African-American	0	0.0
	Hispanic/Latino	0	0.0
	Asian/Pacific Islander	0	0.0
	American Indian/Alaska Native	0	0.0
	Other	0	0.0
	I prefer not to respond	0	0.0
Is your place of work within your neighborhood?	Yes	16	36.4
	No	28	63.6

Section 2 - Neighborhood Community

Questions	Response	Number of Responses	Percent
I have a strong sense of community in my neighborhood.	Strongly Agree	36	81.8
	Agree	6	13.6
	Somewhat Agree	0	0.0
	Somewhat Disagree	2	4.5
	Disagree	0	0.0
	Strongly Disagree	0	0.0
I am a member of many organizations and community groups or volunteeer with my neighborhood.	Strongly Agree	8	18.2
	Agree	12	27.3
	Somewhat Agree	14	31.8
	Somewhat Disagree	6	13.6
	Disagree	4	9.1
	Strongly Disagree	6	13.6
If yes, what organizations and community groups? Check all that apply.	School District	2	4.5
	Community Groups	16	36.4
	Leisure/Social Organization	24	54.5
	Professional	0	0.0
	Volunteering	22	50.0
I devote a lot of time to organizations and community groups or volunteeer with my neighborhood.	Strongly Agree	8	18.2
	Agree	6	13.6
	Somewhat Agree	12	27.3
	Somewhat Disagree	8	18.2
	Disagree	8	18.2
	Strongly Disagree	0	0.0
I last attended a public event in my neighborhood:	In the last week	8	18.2
	in the last month	16	36.4
	in the last six months	10	22.7
	in the last year	8	18.2
	over a year ago	2	4.5
	never	0	0.0
I have many close friends in my neighborhood.	Strongly Agree	30	68.2
	Agree	6	13.6
	Somewhat Agree	4	9.1
	Somewhat Disagree	4	9.1
	Disagree	0	0.0
	Strongly Disagree	0	0.0
	Strongly Agree	32	72.7

Question	Response	Number of Responses	Percent
I have many aquaintances in my neighborhood.	Agree	12	27.3
	Somewhat Agree	0	0.0
	Somewhat Disagree	0	0.0
	Disagree	0	0.0
	Strongly Disagree	0	0.0
I frequently spend time in social situations with people in my nieghborhood from different socio-economic groups.	Strongly Agree	10	22.7
	Agree	12	27.3
	Somewhat Agree	14	31.8
	Somewhat Disagree	4	9.1
	Disagree	4	9.1
	Strongly Disagree	0	0.0
I frequently spend time in social situations with people in my nieghborhood from different racial/ethnic groups.	Strongly Agree	6	13.6
	Agree	6	13.6
	Somewhat Agree	2	4.5
	Somewhat Disagree	16	36.4
	Disagree	12	27.3
	Strongly Disagree	2	4.5
I frequently spend time in social situations with people in my nieghborhood from different age groups.	Strongly Agree	12	27.3
	Agree	30	68.2
	Somewhat Agree	1	2.3
	Somewhat Disagree	0	0.0
	Disagree	0	0.0
	Strongly Disagree	0	0.0
If I had a policy idea or issue in my neighborhood, it would be easy for me to get in contact with a local government official.	Strongly Agree	10	22.7
	Agree	12	27.3
	Somewhat Agree	12	27.3
	Somewhat Disagree	8	18.2
	Disagree	2	4.5
	Strongly Disagree	0	0.0
If I had a policy idea or issue in my neighborhood, it would be easy for me to get in contact with leaders of local organizations.	Strongly Agree	16	36.4
	Agree	12	27.3
	Somewhat Agree	10	22.7
	Somewhat Disagree	4	9.1
	Disagree	2	4.5
	Strongly Disagree	4	9.1
If there were an evacuation of the neighborhood, someone from my neighborhood would reach out to make sure I had evacuated.	Strongly Agree	28	63.6
	Agree	8	18.2
	Somewhat Agree	6	13.6
	Somewhat Disagree	0	0.0
	Disagree	2	4.5
	Strongly Disagree	0	0.0
If yes, what type of relationship would have with that person(s). Please check all that apply.	Family	32	72.7
	Friend	36	81.8
	Landlord	2	4.5
	Neighbor	38	86.4
	Professional	12	27.3
	Other	6	13.6
If there were an evacuation of the neighborhood, I would reach out to someone in my neighborhood to make sure they evacuated.	Strongly Agree	32	72.7
	Agree	8	18.2
	Somewhat Agree	2	4.5
	Somewhat Disagree	0	0.0
	Disagree	0	0.0
	Strongly Disagree	0	0.0
If yes, what type of relationship would have with that person(s). Please check all that apply.	Family	34	77.3
	Friend	38	86.4
	Landlord	2	4.5
	Neighbor	38	86.4
	Professional	10	22.7
	Other	2	4.5

Section 3 - NYC Community			
Questions	Response	Number of Responses	Percent
I am members of many communities outside of my neighborhood within New York City.	Strongly Agree	4	9.1
	Agree	10	22.7
	Somewhat Agree	4	9.1
	Somewhat Disagree	10	22.7
	Disagree	14	31.8
	Strongly Disagree	2	4.5
	Strongly Agree	0	0.0
	Agree	6	13.6

I have stronger ties with my communities outside of my neighborhood than with my neighborhood community.	Somewhat Agree	4	9.1
	Somewhat Disagree	8	18.2
	Disagree	20	45.5
	Strongly Disagree	6	13.6
Most of my close friends live in other parts of New York City.	Strongly Agree	2	4.5
	Agree	12	27.3
	Somewhat Agree	6	13.6
	Somewhat Disagree	10	22.7
	Disagree	12	27.3
	Strongly Disagree	2	4.5
If I moved to another neighborhood in New York City, it would not significantly impact who I interacted with socially.	Strongly Agree	2	4.5
	Agree	10	22.7
	Somewhat Agree	6	13.6
	Somewhat Disagree	16	36.4
	Disagree	6	13.6
	Strongly Disagree	4	9.1
Section 4 - Resilience			
Questions	Response	Number of Responses	Percent
Which word do you most strongly connect with the concept of resilience?	Cooperation	28	63.6
	Robustness	16	36.4
Which type of event do you most strongly connect with the concept of resilience?	Storm/Natural Disaster	36	81.8
	Terrorist Attack	4	9.1
	Financial Collapse	2	4.5
	Technology Failure	0	0.0
	Other	2	4.5
I am aware of the plans and discussions concerning resilience in my neighborhood.	Strongly Agree	18	40.9
	Agree	16	36.4
	Somewhat Agree	8	18.2
	Somewhat Disagree	2	4.5
	Disagree	0	0.0
	Strongly Disagree	0	0.0
I participated in the process of designing resilience plans in my neighborhood.	Yes, I was very active in the process.	8	18.2
	Yes, but I was not very active in the process.	14	31.8
	No, but I knew I could participated.	12	27.3
	No, and I was not aware that I could participate	10	22.7
Building resilient cities is best when carried out by:	Government	4	9.1
	Private Sector	6	13.6
	Individuals	2	4.5
	Community Groups	26	59.1
	Other	3	6.8
Building resilient cities is primarily the responsibility of:	Government	14	31.8
	Private Sector	6	13.6
	Individuals	6	13.6
	Community Groups	14	31.8
	Other	4	9.1
The best way to improve the resilience of the neighborhood is through investments in the built environment. (This can include sea walls, back-up generators, drainage systems, and storm-proofing utilities).	Strongly Agree	24	54.5
	Agree	12	27.3
	Somewhat Agree	6	13.6
	Somewhat Disagree	2	4.5
	Disagree	0	0.0
	Strongly Disagree	0	0.0
The best way to improve the resilience of the neighborhood is through investments in communities. (This can include establishing community coalitions, local education, relief networks, and creating a sense of community through public space activation).	Strongly Agree	12	27.3
	Agree	16	36.4
	Somewhat Agree	8	18.2
	Somewhat Disagree	4	9.1
	Disagree	2	4.5
	Strongly Disagree	2	4.5
When designing a resilience strategy, there should be a primary emphasis on:	Strengthening Infrastructure	20	45.5
	Strenghtening Community	2	4.5
	Equal Emphasis on Strengthening Infrastructure and Community	22	50.0
When designing a resilience strategy, the majority of funds should be used for:	Strengthening Infrastructure	30	68.2
	Strenghtening Community	0	0.0
	Equal Emphasis on Strengthening Infrastructure and Community	14	31.8
Did you reside in your current neighborhood durring Superstorm Sandy?	Yes	40	90.9
	No	4	9.1
If yes, how would you rate your neighborhood's preparedness?	Very Prepared	2	4.5
	Somewhat Prepared	16	36.4
	Not Prepared	22	50.0

How much more prepared would your neighborhood be if Superstorm Sandy happened today?	Much More Prepared	20	45.5
	Somewhat More Prepared	20	45.5
	Equally Prepared	4	9.1
	Less Prepared	0	0.0
	Not Sure	0	0.0