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A. Strategy A

A1: Green Infrastructure Community Master Plan (with pilot projects)

Project Description

This project would create a master plan, in coordination with the forthcoming New York City Department of Environmental Protection (NYC DEP) drainage improvement plan for Southeast Queens, which would outline the strategic implementation of green infrastructure projects on public and private property throughout the Community. Green infrastructure—such as restoration of waterbodies and Bluebelts, Right-of-way (ROW) bioswales, green streets, and green roofs—would decrease the amount of stormwater that enters the system by capturing it upstream. These structures would also capture contaminants (e.g. sticks, oils, etc.) that would otherwise clog the sewer systems. These effects would reduce the occurrences and severity of sewer backups.

The objective of conducting the *Green Infrastructure Community Master Plan* is to develop a comprehensive strategy for implementing green infrastructure projects that will complement ongoing and planned expansion of the storm sewer system in the Community. DEP is currently scoping and procuring services to develop a broad drainage improvement study for the greater Southeast Queens area, extending beyond the Idlewild Watershed Communities. CDBG-DR funds would be leveraged to fund the *Green Infrastructure Community Master Plan* as a specific task within the scope of the greater Southeast Queens plan, tailored to the Community.

The recommendations of the master plan will be created in support of the DEP NYC Green Infrastructure Program. The NYC Green Infrastructure Program is a multiagency effort led by DEP to design, construct, and maintain green infrastructure on public property throughout New York City. The program presents a comprehensive approach to improving water quality that integrates green infrastructure, such as bioswales, rain gardens and green roofs, with grey infrastructure, such as upgrades to sewer system capacity and improvements to pump stations, for a cost-effective and sustainable approach to stormwater management.

The *Green Infrastructure Community Master Plan* will recommend best management practices to:

- Retain stormwater during rain events, to reduce the strain on the sewer system and reduce stormwater flooding;
- Decrease the cost and need for maintaining and upgrading stormwater infrastructure by implementing a green solution to water management;
- Improve water quality and assist the City with meeting permit requirements for its municipal separate storm sewer system (MS4);
- Reduce the effects of the urban heat island, reducing the amount of energy used to cool buildings;
- Improve air quality in the Community; and
- Promote ecosystem growth at proposed project locations.



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Green infrastructure best management practices may include (but are not limited to) cisterns and rain barrels, porous pavement, ROW bioswales, rain gardens, green roofs, and constructed wetlands. Green infrastructure projects could also include the protection and restoration of wetlands.

The scope of work for the *Green Infrastructure Community Master Plan* would begin with baseline studies that include a desktop review of existing GIS data (i.e., geology, property ownership, etc.) and drainage studies, completion of topographic and geotechnical surveys, and the development of impervious cover and sewershed mapping. Each of the best management practices listed above has specific conditions and siting requirements (e.g., porous pavement should not be sited in the parts of the Community with a high groundwater table). The baseline studies would be utilized to conduct a green infrastructure siting analysis which would recommend ideal locations for implementing green infrastructure best management practices. Identified locations will be subject to further study as deemed necessary (i.e., geotechnical borings, percolation testing, etc.). An estimated cost to implement the recommendations of the plan will be developed, including operations and maintenance costs, and life cycle costs will be calculated. An implementation schedule will be developed that identifies potential funding sources, partners and milestones. As part of this implementation schedule, the plan will identify ways to encourage or incentivize private property owners to implement green infrastructure. Private property owners would be encouraged to apply for partial funding through the NYC Green Infrastructure Plan's Green Infrastructure Grant Program, which has already committed \$11.5 million to 29 private property owners to build green infrastructure projects.

The Committee has identified several pilot projects to be studied in conjunction with the master plan to demonstrate green infrastructure implementation and effectiveness in the Idlewild Watershed Communities. Profiles for each project follow (A1a-A1f).

Cost

Approximately \$500,000



A1a: Brookville Park Pond Restoration

Project Description

As a pilot project for the *Green Infrastructure Community Master Plan*, the *Brookville Park Pond Restoration* aims to increase filtration of stormwater by using natural wetlands systems to effectively slow peak stormwater flows, increasing the capacity of receiving bodies, and improving water quality.

During Superstorm Sandy, tidal surge flowed from Jamaica Bay through the Idlewild Park Preserve wetlands into Brookville Park Pond (also known as Conselyeas Pond). The pond is surrounded by a biking/hiking trail, baseball and football fields, tennis courts, and a play area for young children. Superstorm Sandy caused water to overflow Brookville Park Pond, causing the area surrounding the Pond to flood, inundating the ball fields southwest of the park, as well as the pathways around the Pond.

This pilot project would consist of three phases, with all baseline surveys and project design occurring in the first phase.

Phase I: In addition to preparing design drawings for construction, the first phase would dredge the northern part of Brookville Park Pond, totaling 2.3 acres of siltation removal, and restore riparian plantings within a 4-foot wide planting area surrounding the perimeter of the Pond, totaling 6,600 sq. ft. of plantings.

Phase II: The second phase would dredge the stream corridor and restore the stream bank connecting the northern and southern parts of Brookville Park Pond, totaling 1,000 linear feet of stream restoration.

Phase III: The final phase of this project would dredge the southern part of Brookville Park Pond and restore riparian plantings within a 4-foot wide planting area surrounding the perimeter of the Pond, totaling 8,800 sq. ft. of riparian plantings.

Sediment removal would increase the stormwater storage capacity of the pond, while implementing green infrastructure around the pond would filter sediment and debris from future stormwater flows into the pond. The restored riparian zone would absorb water before it enters the pond, effectively increasing the retention capacity of the pond. The stream restoration would improve the drainage from the pond to the nearby wetlands, mitigating future flooding in the area.

Cost

The total capital cost for the project is estimated at approximately \$1.65 million, if the project were constructed in one phase. However, breaking the project into three phases would require multiple stages of construction mobilization and demobilization, as well as permitting. Therefore, the total capital cost for the phased project would be X, including:

- Phase I:
- Phase II:
- Phase III:



A1b: Community Gateway Green Streets

Project Description

As a pilot project for the *Green Infrastructure Community Master Plan*, this expansion of the Green Streets program—a component of the NYC Green Infrastructure Plan—aims to capture stormwater in order to reduce peak flows that contribute to flooding. *Community Gateway Green Streets* would construct right-of-way (ROW) bioswales at community gateways to increase resiliency through stormwater retention and treatment, while improving the streetscape, fostering a sense of place, and supporting local business growth.

The project would include construction of bioswales and rain gardens and planting of new street trees and stormwater tree pits along three key gateways to the Community:

- Francis Lewis Boulevard between 248th Street and Brookville Boulevard, Rosedale;
- 225th Street between South Conduit Boulevard and 145th Road, Brookville; and
- The crossroads of Farmers Boulevard and Guy Brewer Boulevard (this would encompass both sides of Farmers Boulevard and Guy Brewer Boulevard from 147th Avenue to Conduit Avenue), Springfield Gardens.

These green streets would help mitigate the stormwater flooding that is common to these areas by intercepting and slowing runoff. Slowing stormwater runoff before it reaches the east-west force main that runs along 147th Avenue would reduce the strain on the sewer system, leading to less water flowing into Thurston Basin. Because groundwater is more than nine feet below street level in these areas, green infrastructure would be feasible.

The new green infrastructure would be part of more comprehensive streetscape improvements including lighting, paving, and street furniture. Strategic investment to improve the quality of the public realm at these key community gateways would be aimed at improving the streetscape at entrances to the Community and attracting private investment to increase retail offerings that better serve the local market. Expanding and improving the range of retail amenities in local neighborhood nodes will help increase the ability of local residents to obtain food and other daily needs in the aftermath of major storm events. It will also decrease the need for local residents to travel outside the Community, which has proven to be difficult due to frequent flooding along the area's major east-west streets.

An additional co-benefit of siting the proposed green streets at highly visible key gateways to the Community is to help raise awareness of the value of stormwater management. All three locations also have either train or bus facilities:

- Francis Lewis Boulevard is the primary pedestrian route for residents to access the Rosedale LIRR station;
- 225th Street is a primary pedestrian route for residents to access the Laurelton LIRR station and the Q85 bus route along Conduit Boulevard;
- The Farmers Boulevard / Guy Brewer Boulevard crossroad has three bus stops;



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The proximity of these Community Gateways to local rail stations and along existing bus corridors could promote transit oriented land uses and increase opportunities for transit connections within the Community. As such, addressing localized flooding in these areas will also increase the Community's resilience by improving access to transit.

The location and construction of green streets will conform to the design guidelines provided by the NYC Department of Transportation (DOT) Street Design Manualⁱ and NYC Department of Environmental Protection (DEP) Standards for Green Infrastructureⁱⁱ which provide specifications for the siting and implementation of green infrastructure. These guidelines provide general considerations and design principles typical of a green stormwater solution and identify city-led strategies for managing stormwater in targeted areas that have the greatest need. The underlying stormwater system will also be considered to maximize the effectiveness of these green streets.

The Committee has the choice of choosing any combination of the possible locations for green infrastructure upgrades. The benefit of choosing only one site is the reduced cost of the overall project. On the other hand, developing green infrastructure at all three sites yields greater cost efficiency by combing project administration fees and contract support. It should also be noted that this project is eligible for funding through the Green Infrastructure Grant Program (a grant within the NYC Green Infrastructure Program), which has already funded \$11.5 million to 29 private property owners for the implementation of green infrastructure.

Cost

Francis Lewis Boulevard between 248th Street and Brookville Boulevard: Approximately \$1.15 million

225th Street between South Conduit Boulevard and 145th Road: Approximately \$900,000

Farmers Boulevard and Guy Brewer Boulevard: Approximately \$1.1 million

All 3 sites as one project: Approximately \$2.9 million



A1c: Twin Pond Park Bluebelt Enhancement

Project Description

As a pilot project for the Green Infrastructure Community Master Plan, the *Twin Pond Park Bluebelt Restoration* would increase stormwater filtration by using natural wetlands systems around the perimeter of the Ponds to effectively slow peak stormwater flows and improve water quality.

The New York City Department of Environmental Protection (NYC DEP) Bluebelt program provides an ecologically sound and cost-effective drainage system that captures stormwater and directs it to one of several facilities known as Best Management Practices (BMPs). BMPs include constructed wetlands, stormwater detention ponds, and stream restoration projects. BMPs serve the role of mitigating the negative effects of discharging stormwater into the environment.

In 2013, DEP began dredging Springfield Lake as part of Phase IV of its \$175 million upgrade of sewer and water infrastructure in Southeast Queens to alleviate flooding. The Springfield Lake is part of a new network of nearly 10 acres of Bluebelt wetlands that will receive and filter stormwater before it is released into Jamaica Bay. DEP is currently planning a similar Bluebelt project at Twin Ponds, which will include the installation of stormwater outfalls.

Twin Pond Park Bluebelt Restoration will supplement NYC DEP's current project by clearing any debris and dead trees from the ponds, restoring wetlands within the riparian zone, and installing a porous pavement walkway surrounding the ponds for passive recreation. Wetlands restoration would enhance existing four foot wide riparian plantings which include native grasses and emergent wetland species. The Bluebelt project would lead stormwater away from the area around Twin Ponds Park—including Merrick, Brookville, and Hook Creek Boulevards—and into the restored wetlands located near the ponds. These wetlands would filter stormwater before it flows into the Ponds, which will slow the pace of runoff and improve water quality. This restoration project would enhance ecosystem health and restore habitat near Twin Ponds, while increasing the storage capacity of the ponds.

The passive pedestrian walkway surrounding the ponds would both capture stormwater and allow it to infiltrate where it falls, while improving the public use, enjoyment and quality of life in the Park.

Cost

Approximately \$850,000



A1g: Green Infrastructure Pilot Project (School Green Roof and Raingarden)

Project Description

As a pilot project for the *Green Infrastructure Community Master Plan*, the *Green Infrastructure Pilot Project* seeks to capture stormwater at a public facility, such as a school, in order to reduce peak flows that contribute to flooding. This project would include construction of a green infrastructure pilot project at a public school within the Community, consisting of a green roof, rain garden, and porous pavement, serving as a demonstration of various green infrastructure Best Management Practices (BMPs).

Public facilities would be evaluated throughout the Communities as potential locations for this green infrastructure pilot project. Several factors contribute to the selection of an appropriate site for rain gardens and porous pavement, including site geology (soils permeability, depth to water table and depth to bedrock), site geometry (size of the potential site, open areas of potential green infrastructure implementation), topography and sewer infrastructure (direction of flow). Suitability for a green roof was evaluated through a desktop review of aerial photographs to identify flat roofs with limited utility systems. Schools north of 147th Avenue would be an ideal candidate for green infrastructure implementation due to the combined sewer line that runs underneath 147th Avenue. Stormwater and sanitary flows combine into that pipe and flow to Owls Head Water Pollution Control Plant. Capturing stormwater at schools north of this pipe would reduce stormwater volumes entering the combined sewer system during a rain event by capturing it where it falls, detaining it on-site, and allowing it to release slowly into the ground through green infrastructure. A location along a combined sewer is beneficial as it could reduce both stormwater flooding as well as combined sewer overflow events to improve water quality.

The green roof would cover nearly the entire rooftop of the school, aside from utilities systems located on the rooftop, spanning approximately 24,000 square feet (rough estimate pending selection of a specific location). It would utilize a modular green roof technology with an engineered growing medium intended to be self-sustaining, designed to be easily maintained. Porous asphalt would be installed in general areas of the school parking lot not presently used for recreation, spanning approximately 10,000 square feet. Both the green roof and porous pavement would capture rain water where it falls, mimicking natural pervious surfaces. The green roof would slowly release filtered stormwater into the drainage system, while the porous pavement would allow water to filter through various layers of gravel and sand into the soil. Raingardens would be installed to capture runoff flowing from adjacent sidewalks.

The results of the project can be quantified through the stormwater volume absorbed by the green infrastructure, reduction in energy costs due to the cooling effects of the green roof, and avoided costs due to the reduced need to upgrade traditional stormwater infrastructure.



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Through educational signage and associated development of educational materials and curricula, in addition to transparency of the project results, the pilot project would illustrate the benefits of green infrastructure to students and the larger community.

This project could possibly be funded by a grant through the NYC Department of Environmental Protection's (DEP) NYC Green Infrastructure Plan. Within the Green Infrastructure Plan, the DEP, Trust for Public Land (TPL), School Construction Authority (SCA), the Department of Parks and Recreation (DPR), and the Department of Education (DOE) have collaborated to provide funding for the construction of green infrastructure at public school playgrounds. The collaboration has already identified 10 recipients—2 recipients already have constructed the green infrastructure—for a total of up to \$5 million in funding. This project could be eligible for the next round of funding, which would greatly decrease the cost of this project to the Community.

Cost

Approximately \$1.25 million



A5: Coastal Management Plan

Project Description

The southern part of the Idlewild Watershed Communities includes Idlewild Park Preserve and is bordered by Hook Creek and the Head of Bay. Areas surrounding Idlewild Park Preserve experience recurring flooding, including Rosedale south of 147th Avenue, Brookville in the vicinity of Brookville Park, and Springfield Gardens southwest of Guy Brewer Boulevard as well as in the vicinity of Springfield Park south of 145th Avenue. There are a variety of economic assets here, ranging from small businesses that employ up to 20 people and select large businesses that have a workforce of up to 500 people. Three key roads in the area, Hook Creek Boulevard, Rockaway Boulevard, 147th Ave, and Brookville Boulevard, provide access points to and from surrounding communities. In addition, the Rosedale Pumping Station is a key infrastructure asset that pumps water away from the Combined Sewer Overflows located in Thurston Basin.

The areas described above are in a low lying area that is vulnerable to tidal flooding. Most of the tidal inundation during Superstorm Sandy was water that flowed in from Jamaica Bay and entered the Community through Hook Creek and Thurston Basin. During Superstorm Sandy, many of the homes, businesses, and roads were flooded in these neighborhoods. In addition, Rosedale Pumping Station lost functionality during the storm, leading to 6.8 million gallons of untreated sewage overflows discharging into Thurston Basinⁱⁱⁱ. A comprehensive coastal management plan is needed to prioritize improvements and integrate flood protection measures that mitigate the flood risk to the Community with broader objectives such as economic development, recreation, and public health.

This project would be focused on developing strategies to protect low lying areas that are prone to tidal flooding at certain flood levels and studying the impacts of various coastal defenses for mitigation of tidal flooding at a regional scale, serving to protect the Community and parts of adjacent Nassau County. This study would be completed in coordination with the NYRCR Five Towns Project *Rockaway Turnpike/Nassau Expressway Resilient Corridor Study* as well as other regional coastal protection projects.

Among the potential coastal defense measures that would be studied are: a berm along the perimeter of the Idlewild Park Preserve to block minor storm surges; and tide gates at Hook Creek to prevent water from flooding the creek and the surrounding area. The project would investigate the technical feasibility of these measures, the possible regional coordination that the implementations may require, and the timeline, estimated cost, and schedule to implement the potential projects.

A potential recommendation of this project would be to construct a berm that begins south of Springfield Park, continues along the northern border of Idlewild Park Preserve, and ends at the kayak and canoe launch near Hook Creek (Figure X). Future extensions could implement a floodgate at Hook Creek and continue the berm into North Woodmere Park. The extension would construct a floodgate to allow the flow of water during regular conditions and block water from flooding the creeks during flood events. The berm could also include a bike path or walking trail on top of it. The bike path or trail would



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allow travel between key points along the berm, including Springfield Park, P.S. 181 Brookfield, Brookville Park, and the kayak and canoe launch at the end of Huxley Street on Hook Creek.

The berm would serve as a tidal barrier that would supplement the wetlands in Idlewild Park Preserve. It would be designed to a height of 14 ft., which is equal to the base flood elevation plus 3 ft., and would be able to stop 50-year floods from reaching certain areas in the Community. The berm would not protect these areas against a 100-year flood because Hook Creek would flood around the berm from the east. However, it would provide protection against lower, more frequent levels of tidal flooding. Bioswales and culverts would be built along the berm to maintain the drainage of stormwater that would flow downstream into the Idlewild Park Preserve wetlands.

The potential flood gates along Rockaway Turnpike, as advocated for in Project D6 *Support Rockaway Turnpike/Nassau Expressway Resilient Corridor Study (NYRCR Plan for the Five Towns)*, would provide an additional level of resiliency by protecting against a 100-year flood. Pairing these two projects together offers a tiered approach to resiliency. If this regional strategy were implemented, then a berm would protect against smaller, more frequent, 50-year storm events, while the regional project would protect against larger, less frequent, 100-year storm events.

Cost

\$465,000



A2: NYC DEP Oyster Restoration in Thurston Basin

Project Description

During Superstorm Sandy, tidal flows surged through Jamaica Bay into Thurston Basin and the wetlands of the Idlewild Park Preserve. Successful oyster restoration in the Thurston Basin may be able to slow tidal surge flows into the Basin and adjacent wetlands.

Oyster restoration has been proposed by New York City Department of Environmental Protection (DEP) for Thurston Basin, but is not yet funded. The head of Thurston Basin is three feet deep which is suitable for restoration of oyster reefs. Shallow parts of the Basin along Idlewild Park Preserve have the potential to offer opportunities for other aquatic habitat restoration. Oyster restoration in Thurston Basin can lead to a series of protective oyster reefs that can dissipate wave energy and slow tidal flows. Oyster restoration would also improve the habitat and health of both Thurston Basin, known as a top location for bird watching in New York State, as well as adjacent Idlewild Park Preserve.

This project would provide support for DEP's project to establish oyster reefs in Thurston Basin by providing funds to initiate the project. Oyster restoration in Thurston Basin is an effective and resilient project complimentary to the ongoing Hudson-Raritan Estuary projects such as the Jamaica Bay Oyster Bed Pilot project and the New York Harbor Schools Billion Oysters Project in addition to other projects initiated by NY/NJ Baykeeper.

Oysters have the following benefits:

- Oysters are an indicator species and can be used to gather information on overall health of the estuary;
- Oyster reefs can provide habitat for many other marine organisms;
- Oyster reefs can improve water quality and protect shorelines by reducing wetland fringe erosion and stabilizing banks; and
- Oysters are filter-feeders that can improve water quality through filtration of sediments and other contaminants, such as nitrogen, fine sediments and toxins from water column.
- Through the above benefits, oysters will improve the overall health of the wetlands surrounding Thurston Basin. This improved health would enhance the function of the wetlands as a tidal barrier.

Cost

- Approximately \$250,000



Strategy A Advocacy Projects:

A1d: Advocate for Construction of Thurston Basin Park

During Superstorm Sandy, tidal flows surged through Jamaica Bay into Thurston Basin and the wetlands of the Idlewild Park Preserve. This project would restore the health of the wetlands in Thurston Basin. Restoring wetlands in Thurston Basin would serve to increase their ability to absorb tidal flows from Jamaica Bay. The restoration and creation of wetlands along the Thurston Basin can increase the acreage of wetlands on the east side of the creek to approximately 7 acres^{iv}, therein increasing the water retaining capacity of Thurston Basin.

The objective of this project is to advocate that New York City Department of Parks and Recreation begin construction of the already-funded plan to build a park at the southern end of Thurston Basin. The Committee also advocates that the City include comfort stations as part of the park construction near the planned kayak launch. The proposed comfort stations would increase the usage of the future kayak launch, which will generate public interest in the area, promoting the protection and further restoration of the Thurston Basin wetlands.

A1f: City Purchase of Privately-Owned Parcels on Edges of Idlewild Park Preserve

Phase I: City Purchase of Privately-Owned Parcels

New York City public agencies own most of the area in the Idlewild Park Preserve. Within this area of ownership, City agencies are able to initiate programs to protect and restore wetlands. However, within privately-owned parcels, they are unable to take action to preserve wetlands.

This project advocates that City funds be used to acquire the 64 vacant privately-owned parcels within and adjacent to Idlewild Park Preserve. The purchase of these areas would provide public agencies with the jurisdiction to initiate steps to restore and protect the wetlands in the purchased areas.

Phase II: Restoration of Wetlands within Purchased Parcels

Approximately XX% of the area in the parcels purchased in Phase I of this project will be wetlands. This phase of the project would restore the remaining areas as wetlands. As with all wetland restoration projects, the results of the restoration would increase the Idlewild Park Preserve's capacity to retain water and improve health of the ecosystems residing in the restoration area. The increased water capacity of the wetlands and improved health of their ecosystems would increase its function as a tidal barrier. This is important for the Communities, since the Idlewild Park Preserve is a natural tidal barrier against flood surges coming from Hook Creek and Thurston Basin.

A4: Idlewild Park Preserve Culvert Expansion

Currently, there is a culvert within Idlewild Park Preserve that allows water to flow beneath a service road used by JFK Airport. This culvert allows the passage of water to and from the east and west sides of the Idlewild Park Preserve, impacting the surrounding wetlands that provide major water retention capacity for the Community.



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The culvert is undersized for the volume of water passing through it, resulting in flooding of the service roadway during Superstorm Sandy, and affecting the hydrology of the adjacent wetlands. This project would advocate for the expansion of this culvert by reconstructing the existing culvert opening to provide a larger pass through for water and adding additional culverts for more channels for water flow. Expansion of the existing culvert would improve tidal flow, improve the health of presently impacted wetlands in the preserve, allow for the passage of sediment and water during surge events (improving sediment water balance) and provide infrastructure stability for the roadway.

Improved tidal flow would help to restore areas that are not adequately inundated twice per day with tidal water to support natural vegetation. Improved health of the natural vegetation would help stabilize the wetland ecosystem and stabilize the functionality of the wetlands as a tidal barrier. In addition, improving tidal flow would improve local hydrology to increase the water capacity of the wetlands during tidal surges, mitigating flood effects.



B. Strategy B

B1: Southeast Queens Disaster Preparedness and Recovery Plan

Project Description

The Idlewild Watershed Communities require a coordinated planning effort among agencies, nonprofit organizations and Community Emergency Response Teams (CERT) to strengthen disaster preparedness and emergency response, in coordination with New York City Office of Emergency Management (OEM) and other relevant City, State, and Federal agencies. There are two Phases to this project. The first phase will include development of a comprehensive disaster preparedness and recovery plan for the Community. The second phase will implement selected recommendations from the phase I plan. Project descriptions for both phases are below.

Phase I: Establish COAD and Develop a Southeast Queens Disaster Response and Preparedness Plan

Phase 1a: The first step in the planning process would be to establish a Community Organizations Active in Disasters (COAD) that would serve as the advisory committee to oversee development and implementation of the *Southeast Queens Disaster Preparedness and Recovery Plan*. In addition to being responsible for planning and oversight, the COAD would coordinate activities among and between groups for the mutual benefit of the greater Southeast Queens region. The COAD would build upon established networks between existing community groups to expand services to provide disaster recovery assistance and training, develop relationships with citywide and regional agencies to ensure communications in times of crisis, and facilitate communication and shared resources between COAD members.

Phase 1b: The second step in the planning process is to develop the Southeast Queens Disaster Preparedness and Recovery Plan. The objective of the Plan is to build capacity for the Community to respond effectively to a range of hazards. The scope of the *Southeast Queens Disaster Preparedness and Recovery Plan* includes:

- Identify assets and vulnerabilities of local not-for-profit organizations, and define roles and responsibilities of COAD member groups in disaster response (e.g., the CERT may need additional training programs for locally specific disaster threats, fixed resources, equipment storage, etc.)
- Identify existing social services facilities that could operate as Resource and Recovery Centers in the Community (e.g., Rosedale Library, P.S. 138, Springfield High School, P.S. 52). The facilities would also provide for coordination of emergency and relief services following a disaster, such as access to food, water, power, medical services, information, and special services for vulnerable populations. Assess the feasibility of these facilities to serve this purpose and determine necessary resiliency improvements (e.g., meeting space for the CERT and/or COAD, backup power supply, warming and cooling centers, charging stations).
- Determine protocols for effective communication between the COAD and other community based organizations with NYC OEM and City agencies.



- Provide recommendations for improving standard evacuation procedures during major storm events. Determine the evacuation and disaster response needs for vulnerable populations, including seniors. This includes evaluating the creation of a localized, horizontal Naturally Occurring Retirement Community (NORC).
- Training or education programs to train member organizations of the COAD.
- Determine the training and education needs for local residents for disaster preparedness and recovery.

Phase II: Implement selected Recommendations of the Disaster Response and Preparedness Plan

The second phase of this project would provide assistance to the local COAD to implement the recommendations of the *Southeast Queens Disaster Response and Preparedness Plan*. Such recommendations may include the following measures, subject to the findings of the Plan:

- Create a registry of privately-owned recovery equipment and a plan for Community Use during disaster recovery (e.g., generators, radios, space heaters, wet vacuums).
- Fixed assets for COAD members engaged in emergency response or preparedness.
- Establishment of Resource and Recovery Centers.
- Installation of a generator at the Resource and Recovery Center—The generator will be able to provide backup power to the Center during power outages. A phone charging station and a wi-fi network can be connected to the generator, which would enable the reliable use of communication devices during disaster events.
- Educational materials and storm recovery assistance to vulnerable populations, including seniors.
- Creating a voluntary registry of elderly residents for use by the newly created COAD, NORC, CERT, and other community groups to provide evacuation assistance, medical supplies during power outages, and check on residents after disasters.
- Advocating for NYC OEM to update and improve signage directing residents to evacuation centers.
- Creating a task force among local civic associations to coordinate with NYC OEM that will develop locally relevant Homeowner Education and Storm Preparedness materials that are targeted directly towards the needs of the Idlewild Watershed Communities.
- Implement a pilot project for a Locally-Based Evacuation Strategy—The strategy is envisioned as a comprehensive approach to disaster preparedness that extends beyond questions from the Community about evacuation routes or Evacuation Centers. The strategy would include development of a plan with community based organizations and outreach/education for residents and businesses to establish in advance personalized evacuation plans (i.e., route, location, shelter, etc.).

Cost

- Phase I Development: Approximately \$230,000
- Phase II Implementation: Approximately \$500,000



C. Strategy C

C1: Home and Business Owner Education and Technical Assistance Program

Project Description

This program will educate and provide technical assistance to the Communities' homeowners and business owners interested in improving their resiliency. According to preliminary FIRM maps, a number of residential and commercial parcels have been added to the 100 year flood zone. As residents and business owners now face new requirements and challenges related to flooding and flood insurance, they will need help understanding their options. The goal of this program is to streamline the education process, help home and business owners understand flood insurance options and requirements, and provide them with practical and concrete steps to increase their home or business's resiliency.

A storefront resource center in the Communities for homeowner and business owner education will be a key component of the program. The resource center would ideally co-locate with an existing not-for-profit in the Communities. Educational materials will be maintained at the storefront (with funding for two years) as well as on an online clearinghouse. There will be trained staff on site to answer questions as well as to perform individual building audits, which will ultimately provide homeowners with a Resiliency Needs Assessment report and business owners with a Business Continuity Needs Assessment report. The Communities may partner with other organizations and communities (such as Rockaway East and Lower Manhattan) that have been working on similar educational programs.

The educational portion of the program will provide home owners and business owners with guidance relating to flood insurance and flood risk as well as resiliency measures that they can take. Educational programs would leverage existing programs conducted by DEP by providing funding for components which the agency cannot fund, such as home resiliency improvements. The programs will also combine educational materials from other City agencies, creating a suite of materials with interagency information.

The NYC Department of City Planning's report, *Retrofitting Buildings for Flood Risk (October, 2014)* is a resource that should be utilized to help property owners understand how they can adapt their buildings for flood resiliency. The report provides a step-by-step approach to an adaptation project with a range of retrofit solutions for various property types. The report also provides building professionals with a guide to inform architectural and construction decision making. An illustrative retrofit strategy for semi-detached homes, a common residential building type in the Community is shown in Figure X (See page 28 in City Planning's report).

Other topics of education provided at the resource center would include education about changes to FEMA's flood maps, flood insurance requirements, how to obtain flood insurance, and guidance for grants, loans, legal support, and financial planning. Additionally, guidance will be provided on best practices for building retrofits and various physical resiliency measures including installation of backflow preventers in waste water service lines, prevention of basement flooding through flood barriers placed



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on driveways, proper disposal of fats, oil, and grease, the flood mitigating effects of permeable surfaces, and residential green infrastructure practices.

Outreach will be an important part of the education program, as some community members may not be aware that they have insurance and resiliency options. Outreach will be particularly important to reach vulnerable populations in the Communities. Information will be disseminated in multiple languages, with a focus on socially vulnerable populations (e.g., low to moderate income households, those with low English proficiency, the elderly, and the disabled). Program outreach will focus on distributing educational materials as well as making sure that residents and business owners are aware of the services offered.

Technical assistance will come in the form of counseling and on-site building audits performed by case managers. Housing counseling and audits will be available to low and moderate income (LMI) households (as well as potential homebuyers) to assist them with resiliency measures or first time homebuyer assistance. Counseling and audits can also be provided for Community businesses for assistance with business continuity and building retrofits. Specific topics covered may include flood insurance, flood risk, rebuilding and resiliency retrofits, and assistance finding organizations to complete retrofits. Examples of retrofit options to be discussed include building flood-proofing measures, installation of backup power generators, and elevation of mechanics for mid- to high-rise buildings.

A report will be provided to the home or business owner after an audit is performed. Case managers will discuss the report with the home or business owners to make sure that they understand their various options, the specific steps they can take to become more resilient, and potential methods for reducing their flood insurance costs, if any. Recommendations for short-, medium- and long-term actions will be provided.

Cost

Approximately \$250,000



C2: Idlewild Watershed Community Open Space Restoration Fund

Project Description

This project would establish a self-sustaining fund in the model of New York Restoration Project (NYRP), Central Park Conservancy, and other private, not-for-profit open space funds. Seed money will establish the fund, which will provide for supplemental, community-based maintenance and advocacy for parks, open space, and natural resources in the Community. The fund would be administered, with a particular emphasis on stewardship and restoration projects. The primary benefit of the *Idlewild Watershed Community Open Space Restoration Fund* is to ensure that an organization exists to provide critical, ongoing maintenance of the Community's natural stormwater management infrastructure, including Bluebelts, bioswales, ponds, creeks, and wetlands.

Management of the fund would require coordination between a citywide organization with proven capacity and local groups with intimate knowledge of the priorities and needs of the Community. Similar programs are operated by citywide organizations such as the NYRP, City Parks Foundation, and Design Trust for Public Space. *The Idlewild Watershed Community Open Space Restoration Fund* has three key objectives:

1. Ongoing Maintenance

Provide adequate resources for the ongoing maintenance of existing parks for stormwater management and recreation, in particular for Bluebelts, bioswales, and trail networks. It would also provide a mechanism for maintenance of the proposed NYRCR green infrastructure pilot projects, including the *Brookville Park Pond Restoration*, *Twin Pond Park Bluebelt Enhancement*, and *Green Infrastructure Pilot Project (School Green Roof and Raingarden)*.

- Partner with New York City Department of Environmental Protection to ensure functionality of stormwater mitigation measures, including Bluebelts, Bioswales, and Raingardens
- Partner with New York City Department of Parks and Recreation to ensure quality of park space

2. Workforce Training and Volunteer Development

Conduct workforce training and volunteer development and training programs to encourage stewardship of the Community's parks and open space by local residents and businesses. According to the U.S Environmental Protection Agency, as green infrastructure installations become more prevalent across the Country, the demand for related job skills continues to rise. Green jobs training programs would outreach to local youth and unemployed residents in the community to teach them skills related to the initial design and installation of green infrastructure practices, as well as for long term maintenance.^v

3. Advocacy

Serve as an advocate for the Community's natural resources and parklands by identifying additional funding sources and securing City resources to conduct improvements and maintenance to ensure a sustainable network of greenspace.

Cost

\$500,000



Strategy C Advocacy Projects:

C3: Advocate for Idlewild Park Preserve Trail Network and Overlook Restoration

This project would advocate for improved connectivity of the overlook constructed the NYC Department of Environmental Protection (DEP) and NYC Department of Parks and Recreation (DPR) in Idlewild Park Preserve that is presently being restored by creating a network of trails and nature walks within the Park. Idlewild Park has been designated a Forever Wild Preserve, a natural area within New York City that supports diverse wildlife and plant populations, including numerous rare, threatened and endangered species. The goal of this project is to increase awareness of the purpose and function of Idlewild Park Preserve by providing user friendly outdoor activities and educational opportunities for the public to experience and interact with the park.

The first step in this project would be to develop a conceptual plan that considers the location of sensitive areas, scenic overlooks and vistas, contiguous uses, access, connectivity and transportation to both the new Idlewild Park Preserve Environmental Learning Center and the Idlewild Park Preserve overlook. This would include maps and three dimensional renderings that illustrate key features. While the length of trails would be determined by the plan, it is estimated that a trails network of at least two miles would be feasible. Costs to implement the plan will be estimated and itemized, including operations and maintenance costs as well as life cycle costs. Partners will be identified for implementation, which will include blazing the trails, installing interpretive and educational signage, constructing platforms or boardwalks as necessary, and installing new benches in scenic viewing areas. The project would also include funding for necessary permits and species assessment, soil erosion and sediment control measures.

The project would further enhance the natural features and character of the Preserve by guiding hikers along designated routes to avoid environmentally sensitive areas and habitats. It would also provide healthy recreational opportunities by providing uninterrupted pedestrian connectivity to existing trails, in a park that is a valued community asset.

C4: Advocate for Municipal Agency Coordination to Prioritize Resilience

This project would establish a policy position to advocate for City agencies to better coordinate their activities to prioritize resilience. Through the NYC Office of Resilience and Recovery, *PlaNYC*^{vi}, and *A Stronger, More Resilient New York*^{vii}, the Mayor's office has established resilience to extreme weather and the impacts of climate change as critical priorities for the future of the City. While these planning documents provide City agencies a framework for formulating agency-level priorities that are in line with City-wide resilience goals, some local groups in the Idlewild Watershed Communities have been reflective of agency priorities that are not supportive of the critical goal of increasing resilience. In addition, enforcement of laws that are currently on the books, especially with regards to illegal dumping and basement conversions, is often too lenient with the Community.



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The Committee advocates for all City agencies to view resilience to extreme weather and the impacts of climate change as top priorities when planning future program development and capital project planning.

C5: Support for Creation of Greater JFK Industrial Business Improvement District (IBID)

This project would establish a policy position to advocate for the creation of the Proposed Greater JFK IBID with specific recommendations for roles that the JFK IBID could play in increasing resilience. In particular, the Committee advocates that the JFK IBID evaluate strategies to address recurring stormwater flooding within the District boundaries, which impacts both residents and businesses. In addition, the Committee advocates that the JFK IBID contribute to increased enforcement of illegal dumping within the District. Illegal dumping along 150th Road, within the JFK IBID Boundary, has an impact on the health of the wetlands in the Idlewild Park Preserve, which could limit the capacity of the wetlands to absorb stormwater. Further, the JFK IBID could evaluate whether illegal dumping in other parts of the Community result from activities by businesses that are located within the District. Dumping along Springfield Lane and Brookville Boulevard has a negative impact on the health of the wetlands.



D. Strategy D

D3: Study to Elevate Brookville Boulevard (Snake Road) between 149th Boulevard and Rockaway Boulevard

Project Description

Brookville Boulevard—also known as Snake Road—is a key transportation corridor for the Idlewild Watershed Communities linking Brookville with Rockaway Boulevard, one of the Community’s three main east-west thoroughfares. The roadway services 17,500 cars daily, the Q114 bus route, and provides direct access from Brookville to Meadowmere. However, Brookville Boulevard is a dangerous road due to its location, layout, and elevation. The narrow road is only 24 feet wide in most locations, and is situated at an elevation of only 4 feet above sea level as it winds through low-lying wetlands, causing it to flood frequently. Further, it lacks guard rails and standard roadway safety measures.

The roadway washed out from tidal surge during Superstorm Sandy, limiting transportation access to the Community and limiting the Community’s ability to access one of the area’s main retail centers. It continues to wash out regularly during spring tides or storm events. The proposed project would:

- Identify the direct causes of flooding at Brookville Boulevard and 149th Avenue, which is the cross street located at the Brookville entrance to the boulevard.
- Study the feasibility of elevating the entire length of roadway through the Idlewild Park Preserve to address the identified causes of flooding.
- Assess the use of infrastructure upgrades to elevate the roadway on a trestle to encourage the passage of intertidal waters through the surrounding wetlands. The passage of these waters is important for the protection of the wetlands and the function of the wetlands as a water retaining body.
- Include construction of a wetlands boardwalk adjacent to the elevated roadway for pedestrian and bicycle travel. This boardwalk would provide educational opportunities and interpretive signage, with a scenic overlook for public recreation.

The scope of work for this project would include baseline studies such as topographic and geotechnical surveys, environmental site assessments, threatened and endangered species surveys and wetland delineations, as well as a tidal analysis. The report would evaluate the feasibility of several alternatives, and assess the effectiveness of those alternatives for flood mitigation and safety.

Co-benefits of the project included in this study are:

- Improve function and health the wetlands.
- Improve the Community’s ability to access goods and services and jobs in the aftermath of major storm events or during typical spring tides.

Cost

Approximately \$450,000



D6: Install Backup Power Supply Systems at Critical Facilities

Project Description

During Superstorm Sandy, the Community's electrical grid was compromised and failed to give power to facilities that served vulnerable populations, such as the young, elderly, and disabled. Unreliable power or complete power failure at these facilities impeded the use of critical facilities after the storm, which slowed disaster recovery. Ensuring power at critical facilities throughout the Community would benefit the entire community before, during, and after storm events. For example, schools with reliable power will not need to temporarily transfer their students to a separate school; senior centers would not need to evacuate their residents because of a power failure; and functioning traffic lights and street lights would maintain a safe transportation infrastructure.

This project would initiate a competitive process (i.e., a Request for Expressions of Interest) to provide a predetermined amount of funds to install fixed, permanent generators or renewable energy sources—such as solar panels with backup batteries—at critical facilities to provide reliable power during and after major storm events. Recipients will need to match any additional funds that may result from the site preparation necessary to install the power supply. The power supply installed would allow the facility to function during and after storm events when the surrounding power infrastructure fails. Critical facilities that would receive generators may include emergency response facilities, facilities that serve vulnerable populations, facilities whose functions are critical to the Community, and public schools. The critical facility must have an existing, suitable location for the generator. The facility also must not be in the floodplain. Otherwise, recipients may need to match funds for the site preparation surrounding the installation of the generator.

The installation of generators at critical facilities opens up the ability to develop a potential microgrid network. A microgrid network can create a small-scale power network that uses the generator as a power source. The network would be independent from the main power network and would continue to function if the main power network were to fail.

Cost

\$500,000



D5: "Go to High Ground" Pilot Study

Project Description

This project would advocate expansion of the "Go to High Ground" study created by the NYRCR Staten Island Committee, or use the findings of that study as the basis for a study specific to the Idlewild Watershed Communities. The Study would include a wayfinding signage program, study of potential locations for parking, evaluation of the legal and regulatory barriers to such parking agreements, and conceptual design of the 'Go to High Ground' network.

Cost

\$100,000



Strategy D Advocacy Projects:

D2: Elevate 147th Avenue Bridge at Brookville Park

The 147th Avenue bridge crosses over Brookville Park between 232nd St and Brookville Boulevard. South of the Belt Parkway, this bridge is the only transportation corridor that allows access from Rosedale to Laurelton and Springfield Gardens. A traffic report in 2003 estimates the daily traffic count on this bridge to be around 13,000. Despite the importance of the bridge, it possesses several vulnerabilities. The bridge is at a low elevation, making it susceptible to tidal inundation. During Hurricane Sandy, the 147th Avenue bridge was flooded, posing many risks stemming from the lack of a safe transportation route throughout the Community.

The bridge features culverts that allow the passage of water from Conselyeas Pond—located in Brookville Park—into the Idlewild Park Preserve wetlands. As shown in **Error! Reference source not found.**, the culverts are low lying, which do not allow an efficient flow of water. This disruption in water flow may cause Conselyeas Pond and the surrounding area to flood during rain events. In addition, due to its lower elevation and flooding issues, the bridge is getting deteriorated with time. Crash barriers and both the edges of the bridge are deteriorated and substandard.

There is currently a project underway that would reconstruct the streets of a segment of Brookville Boulevard and adjoining streets, which make up an area named the Brookville Edgewood Triangle. The scope of this project includes the reconstruction of the 147th Avenue Bridge described above. The project is currently in the design phase and funded for construction in 2015. This project would support the elevation of the 147th Avenue Bridge and reconstruct the drainage beneath the bridge.

Elevation of the bridge would reduce the occurrences of flooding, increasing hydraulic capacity under the bridge for flood flows and allowing safer access to the bridge for automobiles, bikes and pedestrians. Thus, reconstruction of the bridge is important for the following reasons:

- The flood water conveyance and flow would be improved for the underlying creek.
- The bridge services a high traffic road (~13,000 cars daily).
- The bridge services 2 MTA bus lines.
- Adverse impacts on traffic circulation are avoided; there is a lack of detours if the bridge is flooded.
- Improved public safety for pedestrian and cyclists

D7: Support Rockaway Turnpike/Nassau Expressway Resilient Corridor Study (NYRCR Plan for the Five Towns)

The Idlewild Watershed Communities Planning Committee supports the *Rockaway Turnpike/Nassau Expressway Resilient Corridor Study* which was included as a Proposed Project in the NYRCR Five Towns Plan, with an expanded scope that addresses potential impacts and benefits for the Idlewild Watershed Communities.

The scope of the *Rockaway Turnpike/Nassau Expressway Resilient Corridor Study* was designed to provide regional benefits and extends beyond the Five Towns boundary into the Idlewild Watershed



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Communities. The study was designed to respond to the extent of Superstorm Sandy inundation and the Five Towns Planning Committee recognized that preventing future tidal flooding would require an elevated levee that reached beyond the length of Thurston Basin, adjacent to JFK Airport. Elevating Rockaway Boulevard, which was the solution described in the Five Towns project description, could protect the Idlewild Watershed Communities from future tidal flooding, but would also cause potential unintended consequences within the Community.

The Idlewild Watershed Communities Planning Committee advocates that the *Rockaway Turnpike/Nassau Expressway Resilient Corridor Study* explore strategies to mitigate severe tidal flooding while protecting and enhancing the wetlands in Idlewild Park Preserve that help to reduce stormwater flooding in the Community as well as in adjacent NYRCR Communities, including the Five Towns and South Valley Stream.



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ⁱ City of New York. Department of Transportation. *6.6 Stormwater-Capturing Installations. Street Design Manual*. 2013. <http://www.nyc.gov/html/dot/html/pedestrians/streetdesignmanual.shtml>.

ⁱⁱ City of New York. Department of Environmental Protection. Office of Green Infrastructure. Standards for Green Infrastructure. 29 August 2014. http://www.nyc.gov/html/dep/pdf/green_infrastructure/bioswales-standard-designs.pdf.

ⁱⁱⁱ Sewage Overflows from Hurricane Sandy, Climate Central, April 2013

^{iv} Hudson-Raritan Estuary Comprehensive Restoration Plan – Potential Restoration Opportunities, 2014

^v Managing Wet Weather with Green Infrastructure. Green Jobs Training, A Catalog of Training Opportunities for Green Infrastructure Technologies. 2010. Available at: www.epa.gov/greeninfrastructure.

^{vi} Mayor’s Office of Long Term Planning and Sustainability. *PlaNYC*. 2007. <http://www.nyc.gov/html/planyc/html/about/about.shtml>

^{vii} NYC Special Initiative for Rebuilding and Resiliency. *A Stronger, More Resilient New York*. 2012. <http://www.nyc.gov/html/sirr/html/home/home.shtml>