

BAY PARK/VILLAGE OF EAST ROCKAWAY DRAINAGE IMPROVEMENTS



**Governor's Office of
Storm Recovery**

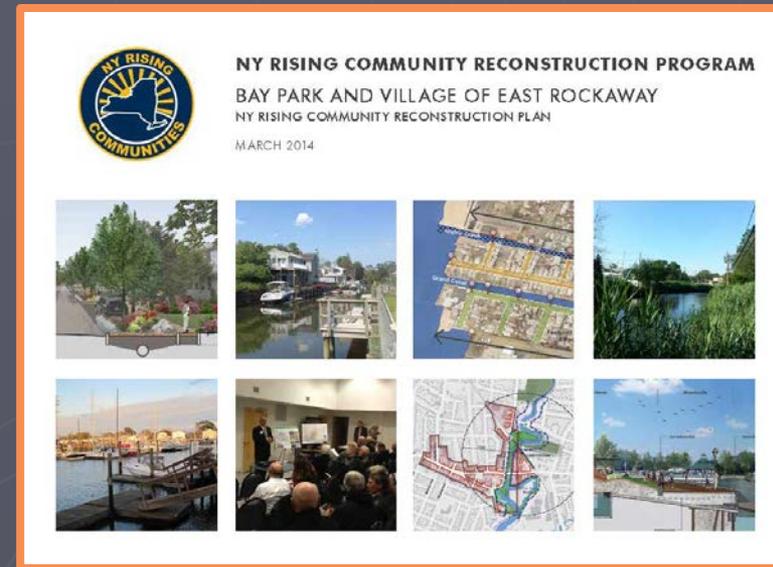
**Nassau County
Governor's Office of Storm Recovery
Nelson & Pope**

MARCH 2017



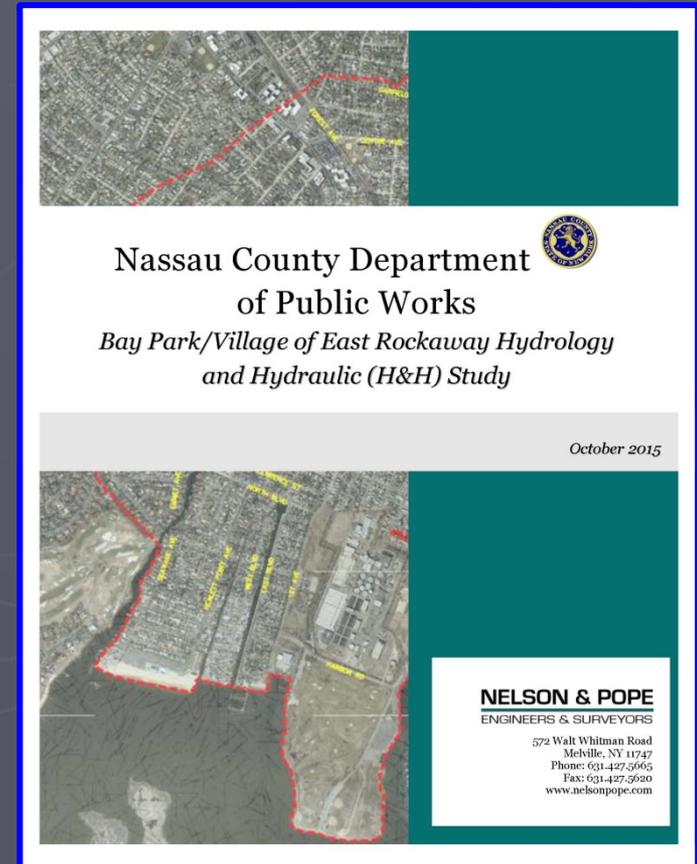
PROJECT BACKGROUND AND OBJECTIVE

- ▶ March, 2014 – GOSR releases the NY Rising Community Reconstruction Program for Bay Park and Village of East Rockaway
- ▶ Nassau County commits to oversee a comprehensive Drainage Improvement Study for the Bay Park/Village of East Rockaway area. The Governor's Office of Storm Recovery (GOSR) releases the Bay Park and East Rockaway Community Reconstruction Plan. This Plan identified the need for a comprehensive drainage study.



PROJECT IMPLEMENTATION

- ▶ In September 2015, Nassau County released a Request for Proposal (RFP) to solicit proposals from qualified engineering firms to conduct a comprehensive drainage study and prepare preliminary design documents.



PROJECT IMPLEMENTATION

Nassau County's Department of Public Works to provide Project Oversight

The Project Team consists of:

- ▶ Nelson & Pope, Engineers & Surveyors
- ▶ The LiRo Group
- ▶ Gayron de Bruin Land Surveying & Engineering (W/DBE)
- ▶ Hirani Engineering & Land Surveying (M/DBE)
- ▶ VJ Associates (M/DBE)

OVERALL STUDY AREA



The Project is comprised of Six Major Tasks:

- 1. Outreach and Project Coordination**
- 2. Data Acquisition**
- 3. Storm Event and Drainage System Analysis**
- 4. Development of Alternatives**
- 5. Preparation of H&H Technical Memo/Final Report**
- 6. Preparation of 30% Design Documents**

TASK 1: OUTREACH AND PROJECT COORDINATION

- **Attend Project Coordination Meetings with County**
 - February 2016 Kick Off Meeting with County and GOSR
 - April 2016 Progress Meeting with County
 - November 2016 Progress Meetings (2) with County
- **Outreach Meetings With County, Town, Governmental Agencies**
 - March 2016 Committee Update with County, GOSR and the Village of East Rockaway
 - May 2016 Committee Update with County, GOSR, Town of Hempstead and the Village of East Rockaway
 - December 2016 Progress Meeting with County, GOSR, Town of Hempstead and the Village of East Rockaway
 - Coordination Meetings with Living with the Bay and GOSR on January 3rd and 24th of this year
- **Focus Group/ Technical Meetings With Municipal Agencies**
 - August 2016 Technical Meeting with County
 - August 2016 Technical Meeting with County and Village of East Rockaway
 - September 2016 Technical Meeting with County and Town of Hempstead

TASK 2: DATA ACQUISITION

- Prepare preliminary drainage plan depicting existing drainage structures, piping, outfalls, recharge basins and other drainage related facilities;
- Obtain State, County, Town and Village Drainage records and pertinent information;
- Interview Personnel regarding system operation and issues;
- Field Inventory of existing drainage facilities within the study area



TASK 3: STORM EVENT AND DRAINAGE ANALYSIS

- Identify the overall drainage tributary area
- Hydrology Method Used: SCD TR-55
- Perform analyses of the existing drainage system for 3 Storm Events:
 - 1-Year Storm (2.84", 24-hour period);
 - 10-Year Storm (5.05", 24-hour period)
 - 100-Year Storm (8.92", 24-hour period)
- Assumed Tidal Event used for Analysis:
 - Highest Annual Tide Cycle for Sandy Hook, NJ
(*information received from NCDPW*)
 - Assumed Coincidental Rainfall and Tidal Events

TASK 3: STORM EVENT AND DRAINAGE ANALYSIS

Inlets

General specifications
 Inlet ID: D-11-51
 Inlet manufacturer: FHWA HEC-22 Generic
 Manufacturer part number: N/A
 Number of inlets: 1
 Inlet type: Combination Inlet
 Inlet location: On Grade
 Combination inlet type: Cub Opening & Grate
 Cub opening and grate type: Equal Length Inlet

Description
 Combination inlet specifications
 Grate type: Rectangular
 Grate length: 50.00 in
 Grate width: 30.00 in
 Cub opening clogging factor: 0
 Cub opening length: 50.00 in
 Cub opening height: 50.00 in

Physical properties
 Catchbasin invert elevation: -0.24 ft
 Inlet elevation: 1.01 ft
 Flooded area:
 Initial water surface elevation: 0 ft
 External inflow: NO
 Grate clogging factor: 0
 Roadway/gutter bypass link:

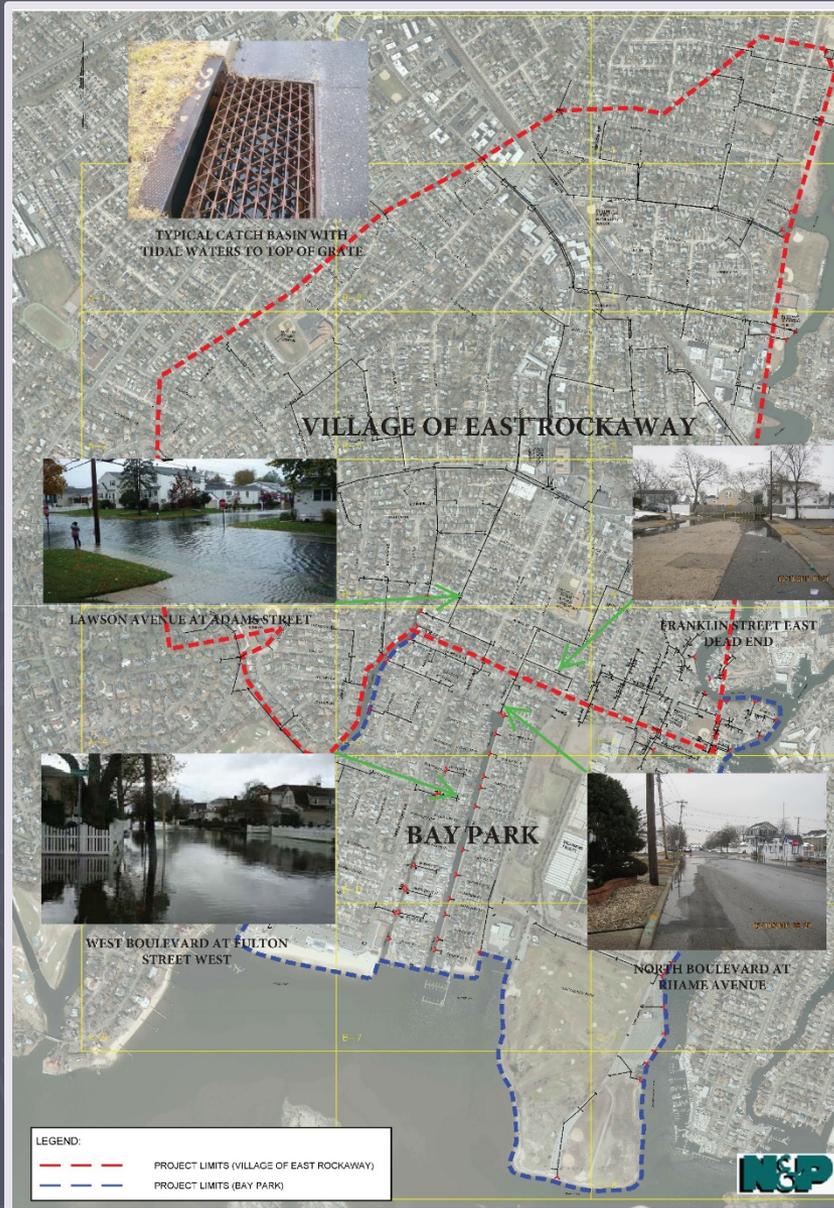
Roadway & gutter specifications
 Roadway longitudinal slope: 0.01 R/W
 Roadway cross slope: 0.02 R/W
 Roadway Manning's: 0.016
 Gutter cross slope: 0.062 R/W
 Gutter width: 2.00 ft
 Gutter depression: 2.00 in
 Upstream roadway links:

Inlet illustration

Analysis summary
 Peak flow during analysis: N/A cfs
 Peak flow intercepted by inlet: N/A cfs
 Peak flow bypassing inlet: N/A cfs
 Inlet efficiency during peak flow: N/A %
 Gutter speed during peak flow: N/A ft
 Gutter flow depth during peak flow: N/A ft

Inlet ID	Inlet Elev.	R/W Elev.	Inlet Manufacturer	Part Number	Inlet Location	Flooded Area	Roadway Long. Slope	Roadway Cross Slope	Gutter Cross	Gutter Width	
19	D-11-51	-0.24	1.01	FHWA HEC-22 Generic	N/A	On Grade	N/A	0.01	0.02	0.062	2.00
20	Inlet-20	0	6	FHWA HEC-22 Generic	N/A	On Grade	N/A	0.01	0.02	0.062	2.00
21	Inlet-21	0	6	FHWA HEC-22 Generic	N/A	On Grade	N/A	0.01	0.02	0.062	2.00
22	Inlet-22	0	6	FHWA HEC-22 Generic	N/A	On Grade	N/A	0.01	0.02	0.062	2.00

TASK 3: STORM EVENT AND DRAINAGE ANALYSIS



- Conduct a site visit during significant storm events to verify the model and operation of existing outfalls and valves

TASK 4: DEVELOPMENT AND ANALYSIS OF ALTERNATIVES

- Prepare and model various potential alternative flood mitigation measures such as:
 - Storage basins
 - End-of and In-Line Pipe Treatments
 - Implementation of green infrastructure pilot projects
 - Increasing Pipe Capacity



TASK 5: PREPARATION OF FINAL DRAINAGE REPORT

The Report includes the following:

- ❖ Description of existing conditions;
- ❖ Summary of modeling and analyses;
- ❖ Identification of deficiencies within the Study area;
- ❖ Conceptual layouts of various strategies and improvements;
- ❖ Develop Preliminary Construction Costs based on the proposed alternatives;
- ❖ Create Matrix comparing improvements, benefits, impacts and costs;
- ❖ Utilize Matrix to identify high-priority project to move into preliminary design;
- ❖ Prepare Recommendations for Implementation and Development;

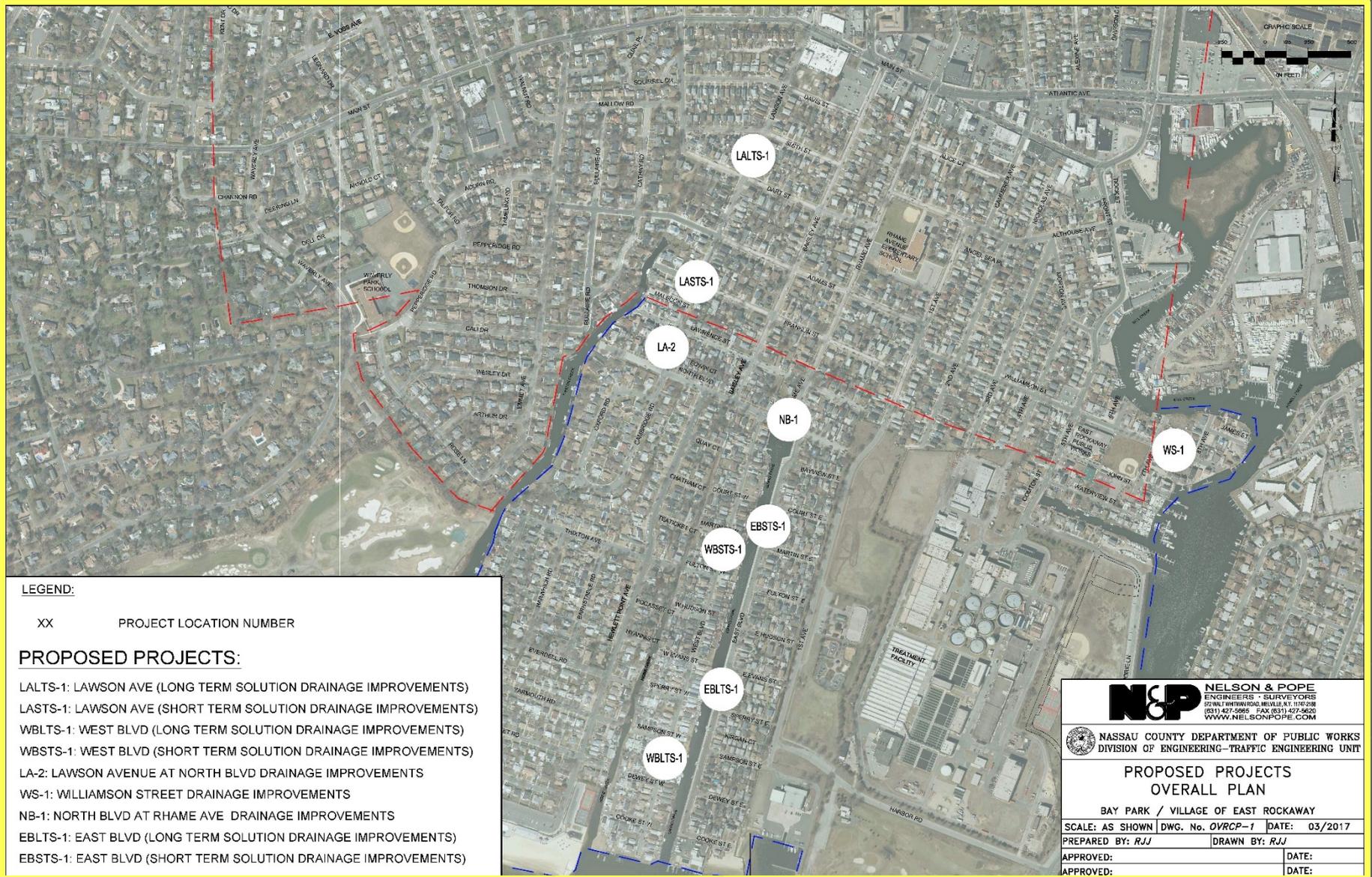
Final Drainage Report Completed December 2016

PROPOSED PROJECT PRIORITY MATRIX

Met with the County, the Town of Hempstead and the Village of East Rockaway in December 2016 to prioritize and select the Recommended Projects to be advanced to 30% Design Documents

COMPREHENSIVE DRAINAGE INFRASTRUCTURE MASTER PLAN FOR BAY PARK AND THE VILLAGE OF EAST ROCKAWAY JANUARY 2017					
		 			
PROPOSED PROJECT PRIORITY MATRIX *Recommended Projects					
PROPOSED PROJECTS:					
LOCATION NUMBER	LOCATION	PROJECT DESCRIPTION	OVERALL ESTIMATED COST	MUNICIPALITY	UNIFORM RELOCATION ACT
LALTS-1	LAWSON AVENUE (LONG TERM SOLUTION)	CONSTRUCT NEW DRAINAGE SYSTEM ON LAWSON AVENUE FROM DAVIS STREET TO FRANKLIN STREET. INSTALL NEW DRAINAGE SYSTEM ON FRANKLIN STREET WITH PRETREATMENT STRUCTURE AND PROPOSED STRUCTURE WITH IN-LINE CHECK VALVE. REPAIR BULKHEAD ON MALECON STREET AND FRANKLIN STREET. MILL AND FILL LAWSON AVENUE, FRANKLIN STREET, MALECON STREET, DAVIS STREET, AND SMITH STREET.	\$3,280,000	THE VILLAGE OF EAST ROCKAWAY	NO
LASTS-1	LAWSON AVENUE (SHORT TERM SOLUTION)	PARTIALLY RECONSTRUCT DRAINAGE SYSTEM ON LAWSON AVENUE FROM ADAMS ST TO FRANKLIN STREET. INSTALL NEW DRAINAGE SYSTEM ON FRANKLIN STREET WITH PRETREATMENT STRUCTURE AND PROPOSED STRUCTURE WITH IN-LINE CHECK VALVE. INSTALL CATCH STRUCTURES AND DRAINAGE PIPE ON DAVIS STREET AND SMITH STREET. REPAIR BULKHEAD ON FRANKLIN STREET. MILL AND FILL LAWSON AVENUE, FRANKLIN STREET, MALECON STREET, DAVIS STREET, AND SMITH STREET.	\$1,630,000	THE VILLAGE OF EAST ROCKAWAY	NO
*MCV-1	CHECK VALVES VARIOUS LOCATIONS <i>(See Priority List for Recommended Check Valves)</i>	INSTALL PRETREATMENT STRUCTURES OR FILTER BAGS IN EXISTING CATCH STRUCTURES. INSTALL AN IN-LINE CHECK VALVE WITHIN A STRUCTURE AT VARIOUS LOCATIONS (31 LOCATIONS. SEE PROPOSED CHECK VALVE PRIORITY LIST). RECONSTRUCT BULKHEADS ON DEWEY STREET W, SAMPSON STREET W, FULTON STREET W, MARTIN STREET W AND WILLIAMSON STREET.	\$4,085,000	BAY PARK AND THE VILLAGE OF EAST ROCKAWAY	NO
WBLS-1	WEST BOULEVARD (LONG TERM SOLUTION)	CONSTRUCT FIVE (5) NEW DRAINAGE SYSTEMS AND RAISE ALL ROADS (6' - INSTALL PRETREATMENT STRUCTURE AND PROPOSED STRUCTURE WITH IN-LINE CHECK VALVE AT FIVE (5) OUTFALLS ON FULTON STREET WEST, SAMPSON STREET WEST AND THREE (3) ON WEST BLVD. ABANDON THE OUTFALLS ON MARTIN STREET WEST, SPERRY STREET WEST AND DEWEY STREET WEST. RECONSTRUCT BULKHEADS AT STREET ENDS (12 EACH AT 40 LF).	\$9,130,000	BAY PARK	YES
WBST-1	WEST BOULEVARD (SHORT TERM SOLUTION)	INSTALL NEW PRETREATMENT STRUCTURES OR FILTER BAGS IN EXISTING CATCH STRUCTURES. INSTALL AN IN-LINE CHECK VALVE WITHIN A NEW MANHOLE AT THE STREET ENDS OF DEWEY STREET WEST, SAMPSON STREET WEST, FULTON STREET WEST, AND MARTIN STREET WEST. RECONSTRUCT BULKHEADS AT ALL STREET ENDS WITH THE EXCEPTION OF SPERRY STREET WEST AND COOKE STREET WEST (6 EA AT 40 LF).	\$2,750,000	BAY PARK	YES
LA-2	LAWSON AVENUE AT NORTH BOULEVARD	CONSTRUCT A NEW DRAINAGE SYSTEM AND INSTALL A PRETREATMENT STRUCTURE AND A PROPOSED STRUCTURE WITH IN-LINE CHECK VALVE. ABANDON ONE (1) EXISTING OUTFALL. REPAIR BULKHEADS ON NORTH BOULEVARD AND LAWRENCE STREET. A PORTION OF LAWSON AVENUE, NORTH BOULEVARD AND LAWRENCE STREET WILL BE MILLED 1.5" AND AN ASPHALT OVERLAY OF 1.5" WILL BE PLACED.	\$1,930,000	BAY PARK	NO
WS-1	WILLIAMSON STREET	CONSTRUCT TWO (2) NEW DRAINAGE SYSTEMS AND INSTALL PRETREATMENT STRUCTURES AND PROPOSED STRUCTURES WITH IN-LINE CHECK VALVES. ABANDON THREE (3) EXISTING OUTFALLS. RECONSTRUCT THE BULKHEAD ON WILLIAMSON STREET AND REPAIR BULKHEADS ON 8TH AVENUE, 7TH AVENUE, 8TH AVENUE AND JAMES STREET. A PORTION OF WILLIAMSON STREET, JAMES STREET, 6TH, 7TH AND 8TH AVENUE WILL BE MILLED 1.5" AND AN ASPHALT OVERLAY OF 1.5" WILL BE PLACED.	\$2,690,000	BAY PARK AND THE VILLAGE OF EAST ROCKAWAY	YES
NB-1	NORTH BOULEVARD AT RHAME AVENUE	INSTALL A PRETREATMENT STRUCTURE AND AN IN-LINE CHECK VALVE	\$224,000	BAY PARK	NO
EBLTS-1	EAST BOULEVARD (LONG TERM SOLUTION)	CONSTRUCT FOUR (4) NEW DRAINAGE SYSTEMS AND INSTALL PRETREATMENT STRUCTURES AND PROPOSED STRUCTURE WITH IN-LINE CHECK VALVES. ABANDON TEN (10) EXISTING OUTFALLS. EAST BOULEVARD WILL BE MILLED 1.5" AND AN ASPHALT OVERLAY OF 1.5" WILL BE PLACED.	\$2,150,000	BAY PARK	NO
EBST-1	EAST BOULEVARD (SHORT TERM SOLUTION)	INSTALL FILTER BAGS IN EXISTING CATCH STRUCTURES. INSTALL IN-LINE CHECK VALVES AT ALL EXISTING OUTFALLS OF EAST BOULEVARD TO GRAND CANAL (12 LOCATIONS).	\$114,000	BAY PARK	NO
PROPOSED PROJECT TO BE CONSIDERED WITH OTHER FUNDING SOURCES:					
LOCATION NUMBER	LOCATION	PROJECT DESCRIPTION	OVERALL ESTIMATED COST	MUNICIPALITY	UNIFORM RECOVERY ACT
BRA-1	VARIOUS LOCATIONS	INSTALL VEGETATED BIO-RETENTION AREAS AND LEACHING FIELDS AT VARIOUS LOCATIONS (11 EACH AT 30 FEET BY 20 FEET AT STREET ENDS).	\$680,000	BAY PARK AND THE VILLAGE OF EAST ROCKAWAY	NO
LF-1	VILLAGE OWNED PARKING AREAS	INSTALL 20 LEACHING STRUCTURES TO HOLD TIDAL WATER IN VILLAGE OWNED PARKING AREAS NORTH AND SOUTH OF ATLANTIC AVENUE	\$310,000	THE VILLAGE OF EAST ROCKAWAY	NO
BHR-1	VARIOUS LOCATIONS	INSTALL NEW VINYL BULKHEAD AT EAST ROCKAWAY HIGH SCHOOL AND REPLACE BULKHEAD AT VARIOUS LOCATIONS (1 500 FEET FOR THE HIGH SCHOOL AND 28 LOCATIONS AT 40 FT BY 15 FEET).	\$25,400,000	BAY PARK AND THE VILLAGE OF EAST ROCKAWAY	YES

PROPOSED PROJECTS



LEGEND:

XX PROJECT LOCATION NUMBER

PROPOSED PROJECTS:

- LALTS-1: LAWSON AVE (LONG TERM SOLUTION DRAINAGE IMPROVEMENTS)
- LASTS-1: LAWSON AVE (SHORT TERM SOLUTION DRAINAGE IMPROVEMENTS)
- WBLTS-1: WEST BLVD (LONG TERM SOLUTION DRAINAGE IMPROVEMENTS)
- WBSTS-1: WEST BLVD (SHORT TERM SOLUTION DRAINAGE IMPROVEMENTS)
- LA-2: LAWSON AVENUE AT NORTH BLVD DRAINAGE IMPROVEMENTS
- WS-1: WILLIAMSON STREET DRAINAGE IMPROVEMENTS
- NB-1: NORTH BLVD AT RHAME AVE DRAINAGE IMPROVEMENTS
- EBLTS-1: EAST BLVD (LONG TERM SOLUTION DRAINAGE IMPROVEMENTS)
- EBSTS-1: EAST BLVD (SHORT TERM SOLUTION DRAINAGE IMPROVEMENTS)

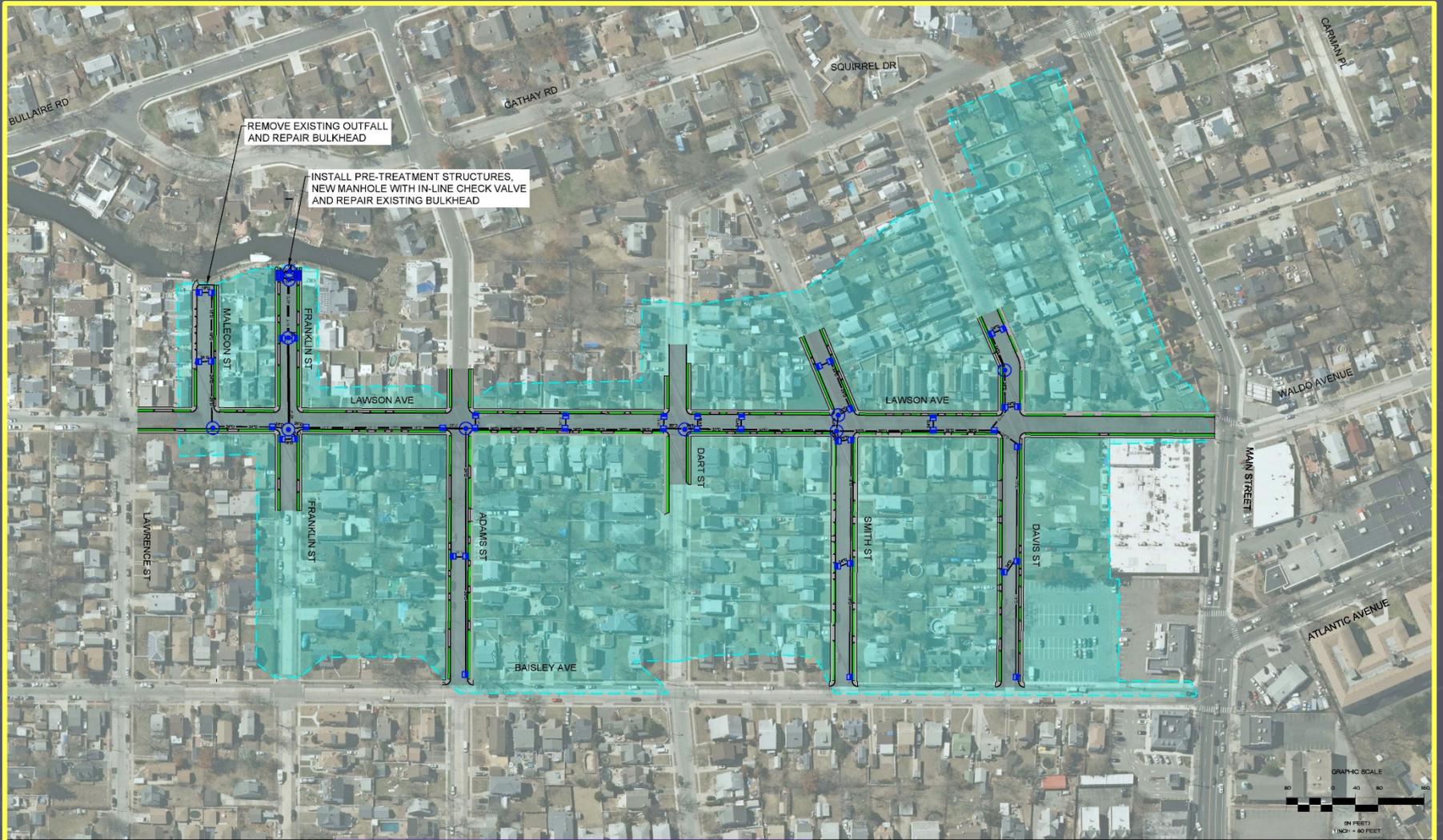
 NELSON & POPE ENGINEERS & SURVEYORS 270 N. FORT MEADE BLVD., SUITE 200 (813) 427-5095 FAX (813) 427-5620 WWW.NELSONPOPE.COM		
		 NASSAU COUNTY DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING-TRAFFIC ENGINEERING UNIT
PROPOSED PROJECTS OVERALL PLAN		
BAY PARK / VILLAGE OF EAST ROCKAWAY		
SCALE: AS SHOWN	DWG. No. OVRCP-1	DATE: 03/2017
PREPARED BY: RJJ	DRAWN BY: RJJ	
APPROVED:		DATE:
APPROVED:		DATE:

TASK 6: PREPARATION OF 30% DESIGN DOCUMENTS

❖ Selected Projects:

- Lawson Avenue Long Term Solution
 - Multiple Check Valves Installation on Lawrence Street and North Boulevard; North Boulevard at Rhame Avenue; West Boulevard; and East Boulevard
- ❖ 30% Plans, Specifications and Estimates for the selected projects are being developed and will be given to Nassau County upon completion (expected April 2017). To be further developed into Construction Documents under succeeding RFP

LAWSON AVENUE LONG TERM SOLUTION



LEGEND:	
	PROPOSED MANHOLE
	PROPOSED CATCH BASIN
	OUTFALL TO BE ABANDONED
	PROPOSED PRE-TREATMENT STRUCTURE
	PROPOSED MANHOLE WITH CHECK VALVE
	VORTEX 16000
	PROPOSED DRAINAGE PIPE
	ROADWAY MILLED AND RESURFACED
	CONTRIBUTING WATERSHED

THE CONSULTANT SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED TO THE CLIENT. THE CLIENT SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED TO THE CONSULTANT. THE CONSULTANT SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED TO THE CLIENT BY THE CLIENT'S OTHER CONSULTANTS OR SUBCONSULTANTS. THE CONSULTANT SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED TO THE CLIENT BY THE CLIENT'S OTHER CONSULTANTS OR SUBCONSULTANTS.

NASSAU COUNTY
DEPARTMENT OF PUBLIC WORKS

CONSULTANT
N&P NELSON & POPE
ENGINEERING & SURVEYING
100 WEST PALM BEACH BLVD. SUITE 100
WEST PALM BEACH, FL 33411
WWW.NELSON-POPE.COM

DIRECTION:

SCALE: 1" = 80'

DRAWING TITLE:
**CONCEPTUAL PLAN
LAWSON AVENUE
DRAINAGE IMPROVEMENTS
BAY PARK - VILLAGE OF EAST ROCKAWAY**

DRAWING NUMBER:
CP-1

SHEET 101 OF 101

MULTIPLE CHECK VALVE INSTALLATION



LEGEND:

- EXISTING OUTFALL
- CHECK VALVES TO BE INSTALLED UNDER LIVING WITH THE SAV PROJECT
- OUTFALL WITH CHECK VALVE AND NEW BULKHEAD INCLUDED IN LAWSON AVENUE PROJECT
- RECOMMENDED CHECK VALVES IN THIS PROJECT
- OUTFALL W/ CHECK VALVE AND NEW BULKHEAD CURRENTLY UNDER CONSTRUCTION
- OUTFALL TO BE REMOVED AND BULKHEAD REPAIRED IN LAWSON AVENUE PROJECT

The Designer is the sole responsible party for the design and construction of the project. The Designer shall be responsible for the design and construction of the project. The Designer shall be responsible for the design and construction of the project.

NASSAU COUNTY
DEPARTMENT OF PUBLIC WORKS

CONSULTANT:
NELSON & POPE
ENGINEERS - SURVEYORS
1000 W. BAYVIEW BLVD., SUITE 200
EAST ROCKAWAY, NJ 07828
WWW.NELSONANDPOPE.COM

DRAWING TITLE: **MISCELLANEOUS CHECK-VALVE LOCATIONS**

DRAWING NUMBER: **MCV-1**

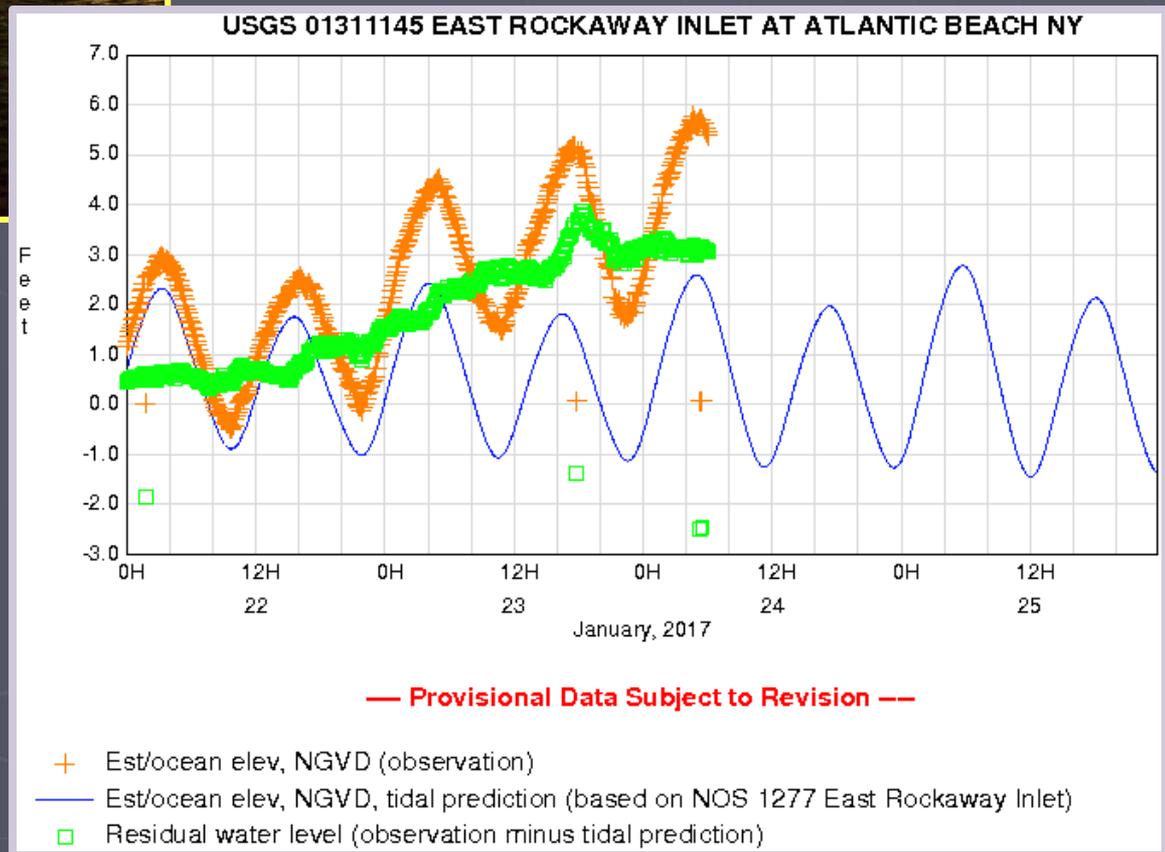
SCALE: 1"=50'

DATE: 1/20/20

OBSERVED FIELD CONDITIONS



East Boulevard at Sampson Street
January 24, 2017



TASKS COMPLETED TO DATE:

- ✓ Reviewed and gathered Record Plans from State, County, Town and Village
- ✓ Prepared Overall Study Aerial depicting all Record Plan Drainage Structures as well as GIS Information
- ✓ Completed Drainage Field Inventory
- ✓ Analysis of the Existing Drainage Systems Completed
- ✓ Developed Solutions, Alternatives and Recommended Projects
- ✓ Final Drainage Report Completed December 2016
- ✓ Selected Projects to be progressed to 30% Preliminary Plans
- ✓ Commenced work on 30% Preliminary Plans for Selected Projects

NEXT STEPS:

- ❑ Continue Development of 30% Preliminary Plans and Estimate for Selected Projects (expected completion April 2017).
- ❑ Provide Nassau County with Completed 30% Preliminary Plans, Specifications & Estimate for Selected Projects

QUESTIONS & ANSWERS

THIS PROJECT WAS FUNDED BY AND CONCEIVED THROUGH THE NY RISING COMMUNITY RECONSTRUCTION PROGRAM OF THE GOVERNOR'S OFFICE OF STORM RECOVERY.

FOR MORE INFORMATION CONTACT SEAN SALLIE, PLANNING DIVISION, NASSAU COUNTY DEPARTMENT OF PUBLIC WORKS, 1194 PROSPECT AVENUE, WESTBURY, NY 11590.

EMAIL: [SSALLIE@NASSAUCOUNTYNY.GOV](mailto:ssallie@nassaucountyny.gov)

Addendum (slides inserted after 3/30/17 public meeting)

- The previous slides, presented on 3/30/17, summarize the study process, findings and selected projects (within available CDBG-DR funding allocation).
- The New York Rising Bay Park/Village of East Rockaway Community Reconstruction Plan (March, 2014) recommended the preparation of a study and several specific drainage improvement projects.
- Excerpts from the Community Reconstruction Plan, pertaining to drainage recommendations, are called out in the following slides.

B1 - East Rockaway - Bay Park Drainage Improvements [Sub-Projects 1-4: Proposed Projects, Sub-Projects 5-6: Featured Projects]

Project Description: During Superstorm Sandy, the stormwater system within East Rockaway and Bay Park backed up with runoff and storm surge inundation as result of the lack of drainage into the canals and creeks and the lack of back-flow valves on the outfalls. The mixture of stormwater drainage flooding and surge flooding makes it difficult to assess whether the flooding resulted from water back up in the storm drains or overtopping of lower elevations. Rainfall was not significant with Superstorm Sandy, which would have compounded flooding effects. Some roads such as Lawson Avenue, North Boulevard, East Boulevard and West Boulevard experience recurring flooding approximately twice a month (on spring tide and moon tides). These corridors serve as “lifeline” routes that connect the communities to emergency services locations and critical facilities, and allow residents to evacuate to higher ground during storm events. As described earlier, the continual flooding has had many negative impacts to the delivery of municipal services, private property, safety, and quality of life throughout the community.

The existing drainage infrastructure is not operating properly for a number of reasons:

- The drainage outfalls are located below the high tide elevation, which causes tidal waters to enter the drainage system through unprotected outfalls and overflow into the streets;
- The outfalls are not equipped with backflow valves/gates;
- Storm drains are often blocked with debris

- and sediment and require very frequent maintenance;
- The system is gravity driven and does not have enough potential energy to convey the flows to the outfalls, therefore the water gets to Lawson Avenue and it stays there; and,
- Despite cleaning of manholes, the system itself has so much siltation that it is functioning at 20-30% of its intended capacity. The capacity of the current drainage system may not meet current regional development demands, which warrant further study.

Although these are all likely to be contributing factors to the drainage infrastructure, limited available information about the existing stormwater infrastructure (i.e. maintenance of the pipes, sedimentation of the pipes, creeks and outfalls) requires that a hydrology and hydraulic (H & H) systems study be conducted first to assess the existing infrastructure – in order to determine the best interventions to undertake. The H & H study, identified as Sub-Project 1 below, would result in workable plans to fix drainage issues in Bay Park and East Rockaway.

Sub-Projects 2 through 6 are developed based on current available data and known stormwater issues along Lawson Avenue, West Boulevard and Higbie Creek, and East Boulevard. These projects were identified by the Village and the Town as preferred interventions to address the drainage issues. However, while project scope and costs were developed for these Sub-Projects, the results of the Sub-Project 1 H & H Study may recommend

other solutions/options to stormwater issues in these areas, resulting in alternative Sub-Projects 2 through 6. Furthermore, Sub-Projects 2 through 6 have been developed to resolve the stormwater management issues along these ‘lifeline’ corridors, and as such would proceed according to the recommendations developed in Sub-Project 1.

Sub-Project 1: East Rockaway/Bay Park Hydrology and Hydraulic Study (Proposed)

This project would study the hydrologic and hydraulic (H&H) systems affecting the Village of East Rockaway and Bay Park. The objective is to gain a watershed-level understanding of the hydrology and hydraulics affecting this area within the community and provide feasible alternatives to address the storm water inadequacies, which would better inform storm water management projects.

A hydrologic and hydraulic study of the watershed would be undertaken to determine where the runoff is coming from, how much, where is it going, and whether the current system is adequate to handle current and future conditions. The total cost of the study is estimated to be \$250,000, which includes four parts:

- An existing conditions analysis with visual inspections of the stormwater catch basins, pipes, outfalls and related infrastructure, stormwater pipe and outfall flow monitoring and updates of the existing stormwater infrastructure system mapping;
- A watershed analysis that compiles

Bay Park and Village of East Rockaway

available GIS data, delineates drainage basins and defines drainage parameters;

- Development and calibration of a “future-conditions” model that includes long-term precipitation and tidal elevation datasets, evaluates historic and future synthetic design events, and simulates typical-year precipitation, accounting for projected land use, precipitation and sea-level rise changes; and,
- Conduct and analysis of alternatives that evaluates model results to identify existing system deficiencies, and develops stormwater and tidal-flow management alternatives to address those deficiencies. Alternative scenarios would be simulated within current and future-condition models, and results would be evaluated in conjunction with a cost-benefit analysis. The project would identify measures that would be needed to ensure adequate stormwater management/capture such as storage basins, the use of green infrastructure and pipe capacity increase.

Sub-Project 2: Lawson Avenue Drainage Improvements - Part 1 (Proposed)

To address the known condition of tidal water entering the stormwater system and flooding the adjacent street, this project would install a total of five (5) check valves at the outfall that drain from Lawson Avenue into Thixton Creek. The valves would prevent tidal waters from entering the system but allow for storm water flow to exit the system during low tides.

The total cost of the project is estimated to be \$120,000 which includes Installation of check valves on outfalls and Site Restoration - bulkheads, etc., Environmental Analysis (NEPA, ESA, Mitigation, etc.), and Regulatory Approvals/Permits Requirements. Project costs incorporate operating and maintenance costs, escalation, construction administration, contract management, as well as contingencies for project design and construction management.

Sub-Project 3: Lawson Avenue Drainage Improvements - Part 2 (Proposed)

This project includes the raising of Lawson Avenue to an elevation of eight feet to address the gravity drainage issues underneath. During Superstorm Sandy and Hurricane Irene, and currently during moon tides or minor rain events, Lawson Avenue experiences localized flooding. The Hydrologic and Hydraulic (H&H) analysis in Sub-Project 1 would help determine the actual rainfall/runoff that would need to be captured within this area. Due to the groundwater elevations, groundwater recharge is not a viable option. The total cost of the project is estimated to be \$2,670,000 which includes surveying, excavation and disposal, new pipe to outfall, site restoration - pavement, sidewalks, etc., re-paving, traffic control and flagging. Project costs incorporate operating and maintenance costs, escalation, construction administration, contract management, as well as contingencies for project design and construction management.

A potential section profile for this road raising is shown in Figure 28. Existing drainage issues and proposed improvements are also shown in Figures 29 & 30.

Sub-Project 4: West Boulevard/Higbie Creek Drainage Improvements - Part 1 (Proposed)

To address the known condition of tidal water from the Higbie Creek entering the stormwater system and flooding the adjacent streets, this project would install a total of three (3) check valves at the outfall that drain from West Boulevard into Higbie Creek. The valves would prevent tidal waters from entering the system but allow for stormwater flow to exit the system during low tides. The project would also address invasive species within the creek and excess sedimentation. Invasive species would be removed and excess sedimentation would be dredged. The Creek would then be re-graded and planted with native wetland species. The dredging of the excess sediment would allow for stormwater flow to exit the system.

This project would also raise the section of the roadway on West Boulevard between North Boulevard and Hudson Avenue to alleviate stormwater drainage issues and recurring localized flooding. The low elevation of segments of these roadways makes them susceptible to varying levels of tidal flooding from the adjacent Higbie Creek. Such tidal flooding occurs on a monthly basis along with significant flooding when major rainstorms coincide with a high tide period, resulting in roadway closures. In addition to the costs to the municipality caused by the necessary reaction to these events, there is a disruption in sanitary curbside garbage collection, interruption of mail services, and, school bus route changes. A general loss of productivity and enjoyment by the residents is experienced when one has to plan departing and returning to home around the tide schedule but there is also the threat of safety especially to the elderly and handicapped population of the area who may need access to

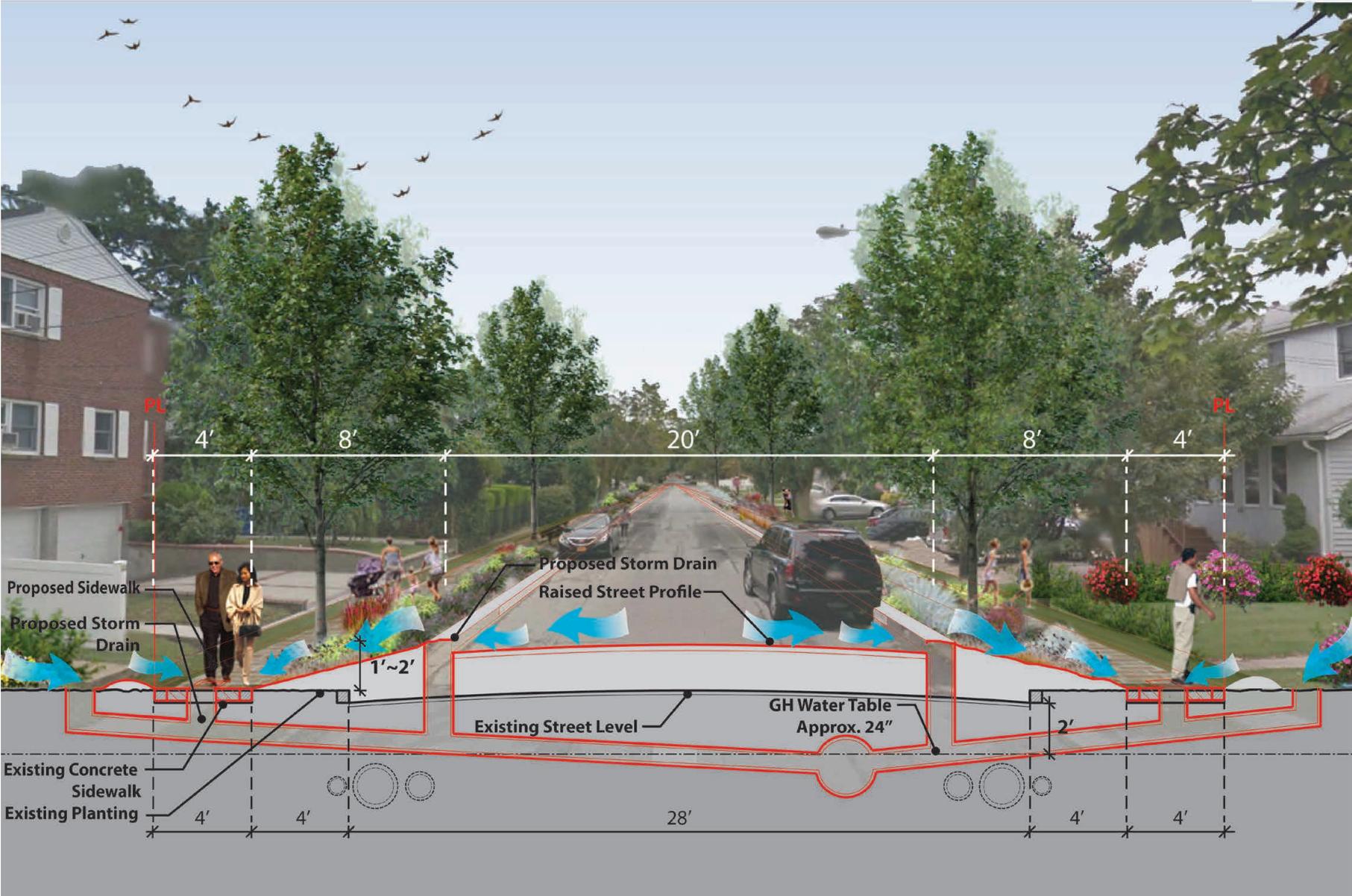


Figure 28: Potential section profile for Lawson Avenue road raising

Bay Park and Village of East Rockaway



Figure 29: Existing drainage issues at Lawson Avenue



Figure 30: Proposed drainage improvements at Lawson Avenue

doctors, hospitals and or pharmacies. The tidal flooding has often caused damage to vehicles parked and/or driven through the salt water that is flooding the roadway. Residents also experience damage to private property including but not limited to their lawns and landscaping. The continual flooding has directly affected the quality of life throughout the community and property values have suffered.²⁸

The total cost of the project is estimated to be \$4,600,000 which includes the installation of check valves on outfalls, dredging, wetland creation and Site Restoration - bulkheads, surveying, excavation and disposal, repaving roadways, traffic control and flagging. Environmental Analysis (NEPA, ESA, Mitigation, etc.), and Regulatory Approvals/Permits Requirements. Project costs incorporate operating and maintenance costs, escalation, construction

administration, contract management, as well as contingencies for project design and construction management.

Sub-Project 5: West Boulevard/Higbie Creek Drainage Improvements - Part 2 (Featured)

This project addresses drainage issues from Higbie Creek tidal water entering the stormwater system and flooding the adjacent streets (see Figure 31 & 32). Check valves would be installed at five (5) outfalls that drain from West Boulevard into Higbie Creek. The valves would prevent tidal waters from entering the system but allow for storm water flow to exit the system during low tides. The project would also address excess sedimentation accumulating within the creek and would be dredged. The dredging of the excess sediment would allow for stormwater flow to exit the system.

This project would also raise the section of the roadway on West Boulevard between Hudson Avenue and Hewlett Bay to alleviate stormwater drainage issues and recurring localized flooding.

The total cost of the project is estimated to be \$5,500,000, which includes the installation of check valves on outfalls, dredging, wetland creation and site restoration - bulkheads, etc., surveying, excavation and disposal, repaving roadways, traffic control and flagging, environmental analysis (NEPA, ESA, mitigation, etc.), and regulatory approvals/permits requirements. Project costs incorporate operating and maintenance costs, escalation, construction administration, contract management, as well as contingencies for project design and construction management.

Sub-Project 6: East Boulevard/Connecting Streets Drainage Improvements (Featured)

This project would build upon Sub-Projects 4 and 5 to raise additional roadways in Bay Park, including East Boulevard, surrounding streets and connecting streets to West Boulevard. The total cost of the project is estimated to be \$4,800,000, which includes surveying, excavation and disposal, new pipe to outfall, Site Restoration - pavement, sidewalks, repaving, traffic control and flagging. Project costs incorporate operating and maintenance costs, escalation, construction administration, contract management, as well as contingencies for project design and construction management.

Cost:

- Sub-Project 1: Low (approximately \$250,000)
- Sub-Project 2: Low (approximately \$120,000)
- Sub-Project 3: High (approximately \$2,670,000)
- Sub-Project 4: High (approximately \$4,200,000)
- Sub-Project 5: High (approximately \$5,200,000)
- Sub-Project 6: High (approximately \$3,900,000)

Benefits: Local, Public

Economic Benefits: Sub-project 1 of this project could create an estimated 3 full-time equivalent jobs, while sub-projects 2-6 could create approximately 1, 29, 50, 60, and 52 jobs, respectively, for a cumulative total of approximately 192 full-time equivalent jobs.²⁷ These figures are tentative, as sub-projects 2-6 could change given the results of the sub-project 1 H&H Study. Additional job creation for maintenance of the new system improvements depends on the type of improvements being installed. Other economic benefits come from additional skills required



Figure 31: Existing drainage issues at East & West Boulevards

Photo source: Bing Maps

from workers to complete the improvements. Since significant portions of the improvements involve “green” techniques, many workers in the field would require new skill sets that often incorporate different approaches to drainage systems and soft infrastructure systems. A more skilled workforce can become more productive and also command a higher price for their work.

Environmental Benefits: The proposed stormwater infrastructure system improvements include increasing capacity and incorporation of green infrastructure measures, which would help to secure all environmental assets in the Community. Environmental assets that would be secured include upland resources such as Kevin

E. McNulty Park, Minore Park, Hewlett Point Park, Bay Park and White Cannon Point Park. The latter phases of the project would focus on the Lawson Avenue area, and include raising the elevation of Lawson Avenue to address the gravity drainage issues underneath, and incorporating green infrastructure to increase the infiltration and capture of stormwater and reduce the peak flow volumes of stormwater. The Lawson Avenue area improvements infrastructure would have beneficial effects to the water quality and aquatic habitat of Thixton Creek, helping to secure this environmental asset. The green infrastructure measures in particular would help to protect the creek from polluted runoff, prevent water quality degradation and restore water quality.

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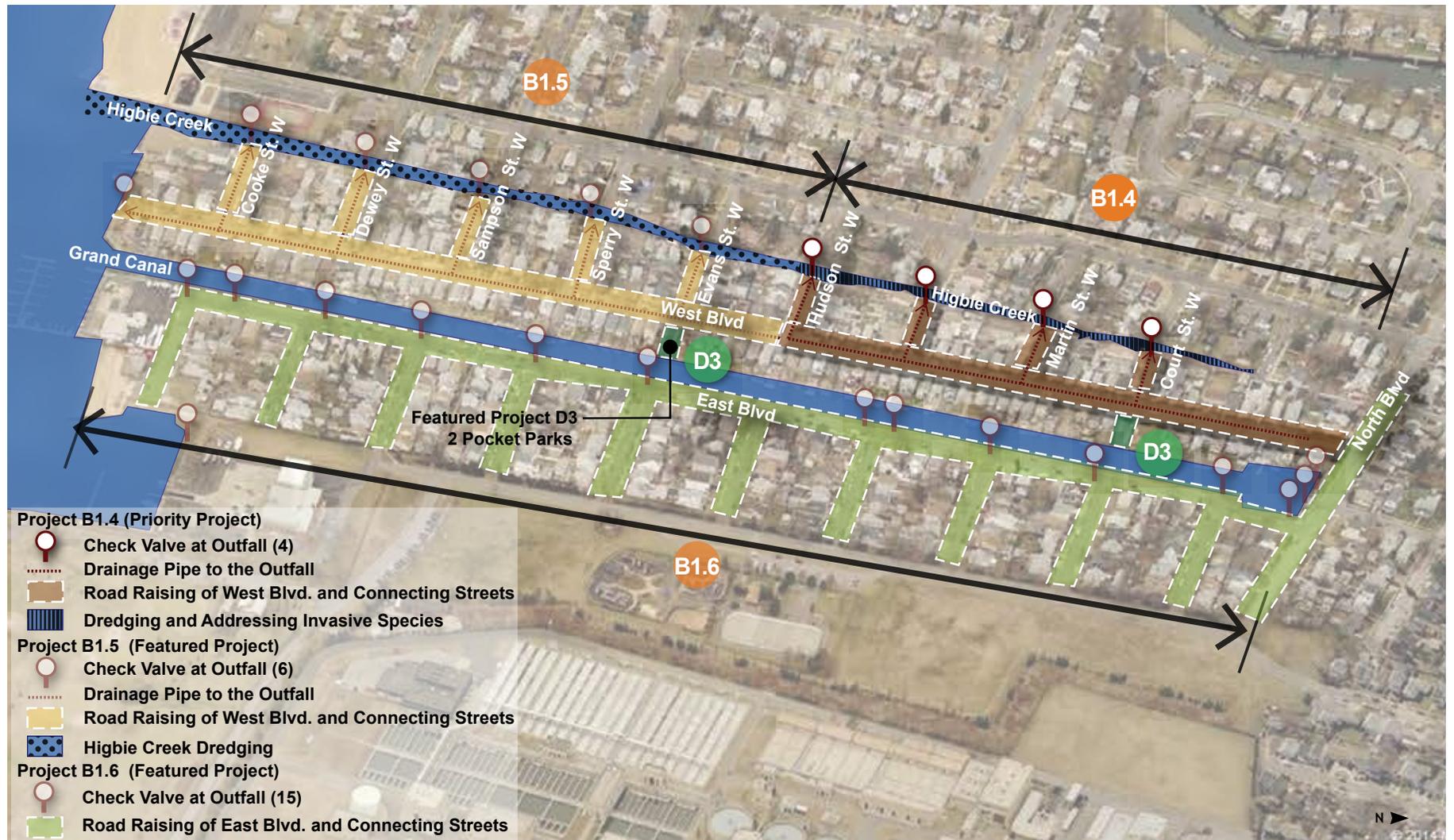


Figure 32: Projects addressing drainage issues at East Blvd., West Blvd., and Higbie Creek

Photo source: Bing Maps



Higbie Creek

The NYSDEC has identified three types of significant natural communities along portions of the western shore of Thixton Creek and along portions of the Bay Park shoreline: Low salt marsh at West Hempstead Bay Wetlands, High salt marsh at West Hempstead Bay Wetlands, and Salt panne at West Hempstead Bay Wetlands.²⁹ These significant natural communities would also benefit from the Proposed Project.

The proposed stormwater management measures in Higbie Creek include natural stormwater infiltration and wetlands restoration, which would benefit and secure Higbie Creek. The project design would minimize impacts to threatened and endangered reed grass species, if any present in the Creek and would incorporate any necessary mitigation. By converting habitat dominated by invasive species to habitat with native wetland plant species, the project would increase the overall ecological uplift of the area. The project would have an overall beneficial effect on the water quality and aquatic habitat of Higbie Creek as well as Hewlett Bay and the greater Hempstead Bays, including habitat that



Higbie Creek

may support threatened and endangered wildlife species. As the Proposed Project would increase the resiliency of the Higbie Creek area in general, it would also protect additional environmental assets in the immediate vicinity such as Hewlett Point Park.

An unidentified threatened or endangered species of reed grass occupies portions of Higbie Creek. The project would require work in the creek that would displace some of the reed population. As such, the project would require the appropriate approval from NYSDEC and would likely include development and implementation of mitigation measures for the reed grass. A possible location for the mitigation site is the upper reaches of the creek. The project would include the identification of alternative or additional mitigation sites, if necessary.

Sub-projects 4, 5 and 6 would raise the elevation of West Boulevard and East Boulevard. Protected environmental and cultural assets include the Bay Park Playground and the open space surrounding the playground.

Health and Social Benefits: The Proposed Project impacts the a total population of 3,451. This project does not secure a specific health and social services facility, but instead aims to protect all health and social services assets by improving stormwater management within the East Rockaway/Bay Park Community, especially in the vicinity of Lawson Avenue in East Rockaway and East and West Boulevards in Bay Park. The project may provide health and social benefits by filtering stormwater runoff from impervious surfaces using green infrastructure, and improving water quality for the Community.

Cost Benefits: Stormwater drainage issues were identified as important to the NYRCR Committee, Community and Village of East Rockaway due to routine localized flooding following Superstorm Sandy. This phased approach to resolving critical stormwater drainage issues, at a cost of \$7,640,000 for four proposed sub-projects and \$9,400,000 for two featured sub-projects, would provide a comprehensive flood mitigation strategy that would improve access along three key roadways, avoid costs of damaged property and reduce government expenditures for emergency response, while improving the environmental quality of Higbie Creek.

Risk Reduction: Assets in Bay Park and East Rockaway are susceptible to flooding because of poor drainage of precipitation through the stormwater sewer system, inundation by seawater back flowing through the stormwater sewer system, and the generally low elevations in portions of the communities. These projects would reduce the vulnerability of assets along Lawson Avenue, East Boulevard and West Boulevard by addressing these problems and thus reducing

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the frequency and severity of flooding during precipitation events and spring tides. Assets that provide a service would therefore experience fewer and/or shorter periods when service is unavailable.

Sub-project 1 would provide feasible alternatives to address the stormwater inadequacies and prevent flood in the area by upgrading pipe capacity, preventing backflow, and ensuring adequate stormwater management. The study would also identify the implementation of Green Infrastructure practices.

Sub-project 2, and portions of Phase 4 and 5 and the Implementation of Sub-project 1 recommendations, aims to prevent backflow of the drainage system, so water can flow in the discharge direction only, improving drainage capacity and helps to prevent or minimize flood damage.

By raising the roadway elevations in Sub-projects 3, 4, 5 and 6, rain water would take longer to raise above road level and rain intensity has to be higher to be a hazard; by upgrading the drainage pipe capacity, water would be discharged faster and minimize the time that water stands above road level. After the implementation of these projects the community would benefit from avoiding walking or driving in a flooded road, and emergency vehicles provide better service to the community.

Sub-project 1 of this project would benefit the entire population of the East Rockaway/Bay Park community, approximately 11,973. As Lawson Avenue is a key access corridor in the Village of East Rockaway, and East and West Boulevards are key access corridors in Bay Park,

Sub-projects 2 – 6 would indirectly benefit the entire East Rockaway/Bay Park community. Sub-projects 2 and 3 would have direct benefits on the population of approximately 449 living along Lawson Avenue. Phases 4 and Phase 5 would have a direct benefit on the population living along West Boulevard, approximately 194, while Sub-project 6 would have direct benefit on the population living along East Boulevard, approximately 512. Specific characteristics of the population are described below in the health and social benefits subsection.

Timeframe for Implementation:

Sub-Project 1: Immediate (< 2 years)
Sub-Project 2: Immediate (< 2 years)
Sub-Project 3: Intermediate (2-5 years)
Sub-Project 4: Intermediate (2-5 years)
Sub-Project 5: Intermediate (2-5 years)
Sub-Project 6: Intermediate (2-5 years)

Regulatory Requirements: All 6 Sub-Projects that fall under this East Rockaway – Bay Park Drainage Improvements project are likely feasible and build upon one another for complete storm water drainage solutions. Sub-Project 1 aims at looking at a watershed approach to determine the deficiencies, if any, in the existing system within East Rockaway and Bay Park. Sub-Project 2 implements an immediate solution to the tidal water entering the storm water system and preventing nuisance flooding. Sub-Project 3 would require a wholesale coordination with owners of private property fronting Lawson Avenue and would require approvals and easements from property owners.

Coordination with the Town and Village would be required, as well as DEC given that changes

to drainage, hydrology and stormwater would occur. Necessary regulatory permits may include Nassau County and the Town of Hempstead as well as National Water Permit #7, 43, if the sub-project is seaward of mean high water and/or discharge or removal of fill into waters of the United States.

Project implementation can begin once Sub-Project 1 is completed and the design, permitting and environmental review are complete. The Engineering Study would be completed in Sub-Project 1 to determine and reinforce the feasibility of Sub-Projects 2 through 6.

Jurisdiction: Town of Hempstead, Village of East Rockaway, Nassau County. A multi-jurisdictional committee/consortium of municipalities could be considered, as well. This form of governance and administration has proven successful on Long Island, as represented by both the Hempstead Harbor Protection Committee and Manhasset Bay Protection Committee. Potential actions of such a multi-jurisdictional committee/consortium might include being able to appoint a fiduciary to be responsible for grant management, with the committee/consortium itself being responsible for project management. The recent New York – Connecticut Sustainable Communities Consortium, a program funded by a HUD Sustainable Communities Regional Planning Grant, used this structure and was successful in carrying out the planning program over a wide geography and across numerous municipal boundaries.