Environmental Protection

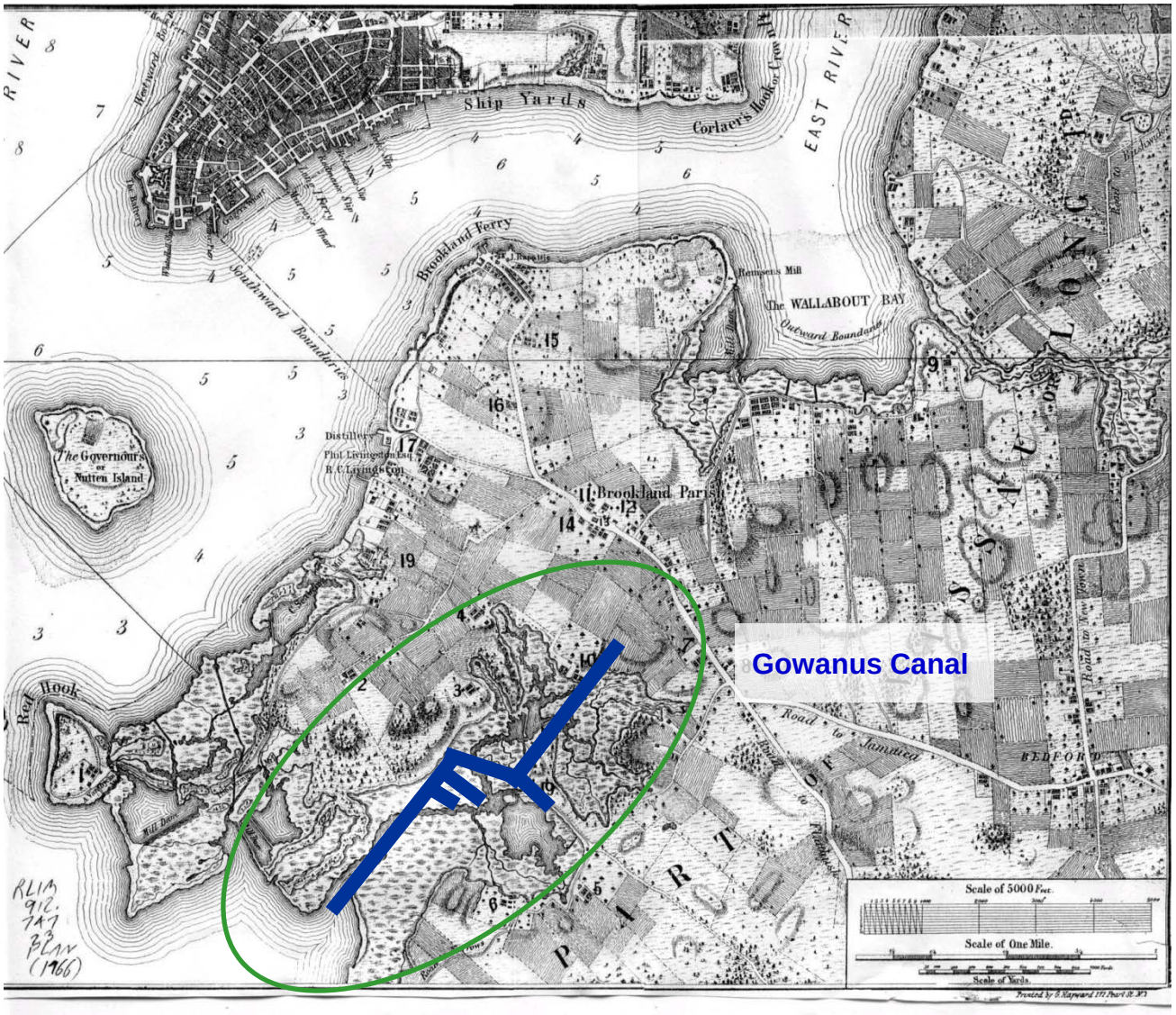
Gowanus Canal
Water Quality Improvements

Community Advisory Group
September 27, 2011

Overview

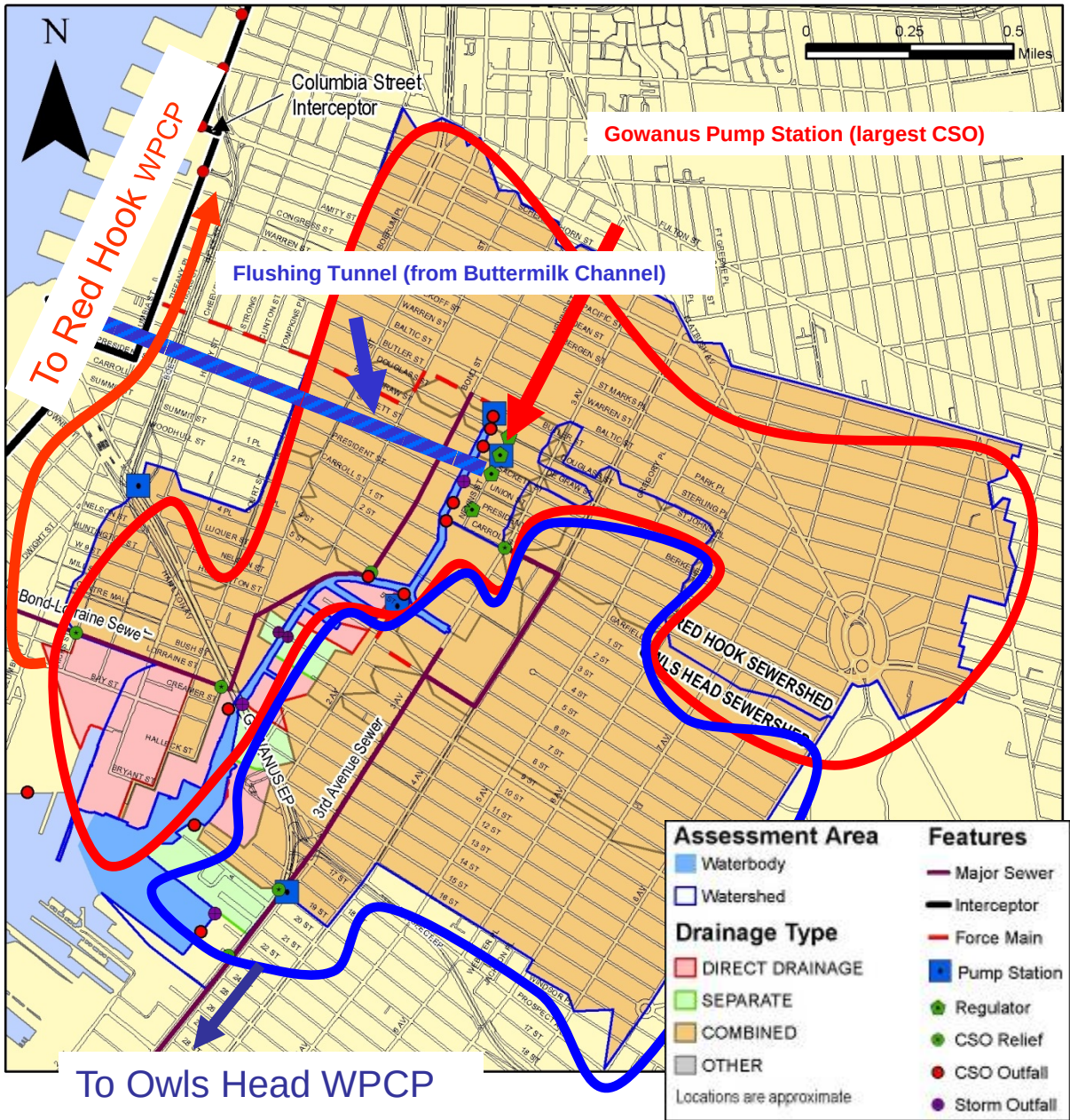
- DEP's Water Quality Program
- Planned Improvement Projects
- Ongoing Water Quality Programs
- Green Infrastructure

Gowanus Canal Historic Drainage



Understanding the Watershed

- Entirely urbanized sewershed
- No continuous fresh inputs
- 1,759 Acres
  - 92% Combined (1,613 acres)
  - 8% Stormwater (146 acres)
- 2 WPCP service areas
  - Red Hook WPCP
  - Owls Head WPCP
- Pumping stations
- 11 CSO outfalls
- 4 storm sewer outfalls
- 300 +/- MG (typical year)
  - CSO: ~70%
  - Stormwater: ~30%
- ~ 200 other piped discharges



DEP's Water Quality Program

CSO Controls

- Gowanus Facilties Upgrade ($140,000,000)

Odor/Aesthetic Improvements

- Environmental Dredging = ($20,000,000)

Conveyance System

- High Level Storm Sewers ($20,000,000)
- Bond-Lorraine Sewer Cleaning ($475,000)
- 4th Avenue Sewer Cleaning ($210,000)
- Red Hook Interceptor Inspection ($96,000)
- Owls Head Interceptor Inspection ($52,000)

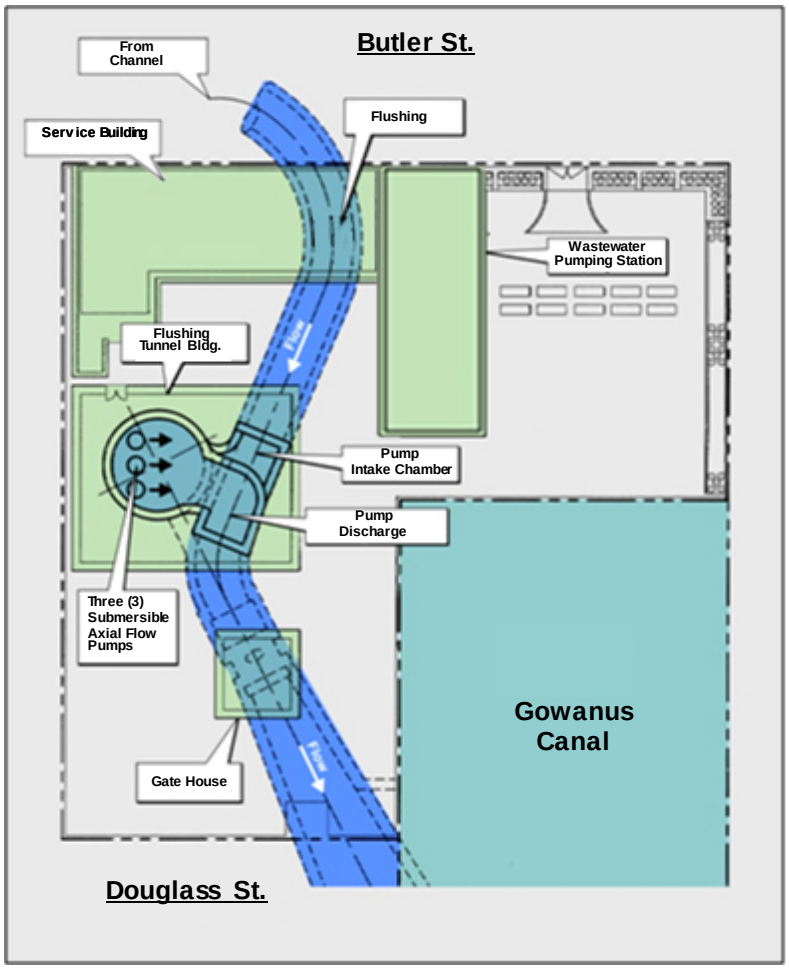
Green Infrastructure

- Dean Street/Downtown Brooklyn ($170,000)
- Community Grants Program ($350,000)
- EBP Grant ($580,000)
- Future Green Infrastructure

Proposed Post-Upgrade Rendering of the Gowanus Facilities

Pumping Station Upgrade

- Upgrade will reduce CSO discharges by 34%, significantly reduce floatables discharges at head end and odors from Pumping Station
- Improvements include:
  - Increase pumping capacity from 20 to 30 MGD
  - New superstructure to enclose all process areas
  - Screening device to remove floatables from CSO discharges
  - Addition of grinders to process increased screenings and send to WWTP (no storage on-site)
  - Restore force main through Flushing Tunnel to relocate discharge to Columbia St Interceptor



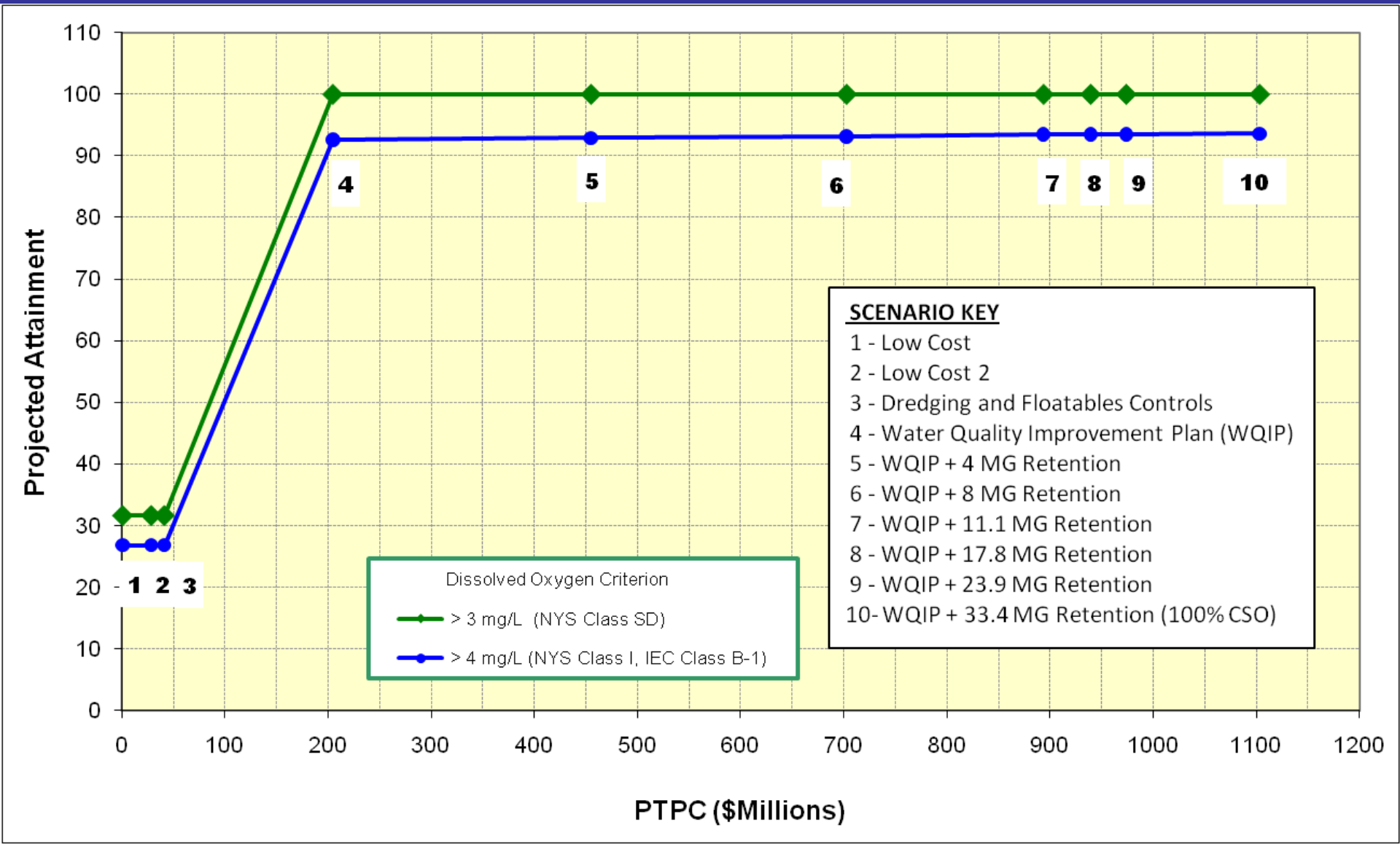
Flushing Tunnel Improvements

- Upgrade will increase flow through tunnel, improve dissolved oxygen and coliform levels, and minimize shutdowns during repair and maintenance
- Improvements include:
  - Interim oxygen transfer system to maintain DO levels and reduce odors
  - 3 vertical, submersible, axial flow pumps
  - Standard equipment for replacement and parts
  - Estimated flows:
    - Peak of 252 MGD at high tide (30% increase)
    - Average Daily Flow of 215 MGD (40% increase)

Projected Benefits

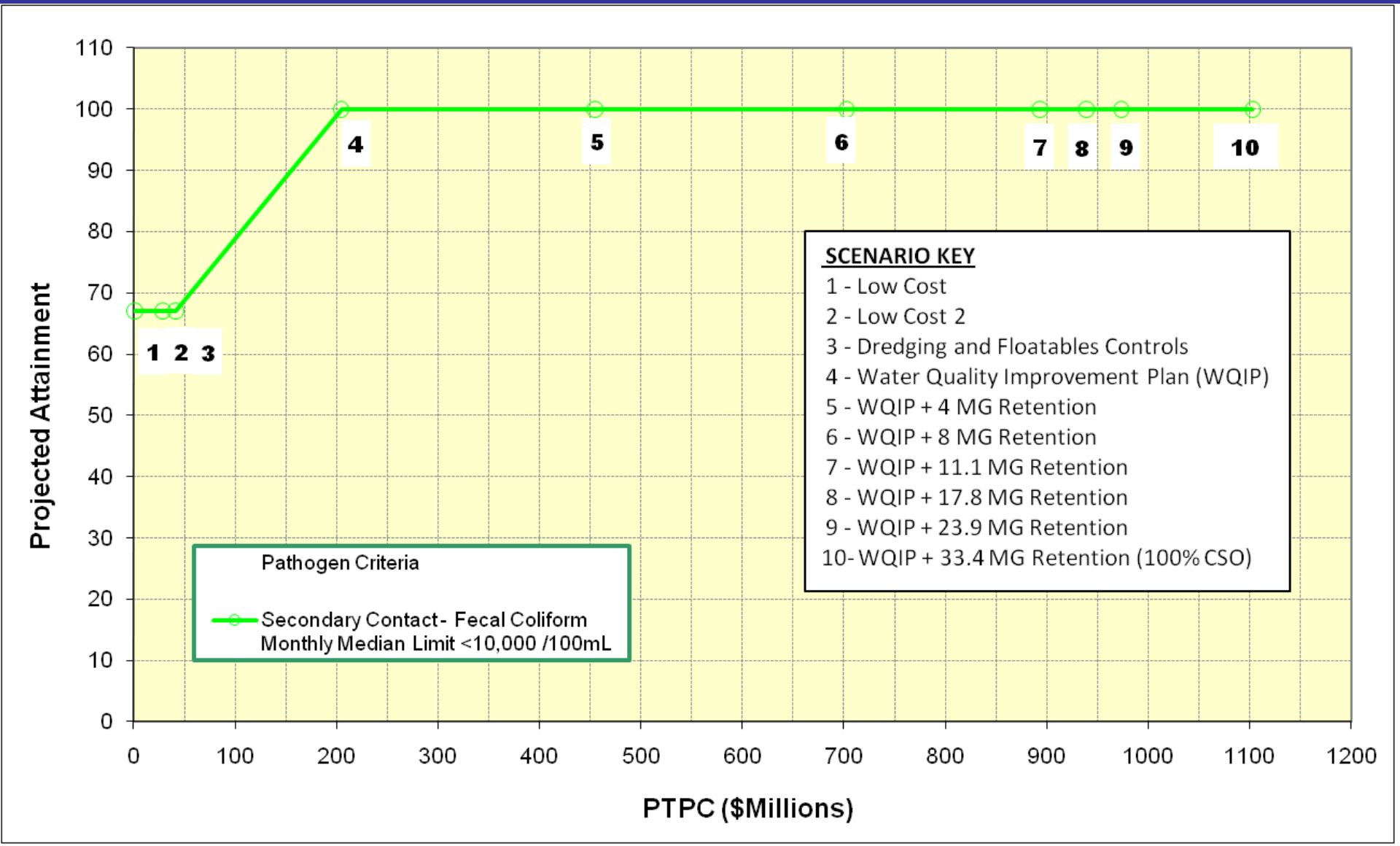
- 34% reduction of CSO volume
  - 37% corresponding reduction in sediment
- Improve dissolved oxygen levels
  - Allow for fish propagation 93% of time
  - Remaining physical limitations due to anthropogenic conditions such as high bulkheads, turning basins, etc.
- Potential to attain secondary contact standards for bacteria
  - Bacteria standards currently do not apply in Canal
  - Substantial reduction: projected to meet secondary contact standards
- 78% reduction of floatables
  - Through CSO reduction and screening at Gowanus Pumping Station
  - Address remaining floatables with waterbody skimming
- Post-construction monitoring to provide relevant data and determine extent of improvements

Attainment of Dissolved Oxygen vs. Cost



Additional CSO controls do not increase attainment.

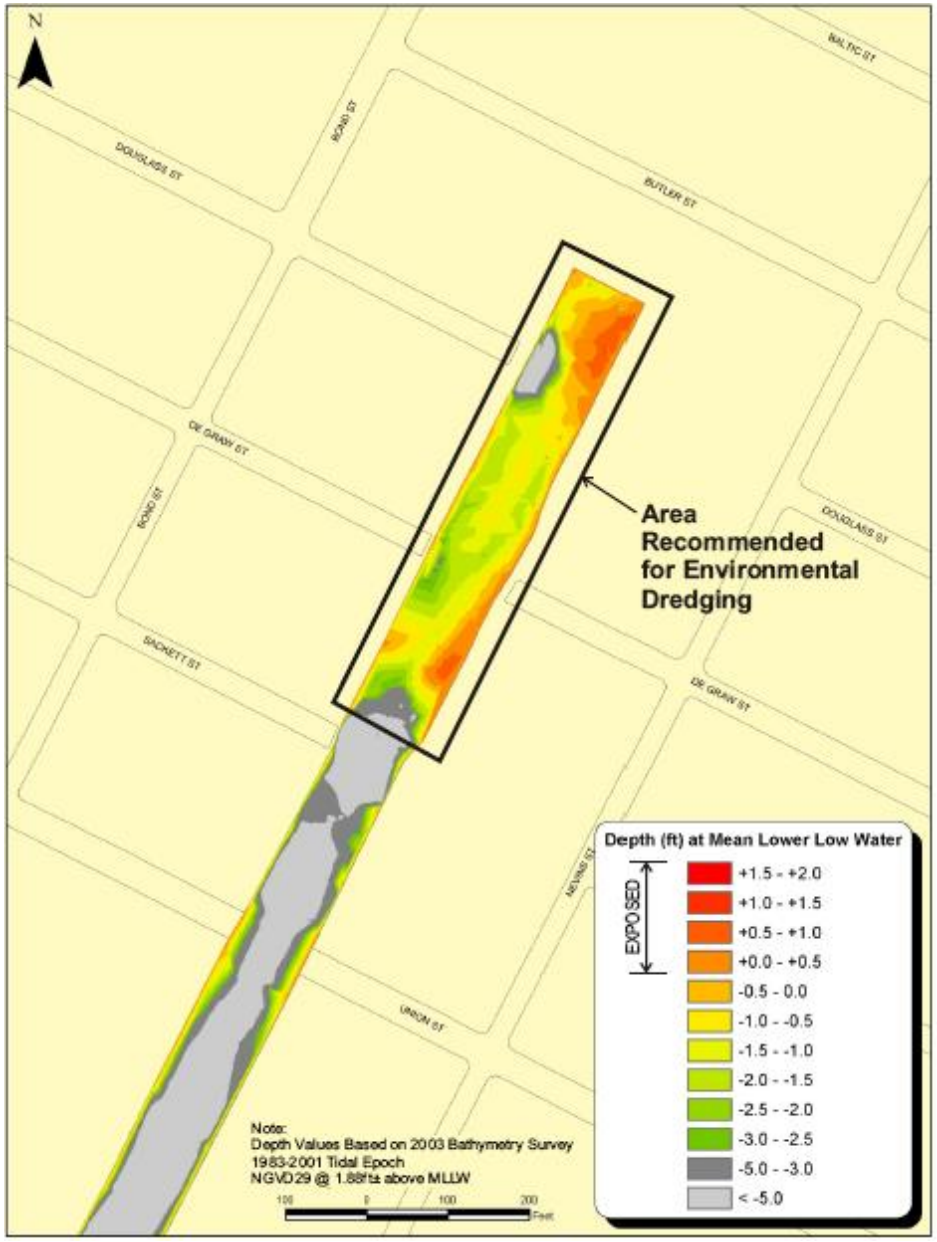
Attainment of Fecal Coliform vs. Cost



CSO controls projected to result in pathogens attainment that would allow boating; post-construction monitoring needed to confirm.

Environmental Dredging

- Dredge sediments to 3 ft below MLLW
- Approximately 750 ft (head of Canal to Sackett St)
- Eliminate exposed sediments and associated odors
- Approximately 10,000 cubic yards to be removed
- Permit application to be submitted February 2012
- Dredging to start within 3 years of permit approval



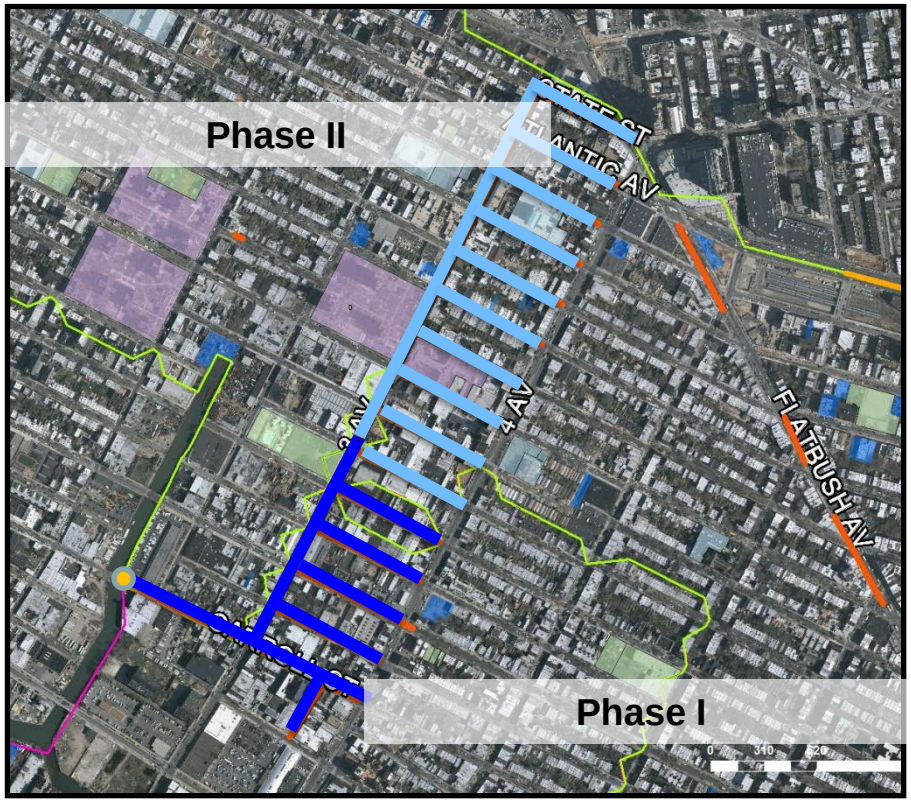
High Level Storm Sewers (HLSS)

- Redirect existing catch basin flow from combined sewer to new HLSS
- Primary benefit includes reductions in street flooding
- Provides more capacity in the existing system including downstream interceptors
- Completed hydraulic analysis to determine feasibility for “Carroll Street Outfall” and CSO volume reduction of approximately 5% projected with modeling

High Level Storm Sewers (HLSS)

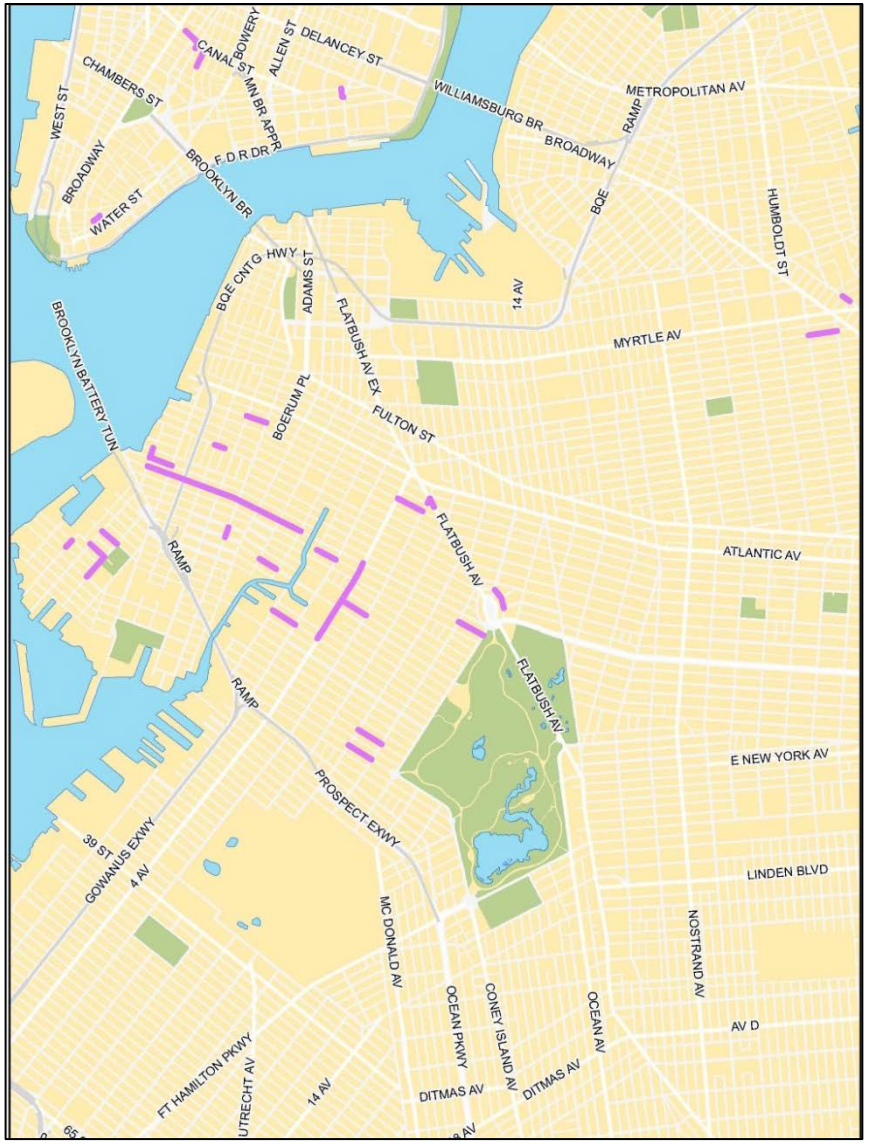
Carroll Street Outfall Amended Drainage Plan includes:

- HLSS to capture 50% of drainage area runoff
- 96-acre area bounded by 1st Pl, 4th Ave, State St, 3rd Ave
- A new storm outfall would be located at Carroll St
- Phase I design expected in FY12, and construction in FY13
- Phase II design expected in FY19 and construction in FY20



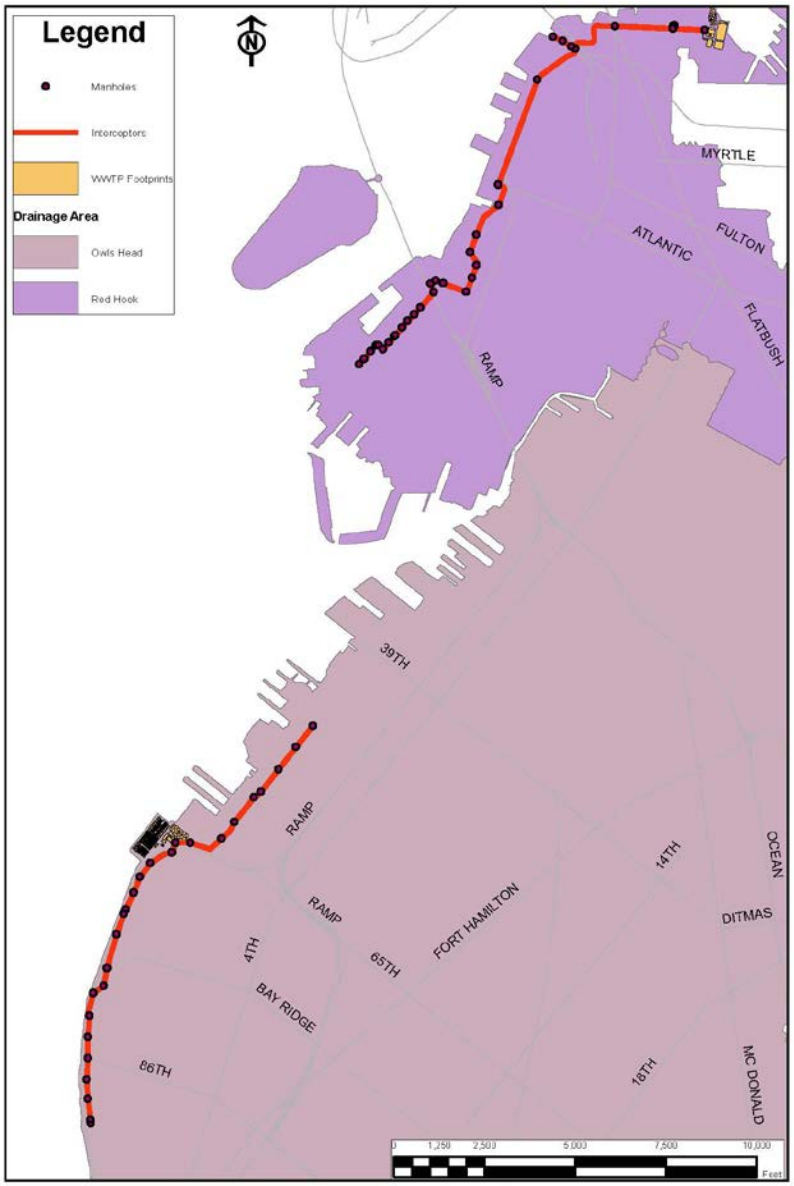
System Optimization: Sewers

- 4th Ave activities for 2011 calendar year, to date:
  - Over 37,355 linear feet of sewers cleaned in response to complaints
  - 724 cubic yards of silt, grease, and debris removed
- Bond-Lorraine sewer cleaned in 2004:
  - 110,000 cubic yards removed from Bond Lorraine Street Sewer from Bond and 4th Streets to Lorraine and Court Streets



System Optimization: Interceptors

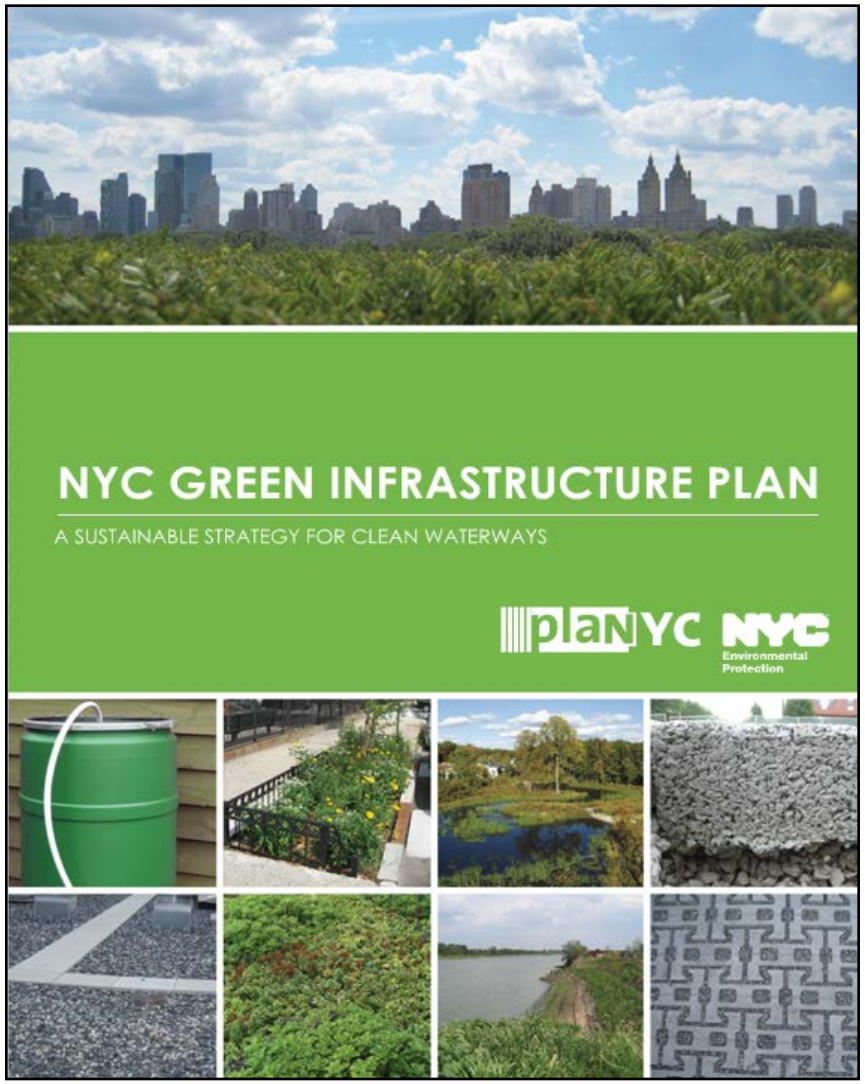
- In 2010, launched two-year program to systematically clean the City's interceptors
- Two new vactor trucks were purchased (cost $450K each)
- Current program statistics for Gowanus Canal:
  - 90% of a total of 16,530 linear ft in Red Hook drainage area inspected
  - Inspection in Owls Head drainage area started and 2,200 ft of 14,000 ft surveyed to date



Industrial Pretreatment Program

- Established in 1987 to control the introduction of toxic substances into public sewers that are tributary to WWTPs
- In 1992, DEP added a corrosion inhibitor (orthophosphate) to reduce leaching of lead
- Significant reduction of other metals due to:
  - Industries/businesses moving out of NYC or going out of business (currently, industries contribute less than 3% of the metals to the plant influent citywide)
  - Majority of metals in plant influent are from plumbing pipes/ fixtures
- Regulates discharge from 9 Significant Industrial Users in Red Hook and Owls Head drainage areas

NYC Green Infrastructure Plan



- Green infrastructure goal: Control runoff from 10% of impervious surfaces through green infrastructure and other source controls
- To implement, DEP created:
  - An interagency Green Infrastructure Task Force to design and build stormwater controls into planned roadway reconstructions and other publicly funded projects
  - The Green Infrastructure Steering Committee to promote partnerships with numerous community and civic groups and other stakeholders to support and steward green infrastructure
- Annual Report on green infrastructure implementation will be released in October 2011

Green Infrastructure

Bioswale constructed on Dean Street at 4th Avenue.

Right-of-Way Bioswales

- Total of seven bioswales to be constructed in partnership with DDC and DOT's Downtown Brooklyn Traffic Calming Project
- Each to be located upstream of an existing catch basin
- 3,125 square foot drainage area per bioswale
- Native plants, engineered soil, non-woven geotextile and HPDE pipe barrier installed to enhance infiltration
- DPR to regularly inspect and maintain as necessary

Green Infrastructure

Community Grants Program

- Funding for green infrastructure to manage at least 1 in of rainfall on private property and public sidewalks
- Private property owners, businesses, and not-for-profit organizations are eligible
- Over $3 million awarded in 2011
- Over $350K going to projects in the Gowanus Canal
- Grant program will be extended for 2012

Permeable Pavers

Bioswales

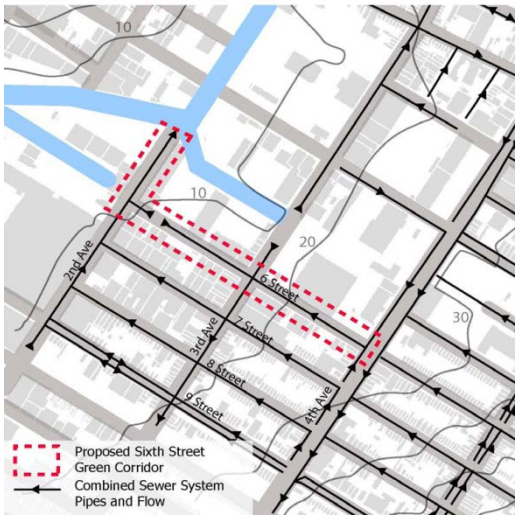
Green Roofs

Green Infrastructure

Environmental Benefits Program (2010)

- $580k grant to Gowanus Canal Conservancy for the 6th Street Green Corridor Project
- A series of curbside swales ranging from 400 to 1,200 square feet along 6th Street and 2nd Avenue (“Green Corridor”)
- Swales will control runoff from approximately an acre of street and sidewalk surfaces (pending final design)
- Approximately 40% of the runoff captured from study area

6th Street Green Corridor Project

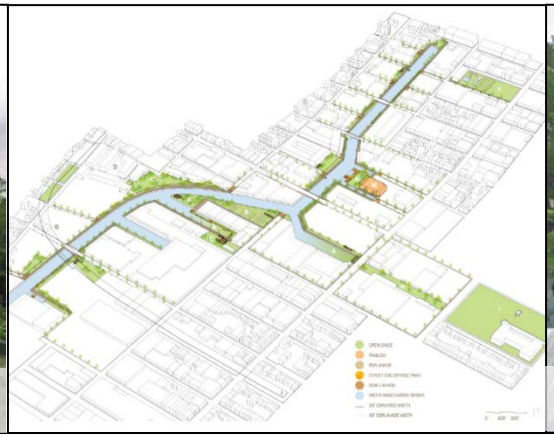


Green Infrastructure

Gowanus Canal Conservancy and dlandstudios' Designs

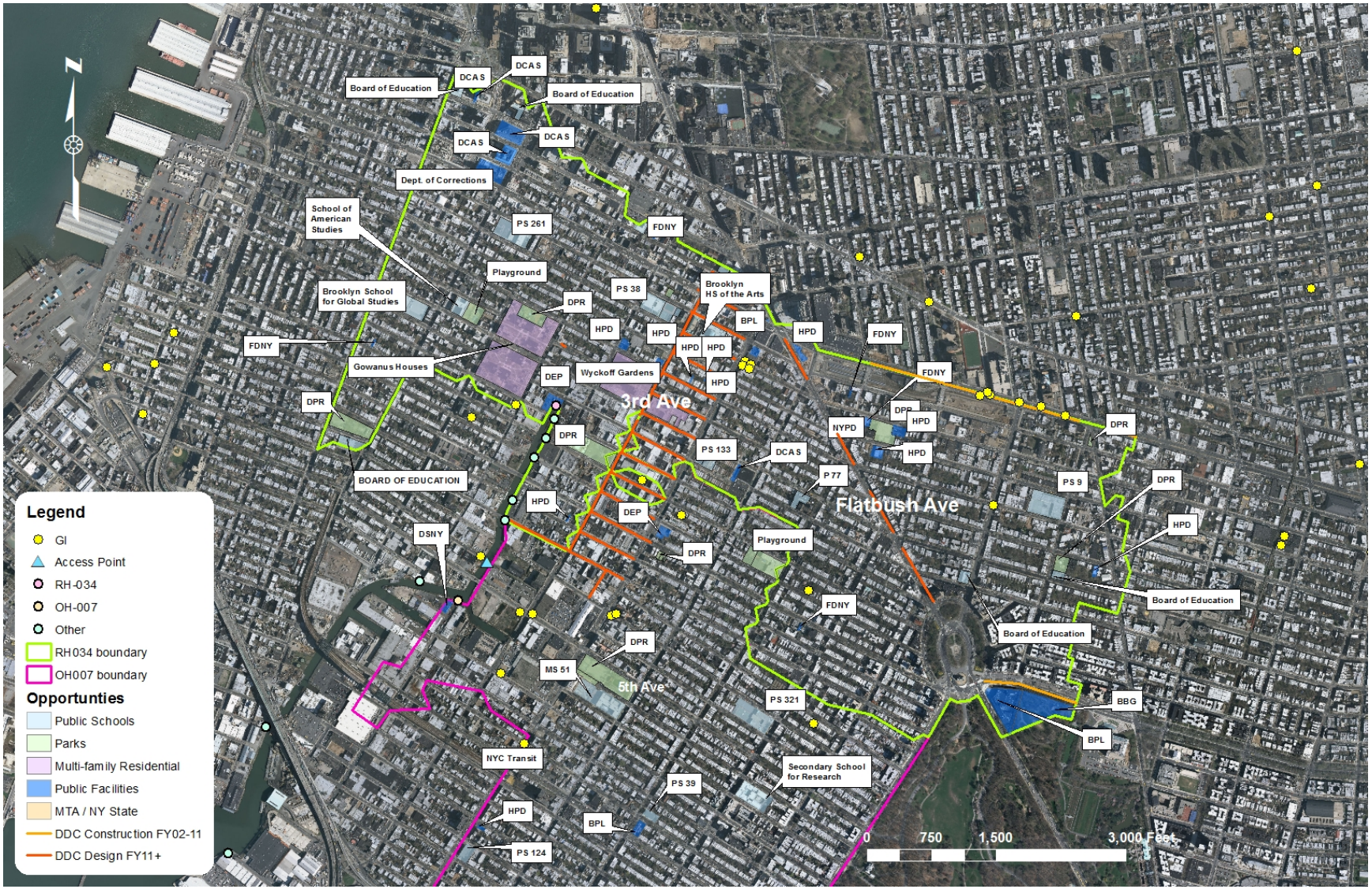
- Combination of federal, state, and city funding
- Located at end of 2nd Street along eastern edge of the Canal
- Rectangular planting beds approximately 28 ft by 40 ft to manage street runoff:
  - Runoff will be filtered by vegetation within swale or infiltrate through the open bottom of swale
  - Excess runoff is collected after passing through the swale and directed into the storm drain system
- Installations will be evaluated the potential for bio-filtration benefits


Existing Site



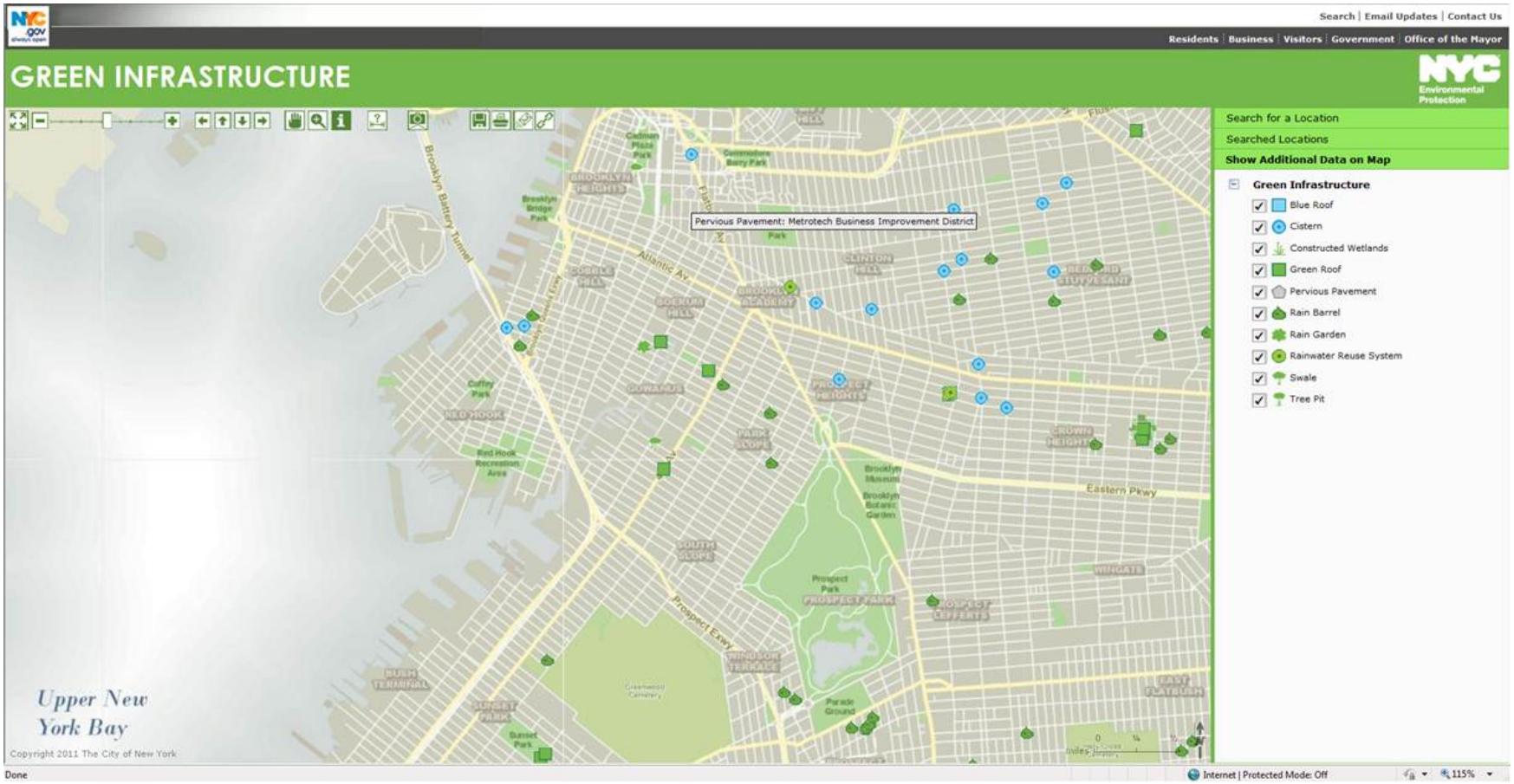

Proposed Site

Ongoing Opportunities Analyses



Existing green infrastructure and publicly-owned properties within RH-034 and OH-007 drainage areas.

GI Web Map



Locate green infrastructure by searching street address, zip code, intersection, block and lot, community board, place of interest or council district:
gis.nyc.gov/doitt/nycitymap

Discusssion

For more information:
nyc.gov/dep

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