

BRONX RIVER PARKWAY STORMWATER RETROFITS

Stormwater retrofitting a site listed on the
National Register of Historic Places



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Director of Environmental Planning

Major Drainage Basins

NAME	SQ. MILES
Croton River	183
Pocantico and Saw Mill Rivers	67
Coastal LI Sound	65
Bronx River	48
Inland LI Sound	45
Peekskill and Haverstraw Bay	43

[GIS Interactive Mapper](#)



Bronx River Parkway

Constructed in 1925

First public parkway

First County park

12.5 miles from Bronx to

Kensico Dam

10 most northern miles listed

on the National Register of

Historic Places 1990

NYS Scenic Byway 1995

Commuter rail line

48 sq mi watershed, 14

municipalities

Bronx River and floodplain

Tributaries, lakes and ponds



The Bronx River in the 1890s -- an open sewer



Bronx River Parkway

Completed in 1925 – the nation's first public parkway



Watershed Planning

The County has expertise in working with watershed municipalities to develop watershed plans with specific recommendations for action. This makes it easier to obtain grant funding for project implementation.

The Croton Plan For Westchester

The Comprehensive Croton Watershed Water Quality Protection Plan

A cooperative effort among:

Town of Bedford
Town of Cortlandt
Town of Lewisboro
Village/Town of Mount Kisco
Town of New Castle
Town of North Castle
Town of North Salem
Town of Pound Ridge
Town of Somers
Town of Yorktown
Westchester County

SEPTEMBER 2009

Westchester
GOV.COM

Andrew J. Spano, Westchester County Executive

WESTCHESTER COUNTY DEPARTMENT OF

Andrew J. Spano, Westchester County Executive
County Board of Legislators

BRONX RIVER WATERSHED MANAGEMENT PLAN (VOLUME 1)

STORMWATER POLLUTION CONTROL PLAN
WESTCHESTER COUNTY, NEW YORK

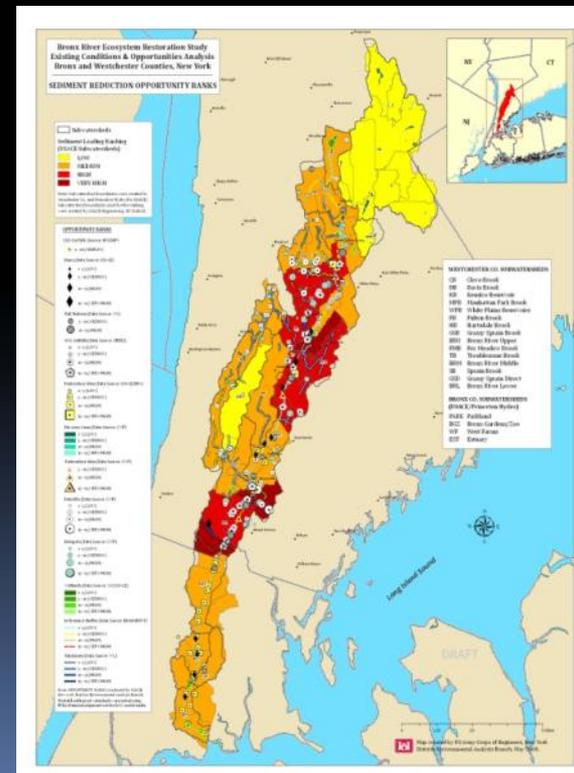
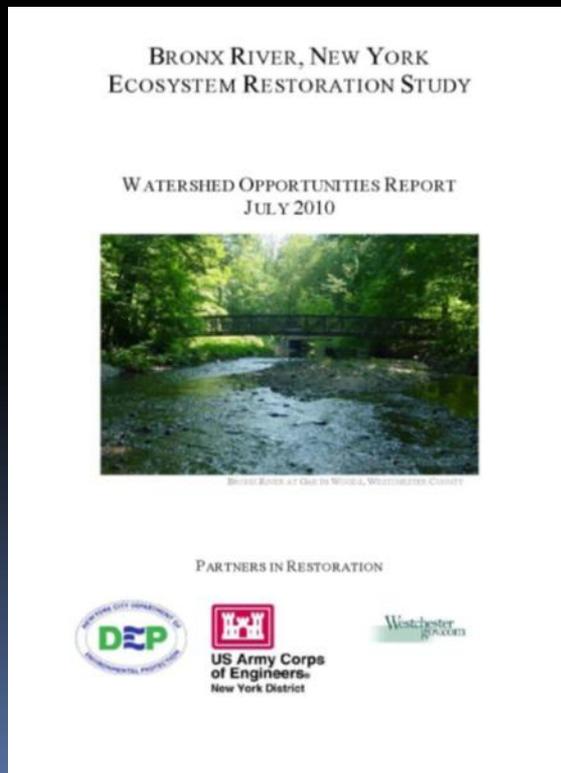


November 2007

WESTCHESTER COUNTY DEPARTMENT OF PLANNING
Gerard E. Mulligan, AICP, Commissioner

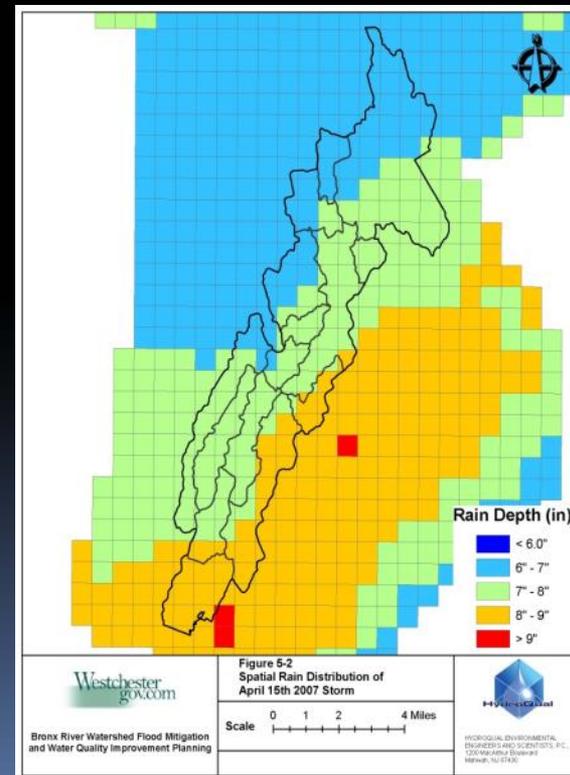
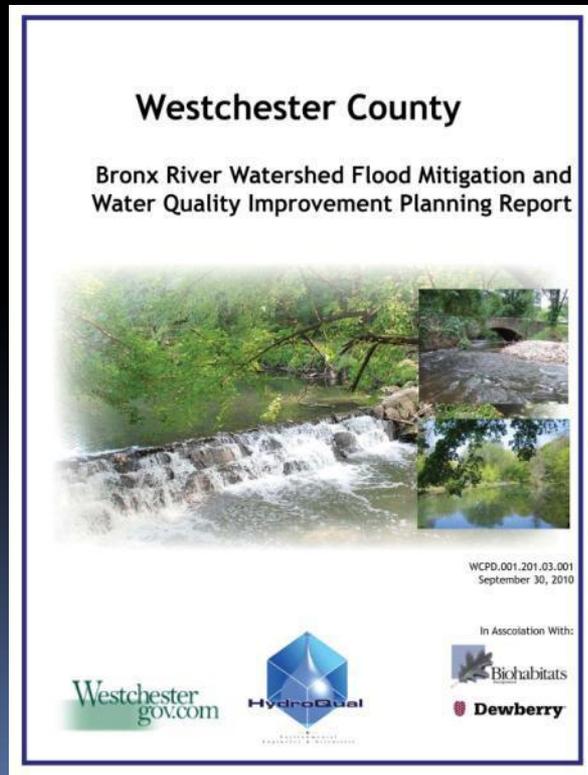
U.S. Army Corps of Engineers Ecosystem Restoration Study

Begun 2003 by the USACE with NYCDEP and Westchester as partners, the study is currently inactive. Substudies (sediment loading, hydrologic and hydraulic modeling) will be useful for flood mitigation planning.



Stormwater Management Modeling Tool Prepared By HDR/HydroQual

Final Bronx River Watershed Report (09/30/10) at:
[environment.westchestergov.com](http://environment.westchestergov.com/images/stories/qtrly/7QBronxRivWatershedFinal10.pdf)
[/images/stories/qtrly/7QBronxRivWatershedFinal10.pdf](http://environment.westchestergov.com/images/stories/qtrly/7QBronxRivWatershedFinal10.pdf)



County projects through the Soil and Water Conservation District

- Carpenters Pond (completed) (\$950K)
 - Allows for pre-storm drawdown
- Gravel Wetland (completed) (\$133K)
 - Provides extended detention
- Popham Road (completed) (\$133K)
 - Streambank stabilization
- County Center (in-progress) (\$550K)
 - Streambank stabilization
- Six Rain Gardens, County Properties (completed) (\$60K)
 - Provides extended detention
- Dickerman's Pond (completed) (500K)
 - Increased storage and infiltration



SWCD Projects – Crestwood Maintenance Facility

This rain garden and bioswale treats stormwater runoff from the Crestwood Maintenance Facility before it enters the Bronx River. Signs placed along the Bronx River pathway, which runs alongside the area, educate residents of the project.



SWCD Projects – Crestwood Maintenance Facility

This rain garden and bioswale treats stormwater runoff from the Crestwood Maintenance Facility before it enters the Bronx River.



SWCD Projects – Popham Road Stream Bank Stabilization



SWCD Projects – Popham Road Stream Bank Stabilization



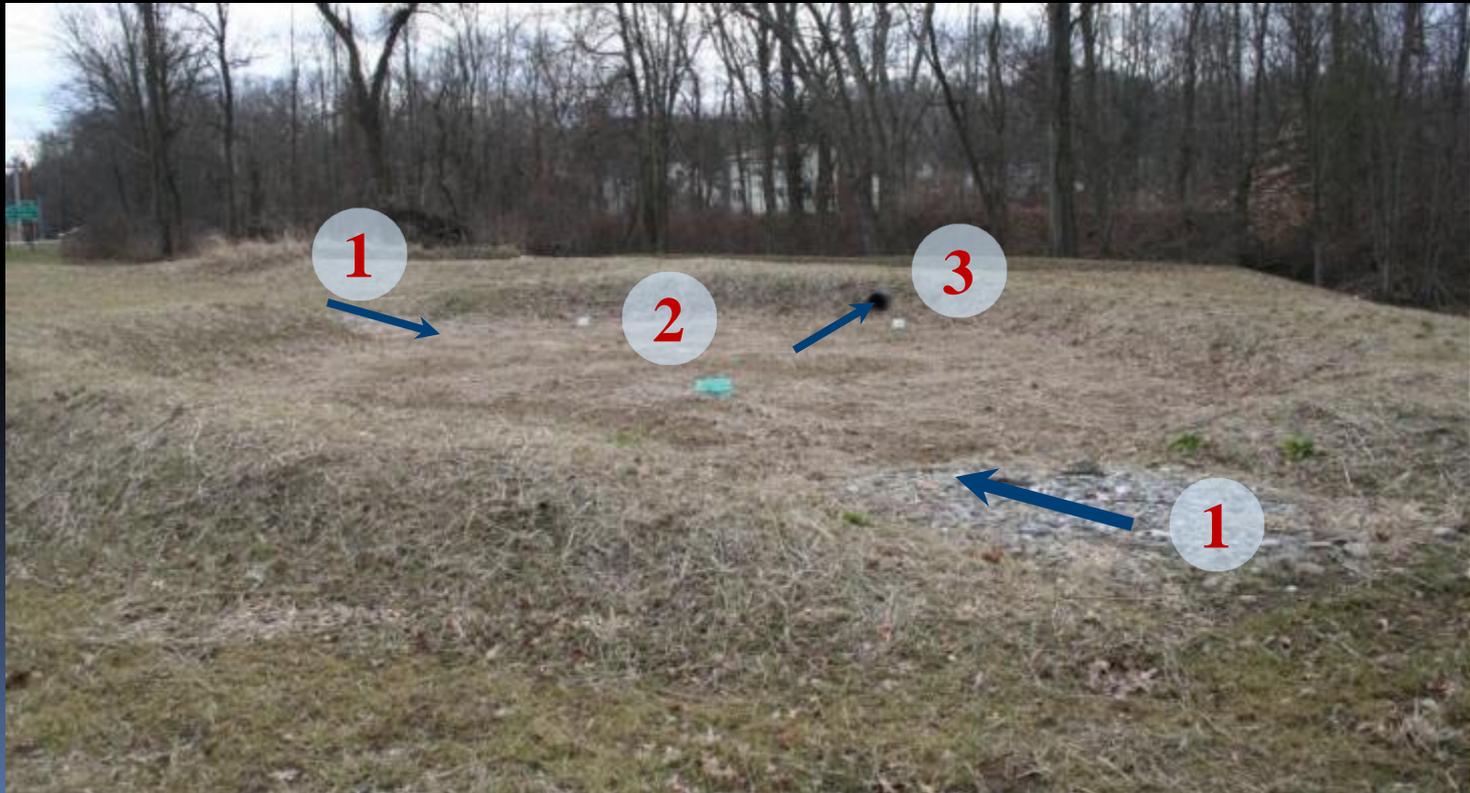
SWCD Projects – Gravel Wetland at Parkway Homes Road

Gravel wetland along Bronx River Parkway near Parkway Homes Road under construction. The gravel wetland will capture and store runoff in the large gravel beds and the surface detention components of the system.



Bronx River Parkway Gravel Wetland

Stormwater enters the first cell of the gravel wetland (1). Water is treated in the cell and sent to the second cell via perforated pipes below grade in the gravel medium (2). Overflow is transported to the second cell through a surface pipe (3).



Bronx River Parkway Gravel Wetland

The second cell of the gravel wetland provides additional storage and treatment, reducing runoff volume and releasing water slowly over time. The pipe to the left (1) discharges surface water stored in the basin, and the emergency spillway is seen along the rear berm (2). Also visible are inspection ports for the subsurface perforated pipes (3).



Bronx River Parkway Gravel Wetland

Gravel wetland along Bronx River Parkway at Parkway Homes Road completed. The gravel wetland appears as a landform and will be illegible once the grass grows.



SWCD Projects – Scout Field Phase I

Stream bank stabilization and stormwater wetland at Scout Field detains and treats stormwater runoff before it enters the Bronx River.



SWCD Projects - Scout Field Phase I

Stream bank stabilization and stormwater wetland at Scout Field detains and treats stormwater runoff before it enters the Bronx River.



County Capital Projects

- Bronx River Parkway (completed)
 - Stormwater swales and wetlands provide extended detention and encourage infiltration
- County Center Stormwater Park (completed)
 - Porous pavement, bioswales, subsurface storage and stormwater wetlands all provide extended detention and encourage infiltration



Bronx River Parkway Center Median Bioswale

Bioswale in center median treats runoff from the Bronx River Parkway holds water from smaller storms and treats it.



Bronx River Parkway Stormwater Wetlands

Stormwater wetlands such as these south of Fisher Lane treat runoff from the Bronx River Parkway hold water from smaller storms and provide treat it using vegetation and infiltration. Larger storms overflow into the storm drain system.



Bronx River Parkway Roadside Swales and Wetlands



WESTCHESTER COUNTY CENTER STORMWATER PARK

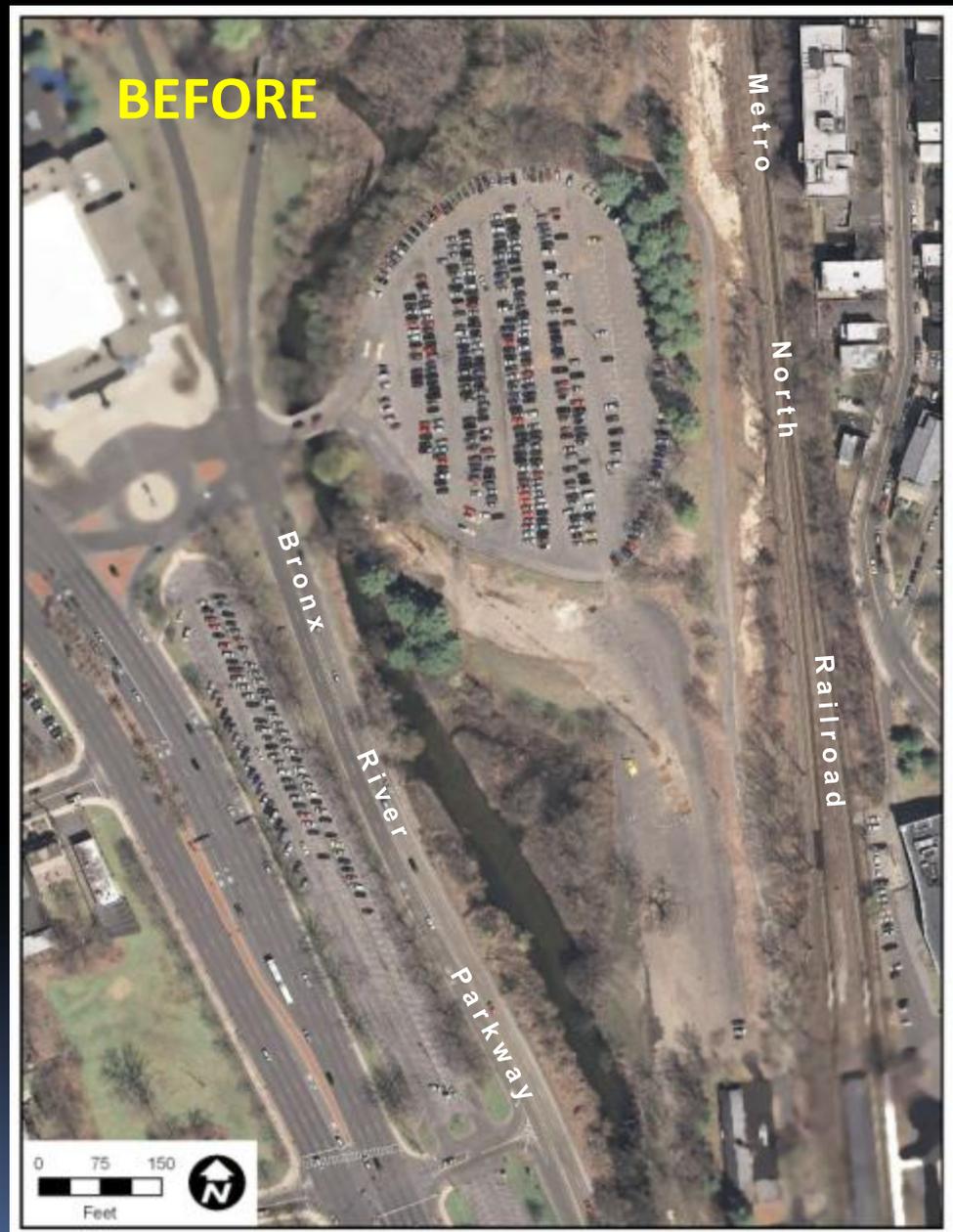
A Variety of Stormwater Best Management Practices (BMPs) for Study and Demonstration



County Center Stormwater Park

PRIOR PARKING LOT LAYOUT:

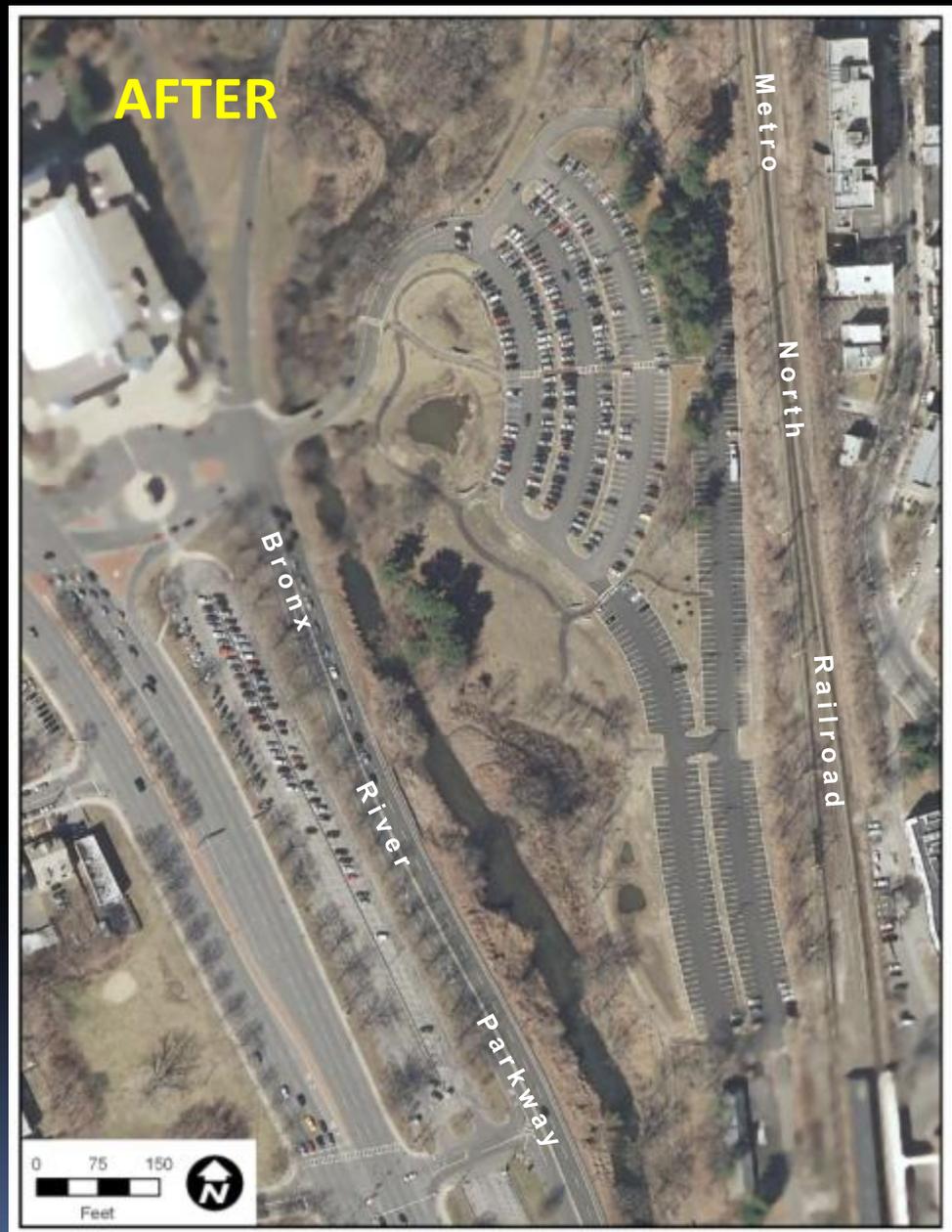
- Large central lot
- No dedicated pedestrian circulation
- Large gravel lot in southern portion of site
- Limited queue space into site
- Disjointed pedestrian pathway through site



County Center Stormwater Park

REDESIGN OF PARKING LOT:

- Improved vehicular layout
- Dedicated pedestrian paths and crosswalks
- Improved Bronx River pathway
- Improved landscaping
- New lighting
- New control points and gatehouses
- Long entrance queue



County Center Stormwater Park

Stormwater BMP Characteristics

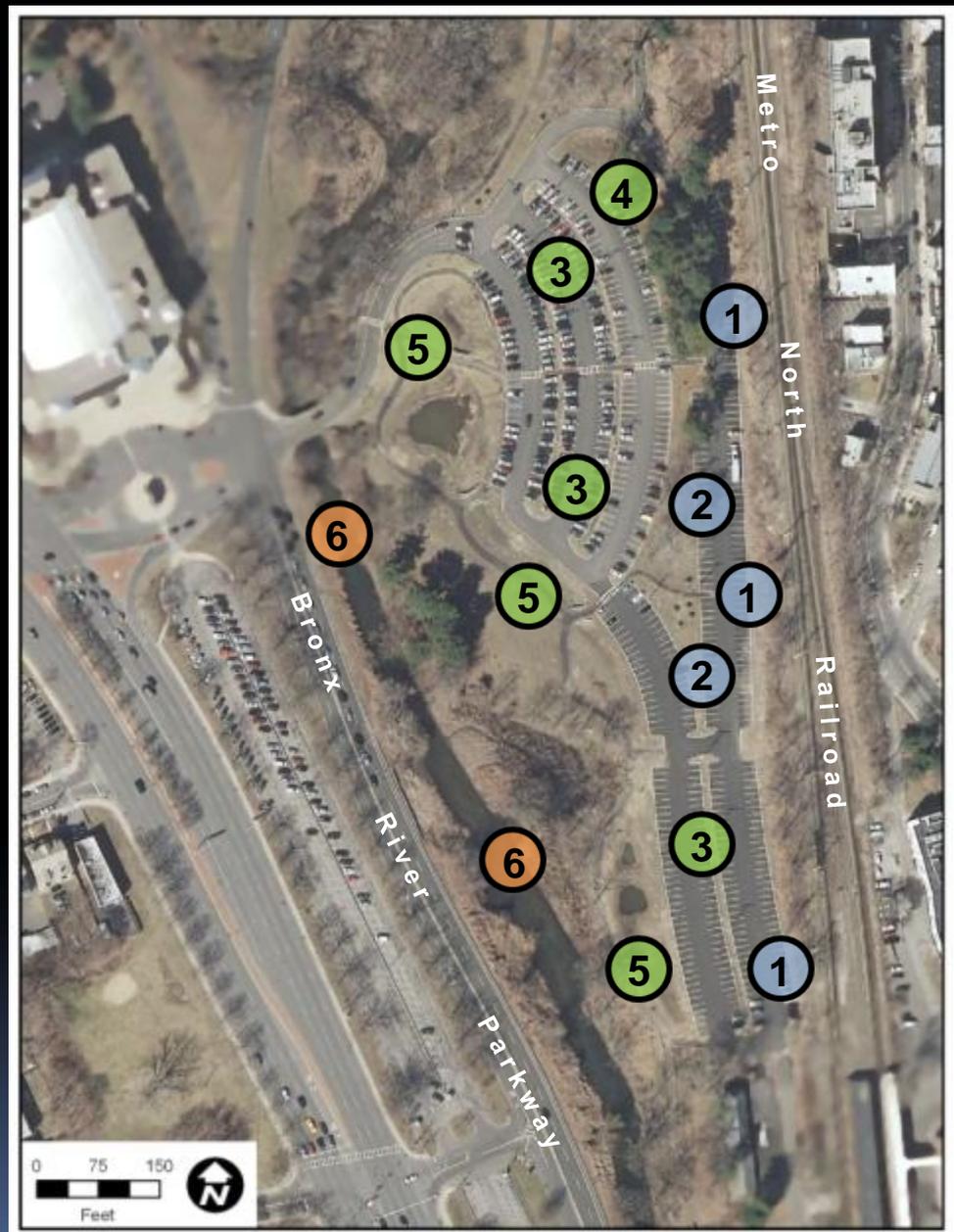
- Underground detention and infiltration
- Utilizes surface detention and vegetation for treatment
- Restoration of degraded streambank and buffer



County Center Stormwater Park

STORMWATER BEST MANAGEMENT PRACTICES:

- 1 POROUS PAVEMENT
- 2 UNDERGROUND DETENTION
- 3 BIOSWALES
- 4 RAIN GARDENS
- 5 STORMWATER WETLANDS
- 6 STREAMBANK RESTORATION



County Center Stormwater Park

POROUS PAVEMENT



County Center Stormwater Park

UNDERGROUND DETENTION AND INFILTRATION



County Center Stormwater Park

UNDERGROUND DETENTION AND INFILTRATION

2



County Center Stormwater Park

BIOSWALES/FILTRATION ISLANDS



County Center Stormwater Park

RAIN GARDEN



County Center Stormwater Park

STORMWATER WETLANDS AND SWALES



County Center Stormwater Park

STORMWATER WETLANDS AND SWALES



County Center Stormwater Park

STREAMBANK AND HABITAT RESTORATION



Stream Bank Erosion

Eroded stream bank along the Bronx River south of the County Center.



Stream Bank Stabilization

Stabilized stream edge along the Bronx River at the County Center (under construction).



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Stream Bank Stabilization

Stabilized stream edge along the Bronx River at the County Center.



Wetland Restoration

Restored wetland along the eastern edge of the Bronx River.



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