



# The NYC Green Infrastructure Plan & Community Engagement Program

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Pace University – Downtown Campus

February 2, 2011

## **Why should we consider green infrastructure?**

- water quality
- costs
- sustainability

## **What has NYC done to adopt green infrastructure?**

- demonstration projects
- watershed planning
- office of green infrastructure
- interagency cooperation
- integration into capital projects

## **What are the future steps?**

- integration into regulatory program
- community engagement

# Water Quality in New York City Harbor



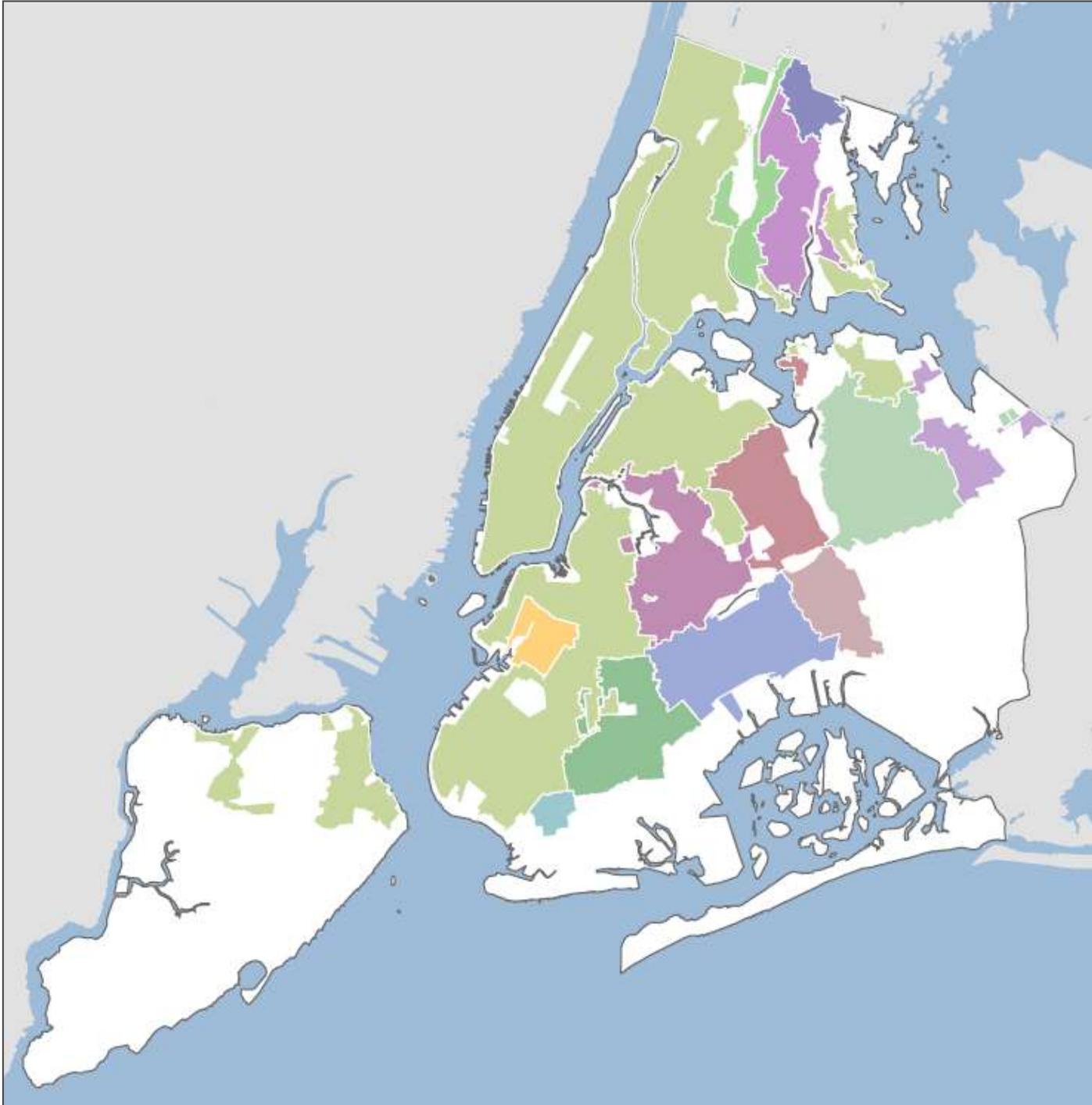
 = does not meet water quality standards (pathogens/DO)

**75%** of Harbor meets pathogen standards for swimming

**19%** meets standards for boating and fishing

**7%** of our Harbor is made up of tributaries that do not meet secondary contact standards

# 13 Different CSO Drainage Areas



**Two-thirds of NYC**  
served by  
combined sewers

**216,000 acres** of  
CSO drainage area

**7,400 miles** of  
sewers

**422 CSO outfalls**

**~30 billion gallons**  
of CSO per year

# Dense, Efficient Settlement is Impervious

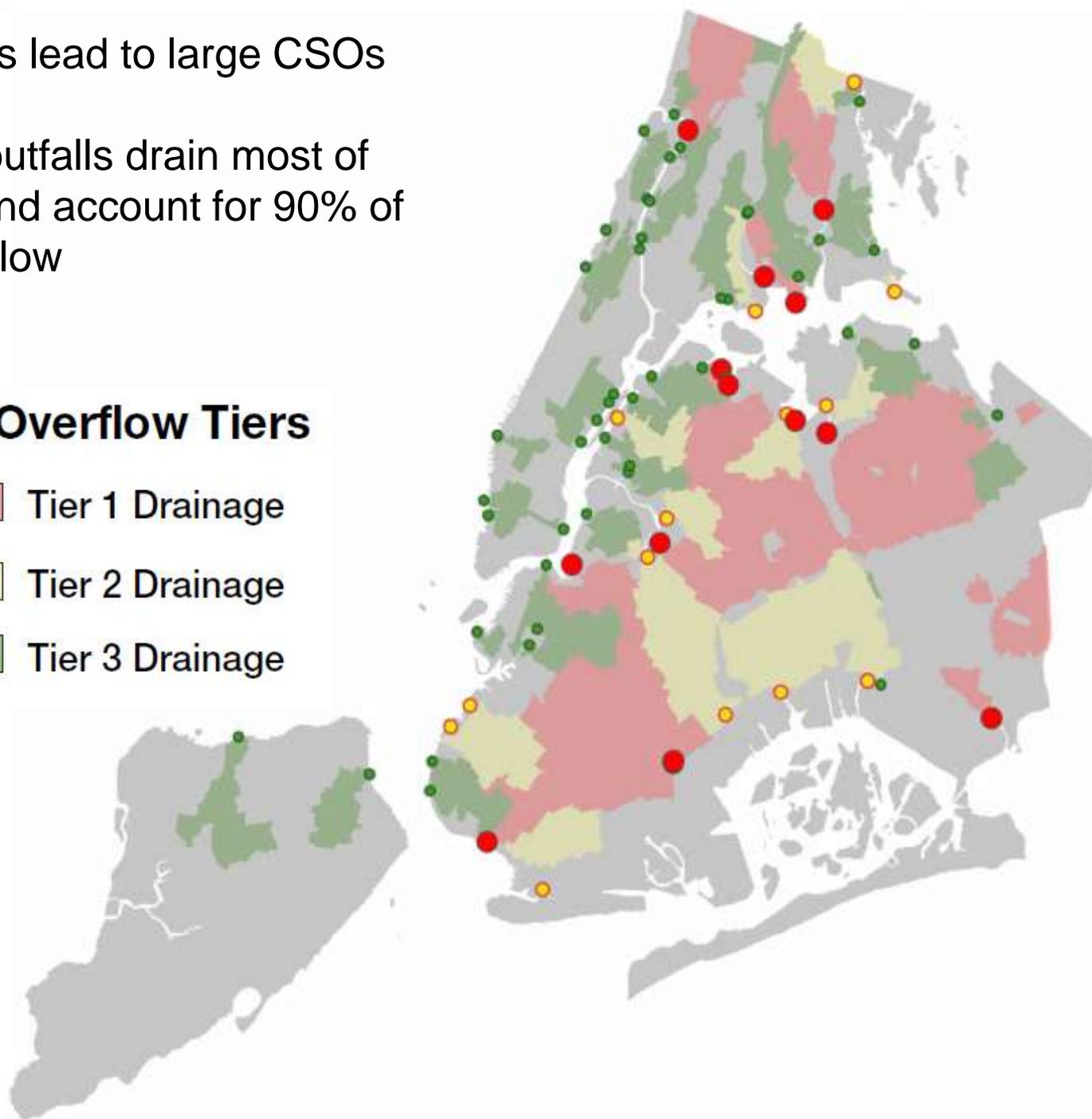


# CSO Volume Relates to Drainage Area

- Large catchment areas lead to large CSOs
- Tier 1 through Tier 3 outfalls drain most of our combined areas and account for 90% of combined sewer overflow

## Combined Sewer Overflow Tiers

● Tier 1 Outfall	■ Tier 1 Drainage
● Tier 2 Outfall	■ Tier 2 Drainage
● Tier 3 Outfall	■ Tier 3 Drainage



- |              |   |
|--------------|---|
| 1992 to 2005 | In consent decrees with the State, DEP commits to build CSO controls  |
| 1994         | EPA's CSO Control Policy requires compliance with Nine Minimum Controls, formulation of Long Term Control Plans (LTCPs) |
| 2000         | Wet Weather Water Quality Act   |
| 2007 to 2011 | DEP submits Facility Plans for 13 separate CSO Watersheds   |
| 2011 to 2017 | DEP prepares and submits 14 LTCPs   |

- 2006 - U.S. Conf. of Mayors, environmental groups support use of green infrastructure
- 2007 - EPA agrees to formalize use of green infrastructure  
EPA memoranda on using green infrastructure in regulatory programs, permits, enforcement

	Grey	Green
Existing Consent Orders	Required	Absent
Facility Plans	Required	Discussed
LTCPs	Alternatives Analysis	Alternatives Analysis

# A Sustainable, Hybrid Approach

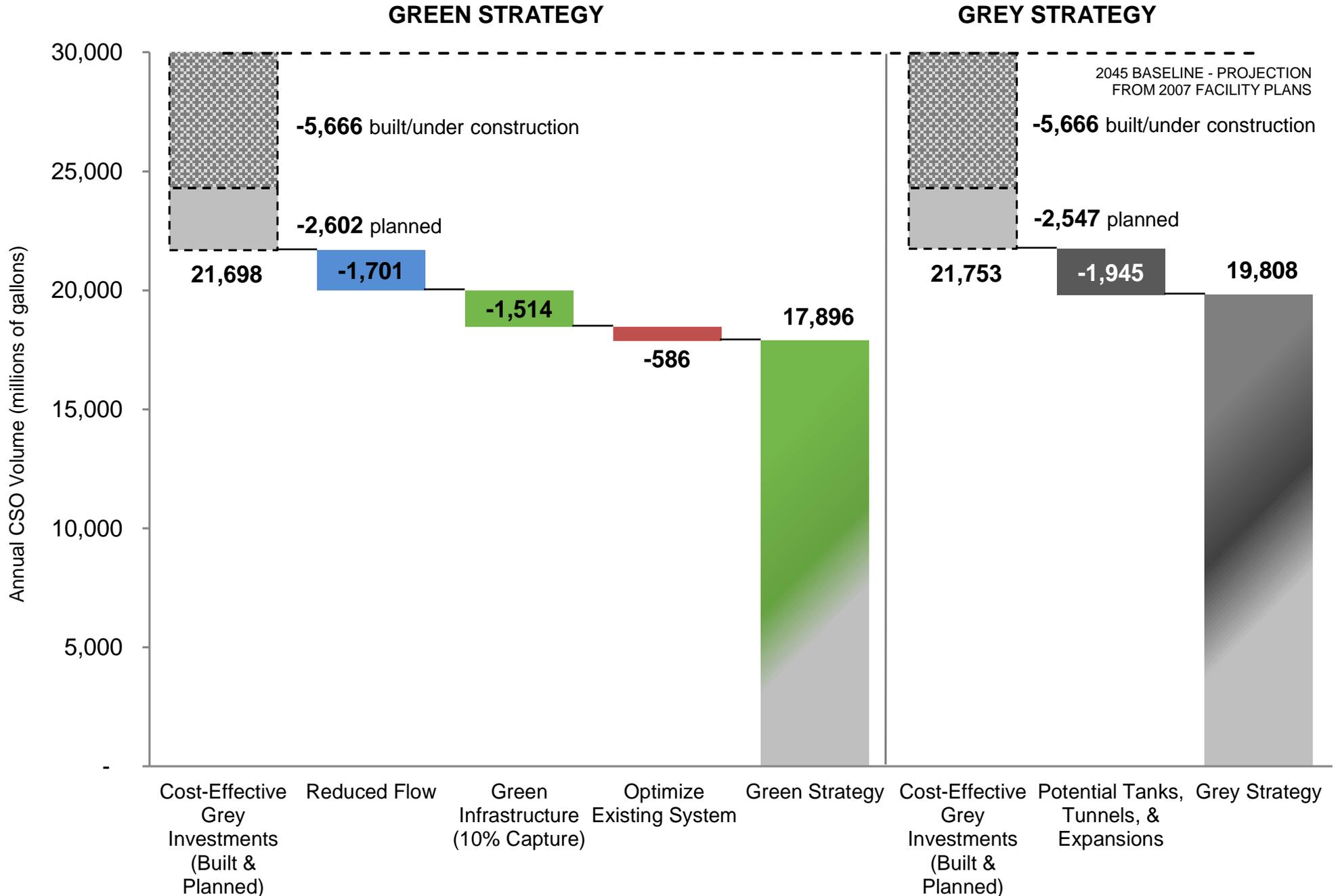


1. Build cost-effective grey infrastructure
2. Optimize the existing wastewater system
3. Control runoff from 10% of impervious surfaces through green infrastructure and other source controls
4. Institutionalize adaptive management, model impacts, measure CSOs, and monitor water quality
5. Sustain stakeholder engagement

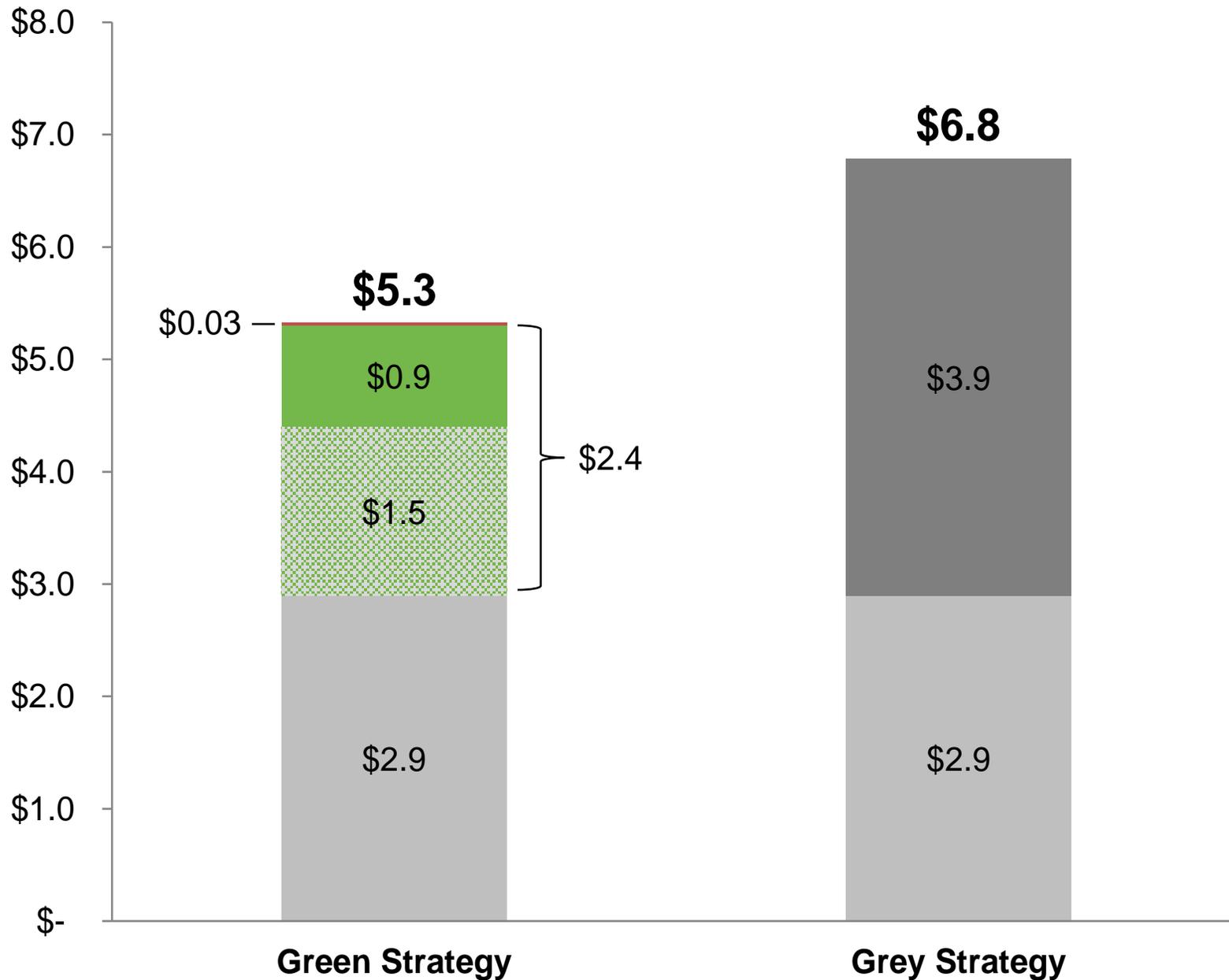
## The Green Strategy

- \$2.9 billion on **cost-effective grey infrastructure** to reduce CSOs by 8.2 billion gallons per year
- \$1.5 billion of public funding plus \$900 million in private investment to **control runoff from 10% of impervious surfaces through green infrastructure and other source controls** to reduce CSOs by over 1.5 billion gallons per year
- We will ensure a **reduced base flow** of sanitary waste to reduce CSOs by over 1.7 billion gallons per year
- We will **optimize the existing wastewater system** through cleaning of interceptor sewers to reduce CSOs by over 500 million gallons per year

# The Hybrid Approach Performs Better



# The Hybrid Approach Costs Less



- Potential Tanks, Tunnels, & Expansions
- Green Infrastructure - Private Investment
- Reduced Flow
- Optimize Existing System
- Green Infrastructure - Public Investment
- Cost-Effective Grey Investments

# Portfolio for Water as a Waste and a Resource



**Paerdegat Detention Facility**



**Staten Island Bluebelt**



**Catch Basins**



**Enhanced Tree Pit**

## Construction of Enhanced Tree Pit Transforms a Commercial Strip in Sutter Avenue, Brooklyn

June 2010



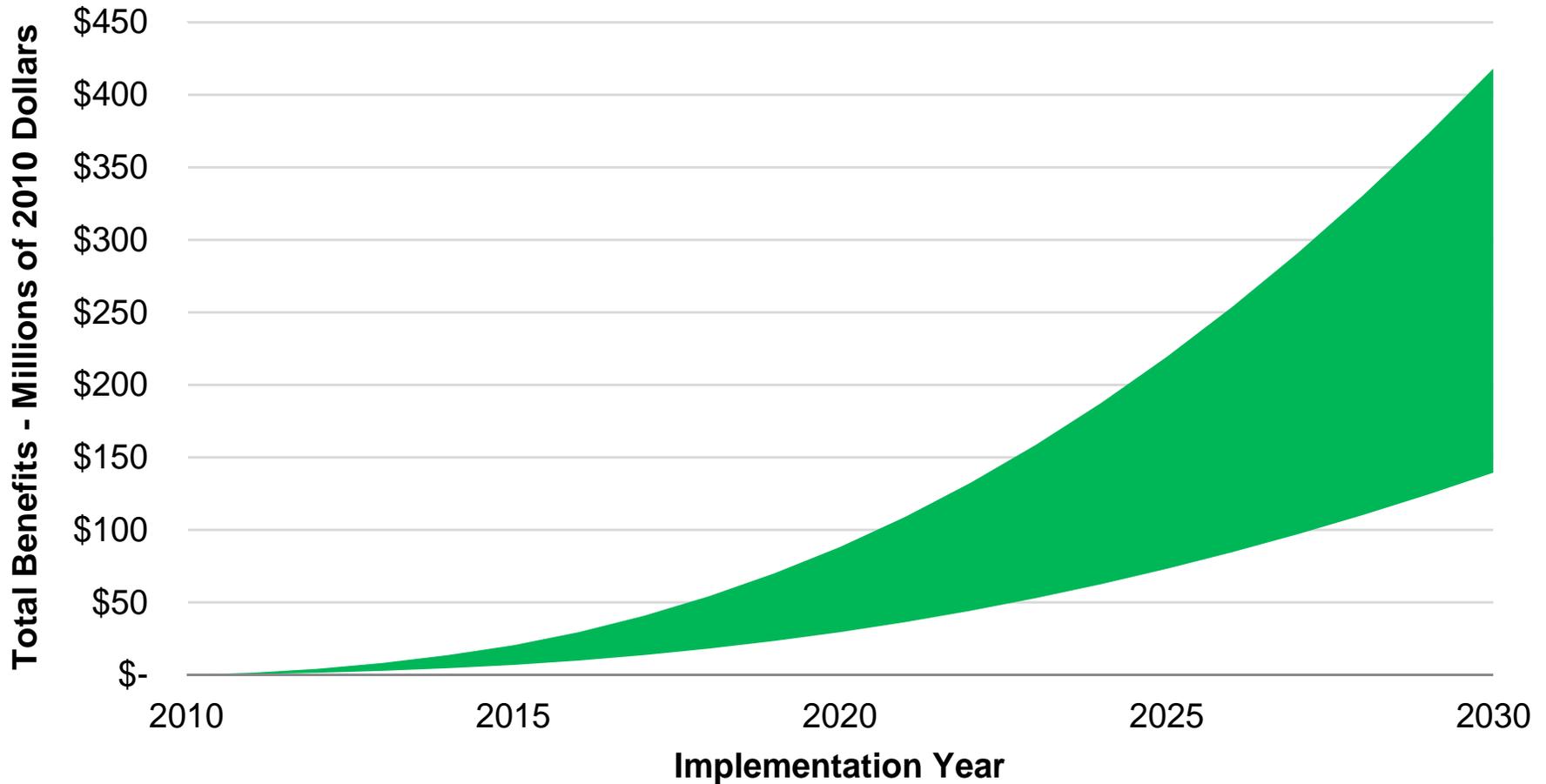
# Positive Co-Benefits of Green Infrastructure

## Annual benefits of green infrastructure per acre

Reduced energy demand:	\$5,513
Reduced carbon dioxide:	\$117
Improved air quality:	\$759
Increased property value:	\$4,725

## Acres of planted green infrastructure in 2030

25% planted green infrastructure	1,085 acres
75% planted green infrastructure	3,255 acres



Land Use	% of Combined Sewer Watershed
New development and redevelopment	5.0%
Streets and sidewalks	26.6%
Multi-family residential complexes	3.4%
Parking lots	0.5%
Parks	11.6%
Schools	1.9%
Vacant lots	1.9%
Other public properties	1.1%

- Targeted land uses representing 52% of our watersheds
- Expect that capture goal of 10% will be met by:
  - 1/3 New development standards
  - 1/3 Right-of-way projects
  - 1/3 Public facilities, parks, and other existing development



**109,500 Fire Hydrants**

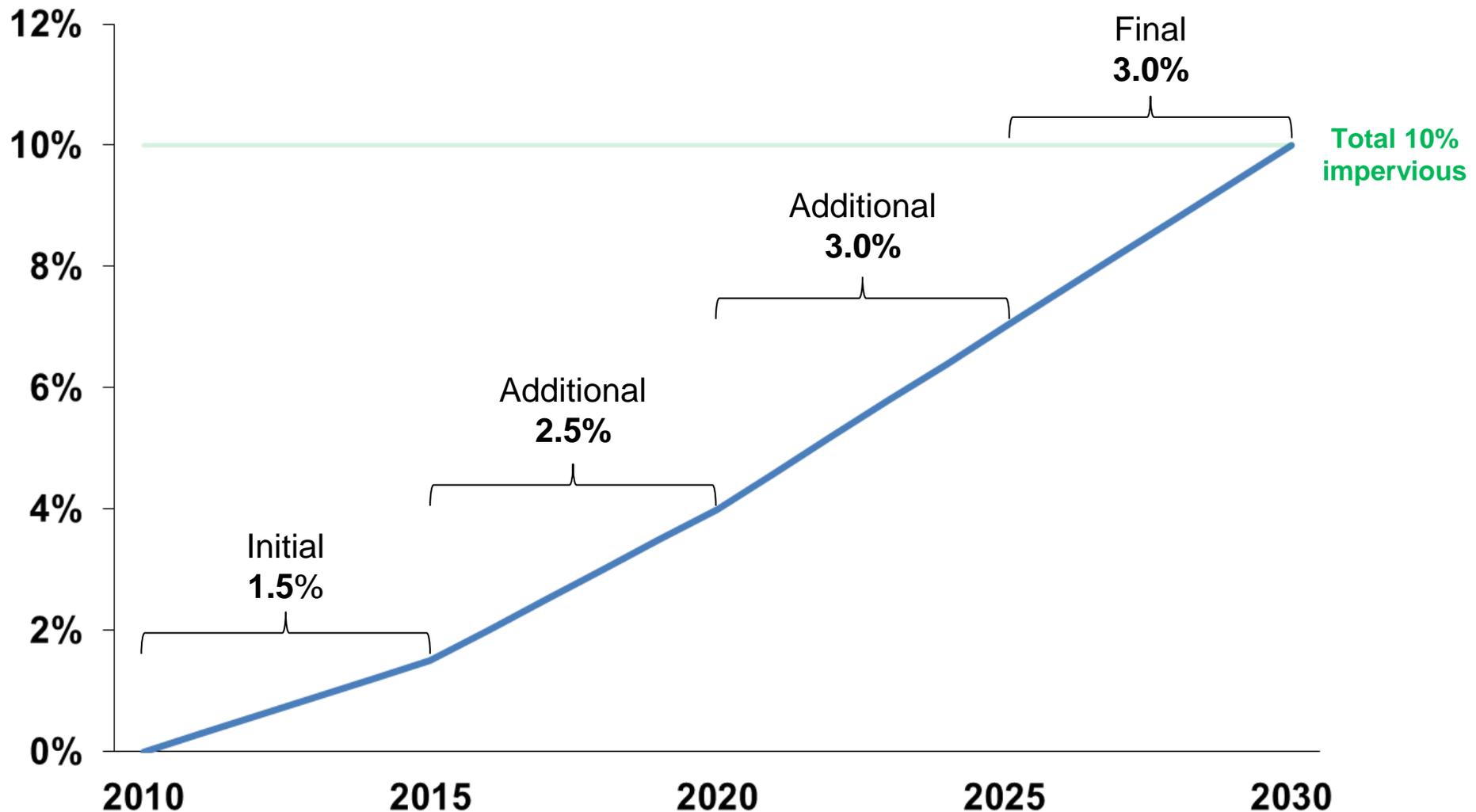


**144,000 Catch Basins**



**50,000 Enhanced Tree Pits & Swales?**

- **\$1.5 billion** in capital funding through 2029
- **\$187 million** in capital funds for FY12 to FY15



# Blue Roof Pilots



# Green Roof Pilots



# Right of Way Pilots



# Public Housing Demonstration Projects



Basketball Court

North Parking Lot

Community Center

South Parking Lot

- 1. Blue Roof
- 2. Shallow Bioretention/BioSwale
- 3. Porous Pavement
- 4. Storage Chambers
- 5. Perforated Pipe

0 50 100 250 Feet

- Installed green infrastructure pilots (over 30 to date)
- Created DEP Green Infrastructure Office
- Created interagency Green Infrastructure Task Force
  - Dept. of Buildings
  - Dept. of City Planning
  - Dept. of Citywide Administrative Services
  - Dept. of Cultural Affairs
  - Dept. of Design and Construction
  - Dept. of Education
  - Dept. of Transportation
  - Dept. of Parks and Recreation
  - Dept. of Housing & Preservation Development
  - Economic Development Corporation
  - Law Department
  - Mayor's Office of Long-Term Planning & Sustainability
  - NYC Housing Authority
  - Office of Management and Budget
  - The Trust for Governor's Island
- Reviewing over 400 capital projects for opportunities
- Implemented stormwater charge pilot

# Opportunities in Jamaica Bay & Tributaries

**Business  
Improvement Districts  
(SBS)**

**Planned Right-of-Way  
Projects (DOT)**

**Parks & Playgrounds  
(DPR)**

**Multi-Family Residential  
Housing (NYCHA)**

**Public Schools  
(DOE)**

**Community Gardens  
(DPR)**

Land Use	
	One & Two Family Buildings
	Multi-Family Buildings
	Mixed Residential and Commercial Buildings
	Commercial and Office Buildings
	Industrial and Manufacturing
	Transportation and Utility
	Public Facilities and Institutions
	Open Space and Outdoor Recreation
	Parking Facilities
	Vacant Land
	Drainage Area
	Planned ROW Projects
	Commercial Corridor
	Construction Permits 2000-2010
Existing Installations	
	Community Gardens w/ rainwater harvesting (9)
	Parking lots (1)
	ROW swales and tree pits (1)
	Rain barrels (15)
	Rooftops (4)



## Green Infrastructure Citizens Group

- Help DEP develop and implement the green infrastructure program by advising about project design, potential project locations, and stewardship
- Act as a liaison with community members

**Steering Committee** – will represent the interests of the Citizens Group including:

- Environmental Quality
- Environmental Justice
- Economic Development
- Design / Architecture
- Stormwater Management & Research

- Up to \$3,000,000 will be awarded in 2011
- Requirements:
  - Use green infrastructure to reduce or manage stormwater entering the combined sewer system
  - Be on (1) private property or (2) public sidewalks
  - Be completed within one year
  - Reduce impervious surfaces
  - Provide for long-term maintenance
- February 28, 2011, optional grant workshop
- April 1, 2011, application deadline

## Examples of Eligible Projects



## Preference will be given to projects that are:

- Cost effective
- Innovative and can be widely adopted
- Promote educational and community development
- Support economic growth and job creation
- Supported with matching funds

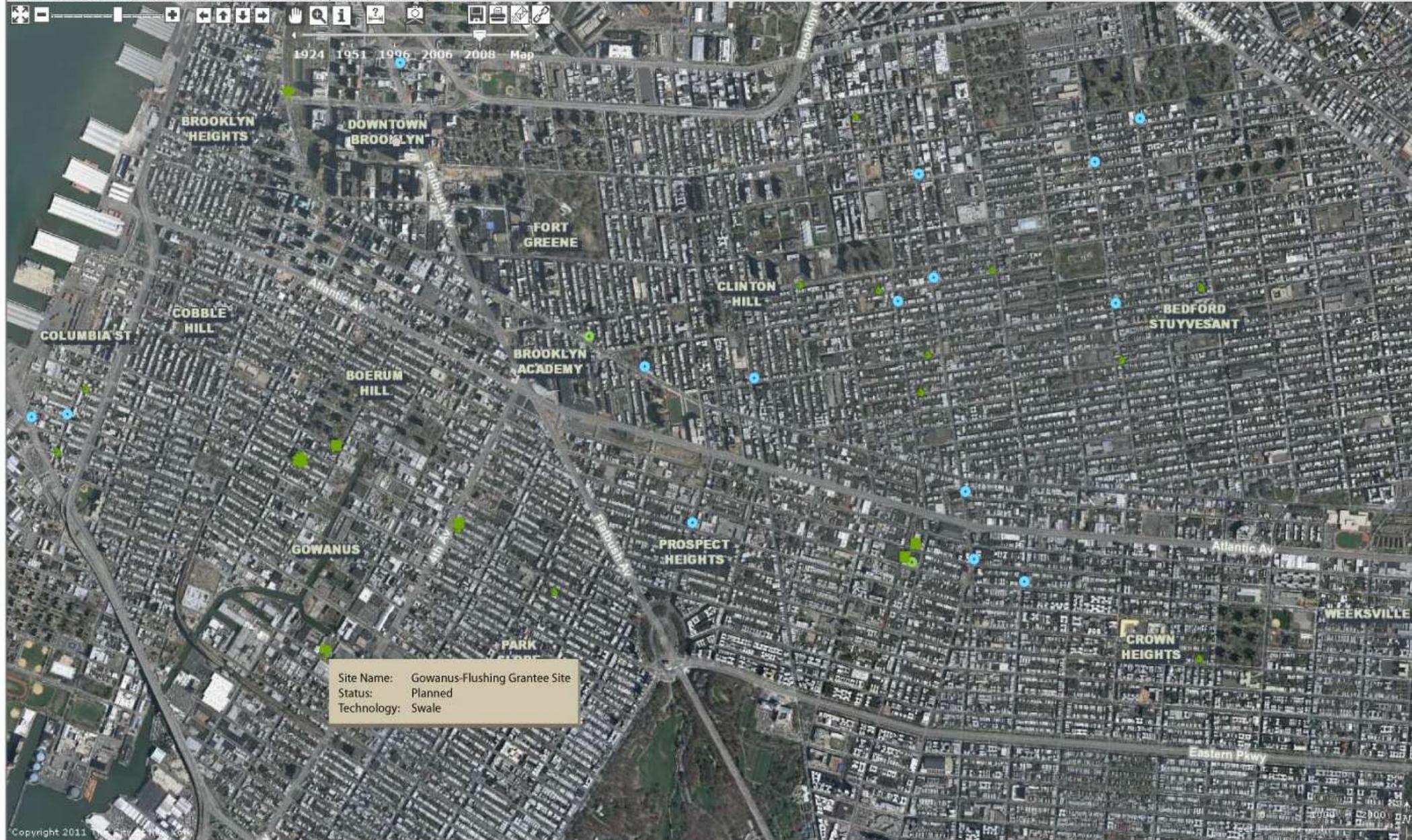
- DEP has been working with the public and stakeholders over the last three years to collect data about existing Green Infrastructure projects
- DEP has partnered with Department of Information Technology and Telecommunications (DOITT) to develop the Green Infrastructure Webmap Application

Phase	Steps	Timeline
Phase I	Display all known green infrastructure projects on citywide map with interactive information	Spring 2011
Phase II	Develop a mapping tool and form to allow stakeholders and public to add their own projects to the existing map	Fall/Winter 2011-12

# Green Infrastructure Webmap



NYCityMap | [FEEDBACK FORM](#) | [USER GUIDE](#) | [DISCLAIMER](#) | [BLOG](#)

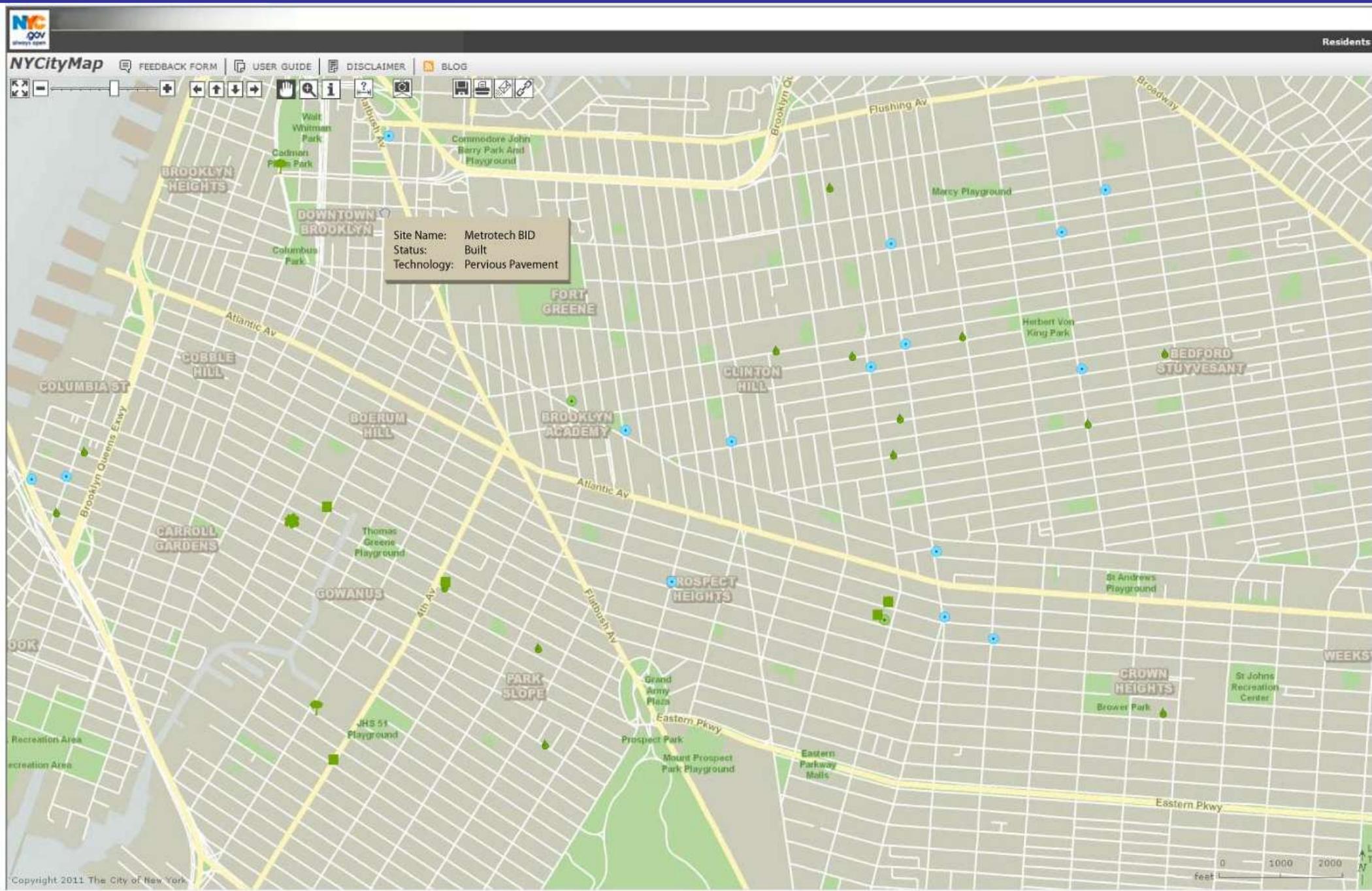


Site Name: Gowanus-Flushing Grantee Site  
Status: Planned  
Technology: Swale



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# Green Infrastructure Webmap



# Green Infrastructure Webmap



Site Name: Metrotech BID  
Status: Built  
Technology: Pervious Pavement

Please contact:  
[sustainability@dep.nyc.gov](mailto:sustainability@dep.nyc.gov)

The NYC Green Infrastructure Plan can be viewed at  
and downloaded from DEP's website:

[nyc.gov/dep/greeninfrastructure](http://nyc.gov/dep/greeninfrastructure)