NYC GREEN INFRASTRUCTURE
2015 ANNUAL REPORT

NYC Environmental Protection

Bill de Blasio
Mayor

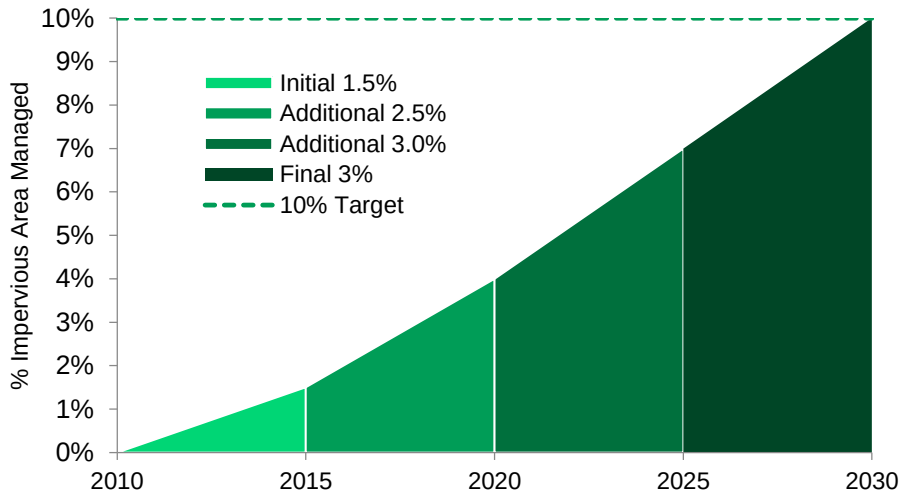
Emily Lloyd
Commissioner

Introduction

This 2015 Annual Report contains updates to the Department of Environmental Protection's (DEP) Green Infrastructure Program (the "Program") which includes retrofits to the City's streets and sidewalks, public property, private property through the Green Infrastructure Grant Program, maintenance and operations, and green infrastructure project tracking and asset management. It also provides updates on the impervious acres managed through 2015, estimated impervious acres to be managed through 2016, and Program funding. Previous Green Infrastructure Annual Reports and the Green Infrastructure Plan can be found on DEP's website here.

The goal of the Program is to reduce combined sewer overflows (CSO) by managing the equivalent of stormwater generated by one inch of precipitation on 10% of the impervious surfaces in the combined sewer tributary areas of New York City by 2030. The Order's incremental five-year milestones are shown in the table below.

Figure 1: Consent Order Milestones



Despite the extraordinary efforts expended by DEP (and its partner agencies) over the last four years, the total impervious acres managed do not accrue to 1.5% by 2015 in order to meet the first milestone.[1] However, DEP did exceed the commitment to spend $187 million on implementation of green infrastructure by December 2015 and demonstrated best efforts toward meeting the 1.5% milestone. DEP is developing a contingency plan in accordance with the Order that will propose a strategy to achieve the full 1.5% of impervious acres in a cost-effective way.

In addition to advancing design and construction of green infrastructure projects, in 2015 DEP also began a Research and Development Program (R&D) that will build on existing monitoring and substantially expand DEP's ability to collect new data on green infrastructure performance. The validated performance data will be integrated into the concurrent modeling and analysis effort to develop CSO volume reduction performance metrics for the Program. The results will provide equivalency rates for green infrastructure implementation (for example *X* volume of stormwater managed equals *Y* volume of CSO reduced) and

[1]Order on Consent (DEC Case No. CO2-20110512-25, modification to DEC Case No. CO2-20000107-8) http://www.nyc.gov/html/dep/html/cso_long_term_control_plan/index.shtml

will be submitted to DEC as the CSO Performance Metrics Report, also on June 30, 2016, in accordance with the Order. The Metrics Report will provide critical information about where the Program will contribute to water quality improvements and be cost-effective, and will be incorporated into the contingency plan to the extent possible.

Institutional Steps

Organizational Capacity

Office of Green Infrastructure and Partnering Agency Support

DEP's Office of Green Infrastructure (OGI) expanded in 2015 with four new staff, bringing the total staff to 25. OGI staff includes engineers, planners, project managers, and administrative support staff. The OGI maintained an aggressive pace towards meeting the Order requirements. DEP also funds full time staff at our partnering agencies who provide design review for Area-wide Green Infrastructure contracts ("GI contracts") at the Department of Transportation (DOT) and the Department of Parks and Recreation (DPR) Green Infrastructure Unit who designs parkland retrofits and reviews ROW designs.

Table 1: Office of Green Infrastructure and Partner Agency Staffing

	Total Headcount per Calendar Year	
Green Infrastructure Program	**2014**	**2015**
DEP Office of Green Infrastructure	21	25
DPR Green Infrastructure Unit (Design/Design Review Support)	3	3
DOT Office of Green Infrastructure (Design Review Support)	1	1
TOTAL	**25**	**28**

2016 ACTION ITEM: OGI is in the process of hiring 11 new positions to support the expanding design and construction work within the GI contracts and to provide additional support for construction oversight and inspection. In addition, the growing public property retrofit program will hire one additional position to increase capacity for interagency coordination and project identification.

Green Infrastructure Maintenance

Throughout 2015, DEP continued to provide maintenance for right-of-way green infrastructure practices in Brooklyn, Queens, and the Bronx. On July 1, 2015, DEP's Bureau of Water and Sewer Operations (BWSO) took the responsibility of right-of-way green infrastructure maintenance and began to lay out a comprehensive citywide maintenance plan for the right-of-way practices. This transition was smooth and no lapse in maintenance activities occurred.

Table 2: DEP Maintenance Staffing

	Total Headcount per Calendar Year	
Green Infrastructure O&M	**2014**	**2015**
BWSO Maintenance Program	15	23

Note: the Total Headcount includes both full-time and seasonal titles.

The maintenance of green infrastructure practices within publicly owned property is typically carried out by the owner agency, such as DOE's schoolyards. DEP has agreed to maintain the green infrastructure retrofits located on New York City Housing Authority (NYCHA) property.

2016 ACTION ITEM: The Maintenance Program plans to hire more staff in 2016 to provide sufficient maintenance for newly constructed Rain Gardens in the right of way (formerly known as "Bioswales"). BWSO will also work to finalize a maintenance manual, training curriculum for staff, and a facility plan.

Project Tracking and Asset Management

In 2015, DEP continued the development of *NYC GreenHUB*, a web-based application with data management capabilities that provides asset management for the thousands of green infrastructure practices citywide throughout their life cycle.[2] DEP has been developing, testing, and rolling out beta functionality for *NYC GreenHUB* and expects that the full system will be live in the summer of 2016. Once live, the system will be used by DEP staff, DEP design consultants, and other partnering agencies as a centralized hub for all green infrastructure data.

2016 ACTION ITEM: In 2016, DEP will roll out the GreenHUB program and will also complete an interdepartmental effort to integrate the Department's asset management programs so that information sharing can happen seamlessly. DEP will create a link on the DEP website to a map showing all constructed and planned green infrastructure practices.

Communication Strategies and Educational Activities

DEP takes all opportunities to educate and engage the public on each aspect of the Program. DEP continued engagement with residents and neighborhoods in coordination with the widespread construction activity in the GI contracts. DEP also continues to meet regularly with local elected officials, community boards, environmental organizations, and civic groups on many topics.

In 2015, DEP continued to convene the Water Infrastructure Steering Committee, which includes an expanded group of environmental stakeholders, environmental justice organizations, design and engineering professionals, community based organizations, and government entities including Region 2 of the US EPA and DEC. The Committee continued to meet periodically on critical DEP initiatives such as the Long-term Control Plans (LTCPs), Municipal Separate Storm Sewer System (MS4) permitting and resiliency planning. A list of DEP-led meetings and presentations related to the Program and held in 2015 is attached as Exhibit A.

[2] DEP tracks each individual green infrastructure practice, or "asset." Practices in the City include Rain Gardens in the right of way, and installations on public and private property including bioretention systems, permeable paving, subsurface retention systems or turf field s with infiltration capability, rainwater harvesting, and green and blue roofs.

The brochure and door hanger typically distributed during design and construction for GI contracts contain DEP's green infrastructure "hotline" phone number (718-595-6500), and an outreach email address (gioutreach@dep.nyc.gov).

In 2015, DEP added a new section to the website devoted to the Rain Gardens, our most common type of green infrastructure, so that the public can learn more about them and how they function. A link to that information is here.

DEP has also finalized a decal that will affix to the Rain Garden tree guard so that the public, other City agencies, and utility companies can identify them as Rain Gardens. In 2016, the decal design will proceed through the Public Design Commission process before the decals are installed (see mockup of installation in the photo below).

2016 ACTION ITEM: In 2016, the decal will be installed at all ROW green infrastructure practices. DEP is also planning to work closely with neighborhood and waterbody-specific community organizations to establish more formalized stewardship programs. Some of these groups have already begun to develop training and events. DEP will continue to support their efforts to participate in keeping the Rain Gardens clean and functioning.

Regulatory and Rulemaking Activities

In 2015, DEP and DOT moved forward to protect constructed right-of-way (ROW) green infrastructure by adding a stipulation to the DOT's Street Opening Permits. DEP began a monthly data share with

DOT so that these protection requirements are included in all Street Opening Permits for blocks that contain a green infrastructure practice. The protection requirements are posted online here and detail the measures contractors must take to prevent damage to DEP's ROW practices.

Previous Annual Reports describe the Green Roof Tax Abatement and the Parking Lot Stormwater Charge Pilot Program and can be found on DEP's website here.

2016 ACTION ITEM: In 2016, DEP expects to promulgate a rule change clarifying DEP's authority to disperse grants to private property owners and another rule clarification of DEP's enforcement authority for illegal dumping/discharge into Rain Gardens. And as it relates to policymaking activity, DEP will embark on an in-depth analysis on how to incentivize green infrastructure for private property owners in a variety of circumstances (e.g., retrofits, credit programs, with redevelopment) in partnership with the Natural Resources Defense Council (NRDC).

Green Infrastructure Standard Designs

In 2015, OGI continued to update the *Standards for Green Infrastructure* in order to adapt to commonly-encountered field conditions. OGI introduced a new, narrower Right-of-Way (ROW) green infrastructure practice called the ROW Greenstrip. DEP developed these practices to accommodate limited space in the field due to subsurface conditions and sidewalk width limitations.

The latest standard design drawings are available on DEP's website here.

2016 ACTION ITEM: DEP will finalize design guidelines for ROW Stormwater Greenstreets and On-site Practices in 2016. Design consultants can reference these guidelines for preferred details and design best practices. This is expected to improve the efficiency of the site-specific design process.

Citywide Implementation

In 2015, DEP created a web-based map for viewing the Program's GI contracts and constructed GI assets. The map shows each practice's location and status, and has served as a very useful tool for DEP staff and staff at other City agencies. In 2016, DEP released a publicly accessible version of the web-map showing all green infrastructure practices with advanced designs, in construction, or constructed. The map can be found on the DEP website here and will be updated automatically on a monthly basis.

To meet the green infrastructure goals of the Order, DEP has identified Priority Areas based on several criteria, such as CSO volume and frequency, projected benefits of projects constructed through DEP's Waterbody/Watershed Facility Plans,[3] or other planned system improvements. DEP also notes outfalls in close proximity to existing and future public access locations. DEP continues to review and expand the Priority Areas to ensure sufficient green infrastructure implementation to meet the 2030 goal set forth in the Order.

[3] For more information on Waterbody/Watershed Facility Plans (WWFPs), visit www.nyc.gov/html/dep/html/cso_long_term_control_plan/index.shtml

Green Infrastructure Built/Planned Table

The updated Built and Planned Green Infrastructure table is below. These tables show the impervious acres managed and percent of acres managed per waterbody through 2015 and the planned acres for 2016-2017. The acres managed represent all projects with final designs, those in construction, and those that are constructed.

The table reflects the progress DEP has made in 2015 and projects further progress based on planned projects through 2017. The table sums the acres managed by "Total Waterbodies" without East River/Open Waters, and the acres managed by "Total Citywide," which includes East River/Open Waters.[4] By 2017, DEP is reporting that 2.3% impervious area will be managed in the Priority Waterbodies, and that over 1.5% will be managed citywide in 2018. As mentioned above, DEP intends to submit a contingency plan for the 1.5% milestone.

While green infrastructure contracts are underway for parts of the East River/Open Waters watershed, DEP has prioritized and initially invested the majority of its resources for green infrastructure in priority combined sewer areas tributary to waterbodies that do not comply with existing water quality standards. By implementing the Program in this manner, DEP hopes to achieve CSO reductions and real water quality benefits from the projects and either remove or limit the reliance on grey infrastructure in these areas. DEP anticipates that the CSO reductions from green infrastructure implementation in the priority waterbodies should have a greater effect on water quality improvements, which coincides with the objectives of DEP's Long-term Control Plans.

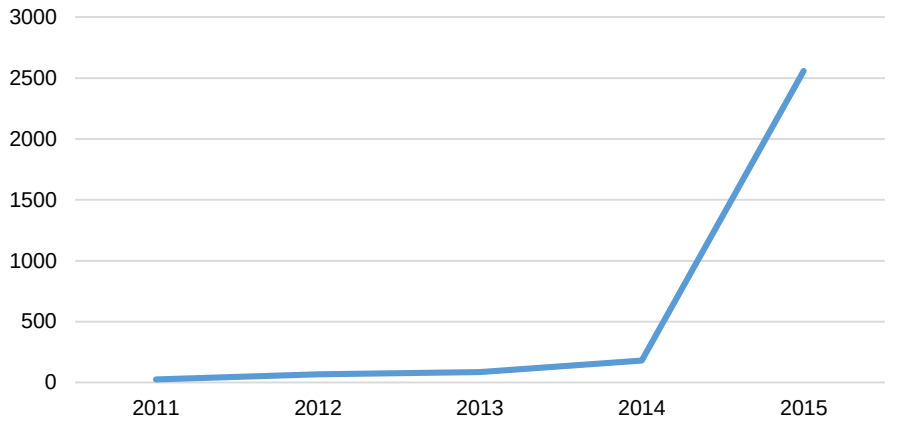
As discussed in the Adaptive Management section below, DEP continues to expand its tool box and strategies to work around the various physical and operational challenges to implement the GI Program. Physical limitations such as poor soils, high groundwater and bedrock, space constraints in the right of way, conflicting capital projects, environmental conditions, and other constraints are common throughout the City and in some cases may preclude green infrastructure implementation. Operationally, staff increases and the constant interagency coordination assist in the strong rate of implementation and efficiency even though the milestones for the rate of GI development in the Order may not be met. Nevertheless DEP continues to advance the development of green infrastructure in the City with significant successes but acknowledges that the Program will be a long-term endeavor. The Order includes adaptive management principles and rightly provides for contingency planning to address these challenges and make course corrections.

[4] The waterbodies included in East River/Open Waters watershed, namely the East River and Hudson River, already meet the existing water quality standards and are cleaner than they have been in a century due to extensive investment by DEP in grey infrastructure improvements.

Right of Way Area-wide GI Contracts

In 2015, many of the GI contracts were constructed or are under construction in Brooklyn, Queens, and the Bronx. The map linked above shows the extent of ongoing work. Construction activity peaked in 2015 in several GI contracts and more than 1,000 practices were constructed and another 1,500 were substantially completed (i.e., still under contract guarantee but planted and functioning). The table below shows the exponential increase in the number of ROW practices from 2011 to 2015.

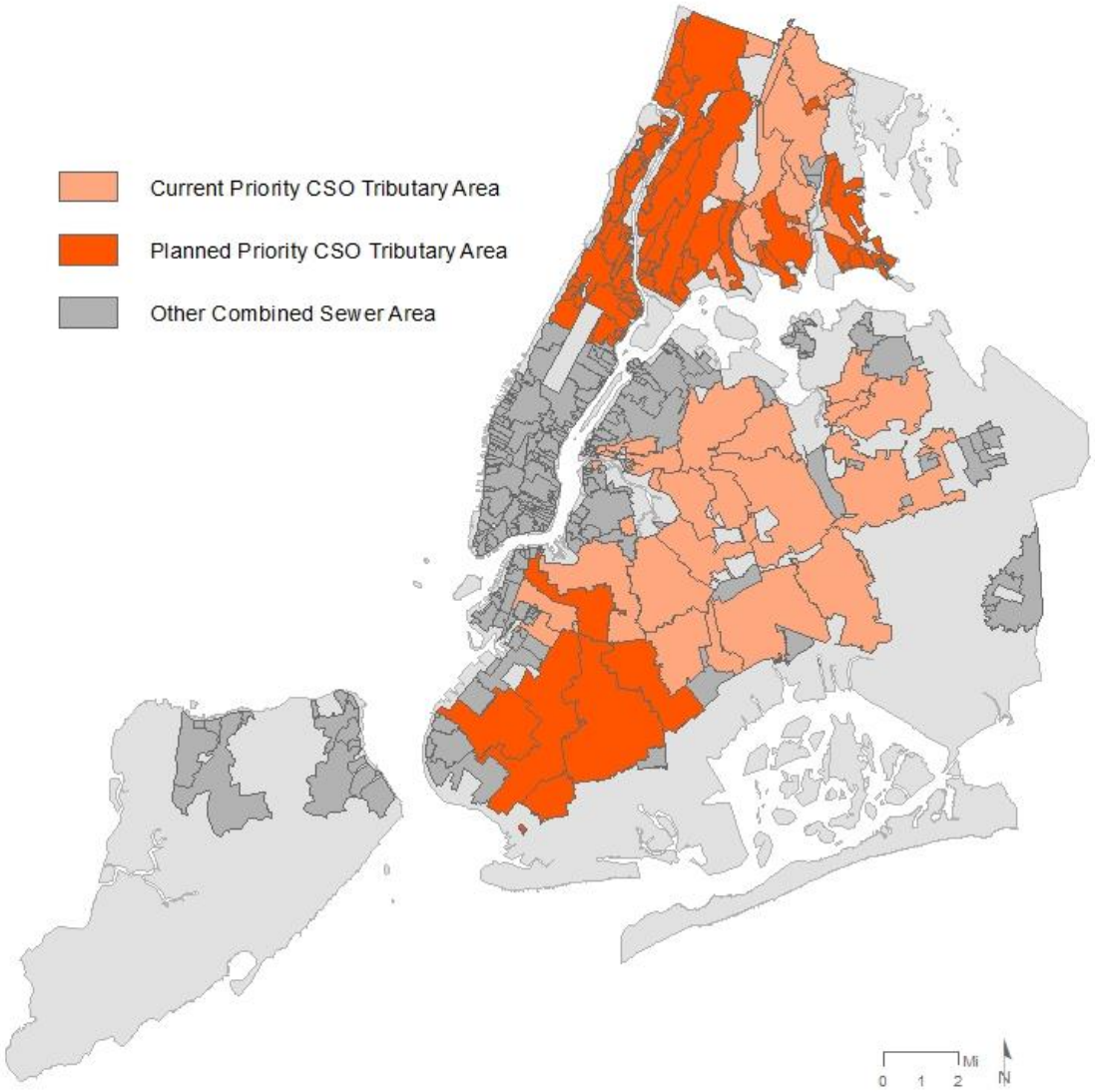
Figure 2: Increase in Right of Way Green Infrastructure Practices



Detailed description of the Area-wide contract strategy and the design and construction process are described in previous Annual Reports. Photos of right of way green infrastructure construction can be found on DEP's website here.

2016 ACTION ITEM: In 2016, three new large GI contracts will begin design within the Flushing Bay, Bronx River, and Jamaica Bay CSO Tributary Areas. Construction is expected to begin rolling out in 2017 for those areas.

Map 1: Current and Future Area-wide GI contracts



Public Property Retrofits

In 2015, DEP initiated design on over 100 publicly owned properties, and has identified approximately 150 more to begin design this year. These projects will advance design through 2016 and construction is expected to start in 2017 and continue as more projects are added to the pipeline. This area of the Program takes more time to properly implement and requires alignment of multiple interests and priorities at each property. Nonetheless, DEP and agency partners are making headway on dozens of retrofits and are working to create streamlined processes in order to get the projects installed in a timely manner. DEP is coordinating this work with DPR, Department of Education (DOE), Department of Design and Construction-Public Buildings (DDC), and the NYC Housing Authority (NYCHA). A list of public property retrofits underway and their status is attached as Exhibit B and photos of constructed projects can be seen here.

As part of this effort, DEP has partnered with the not-for-profit Trust for Public Land (TPL), SCA, and DOE since 2011 to renovate schoolyards into green infrastructure neighborhood playgrounds. In 2015, DEP and TPL continued this partnership and successfully completed design of two playground sites, initiated design of eight sites, began construction of one site, and completed construction of one site. See Exhibit C for a list of these sites and the link here for before and after photos on the six completed projects.

As reported last year, in 2014 DEP committed $36 million towards green infrastructure construction as part of the new Community Parks Initiative (CPI) launched by DPR. In CPI Phase 1, DPR will reconstruct and add green infrastructure to 29 parks in their target areas, 24 of which are within combined sewer areas. In 2015, DPR announced a second phase of CPI in which an additional 32 sites will be reconstructed. As part of CPI Phase 2, DEP committed an additional $14 million towards green infrastructure construction at these sites. 29 of the Phase 2 sites are in combined sewer areas. By the end of 2015, DEP and DPR completed the green infrastructure design for 29 sites in Phase 1. See Exhibit D for a list of the CPI Phase 1 and Phase 2 sites.

2016 ACTION ITEMS: In 2016, DEP and NYCHA will finalize a revised agreement that will facilitate the partnership and several more projects in the coming years. DEP and DDC's Public Buildings unit will increase the number of projects evaluated for incremental green infrastructure opportunities.

DEP and partner agencies expect to initiate retrofit construction contracts on 20 DOE school sites and 20 DPR sites. In 2016 DEP also plans to initiate site analysis on 65 DOE, DPR and NYCHA sites under GI contracts in the Bronx River, Westchester Creek, and the Jamaica Bay watersheds. Finally, the green infrastructure partnership with TPL anticipates initiating design on 10 playground sites, completing design of eight sites, beginning construction on three sites, and completing construction at three sites.

Construction of CPI Phase 1 sites is expected to begin in fall 2016, and DEP will continue to collaborate on the CPI program through Phase 2.

Green Infrastructure Grant Program

Since its introduction in 2011, the Grant Program has sought to strengthen public-private partnerships and public engagement in regards to the design, construction and maintenance of green infrastructure on private property in combined sewer areas. To date, the Grant Program has committed more than

$13.5 million to 31 private property owners to build green infrastructure projects. In 2015, two projects started construction and six others were completed. Also in 2015, DEP transitioned the Grant Program application process from a single annual submission date to a year-round, open application process. Grantees can now apply at any time during the year. The Grant Workshop schedule for 2016 is posted to the DEP's website here as well as the workshop presentation and contact information for pre-submission meetings.

Photos of planned and constructed grant projects are located here. The current list of projects is appended as Exhibit E.

2016 ACTION ITEM: DEP expects six grant projects to be constructed in 2016. Ongoing Grant Program administration will continue including quarterly grant workshops, pre-submission meetings upon request, and additional outreach to property owners in Priority CSO Tributary Areas.

Table 3: Built and Planned Green Infrastructure and Impervious Acres Managed

Waterbodies	Impervious Area within Combined Sewer Tributary, IACS (ac)	10% of IACS Tributary (ac)	1.5% of IACS Tributary (ac)	2010-2014		2015		Total 2010-2015			Total 2010-2017	
				Built		Built / In Construction[1]		Number of Assets	Total IACS Managed (ac)	Total Percent of IACS Managed	Total IACS Managed (ac)	Total Percent of IACS Managed
				Number of Assets	IACS Managed (ac)	Number of Assets	IACS Managed (ac)					
Alley Creek	1,490	149	22	0	0	0	0	0	0	0.0%	0	0.0%
Bronx River*	2,331	233	35	42	11	47	14	89	25	1.1%	50	2.2%
Coney Island Creek	694	69	10	0	0	0	0	0	0	0.0%	0	0.0%
Flushing Bay*	4,049	405	61	193	21	813	92	1,006	113	2.8%	115	2.8%
Flushing Creek*	5,923	592	89	13	2	65	7	78	9	0.2%	158	2.7%
Gowanus Canal*	1,387	139	21	29	4	82	5	111	9	0.7%	9	0.7%
Hutchinson River*	1,128	113	17	22	1	183	24	205	26	2.3%	27	2.4%
Jamaica Bay & CSO Tributaries*	7,891	789	118	57	8	870	92	927	100	1.3%	341	4.3%
Newtown Creek*	4,524	452	68	25	3	1,286	107	1,311	110	2.4%	143	3.2%
Paerdegat Basin	4,725	473	71	4	0	0	0	4	0	0.0%	0	0.0%
Westchester Creek*	3,480	348	52	3	0	0	0	3	0	0.0%	22	0.6%
Total Waterbodies	**37,622**	**3,762**	**564**	**388**	**50**	**3,346**	**342**	**3,734**	**392**	**1.0%**	**865**	**2.3%**
East River & Open Waters (ER/OW)	41,127	4,113	617	58	25	38	20	96	46	0.1%	236	0.6%
Total Citywide[2]	**78,749**	**7,875**	**1,181**	**446**	**75**	**3,384**	**362**	**3,830**	**437**	**0.6%**	**1,101**	**1.4%**

** Priority CSO Tributary Areas*
[1] Projected sites that will either be: 1) constructed or 2) registered with the Comptroller's office with a Notice to Proceed
[2]Total Waterbodies plus ER/OW

Stormwater Performance Standard

DEP has committed to tracking new Site Connection Proposals (SCPs) and House Connection Proposals (HCPs) submitted to DEP that have been affected by the Stormwater Rule.[5] Since the rule took effect in 2012, DEP has certified more than 5,300 SCPs/HCPs and, of that, more than 678 sites were affected by the Stormwater Rule. In 2015, 438 sites were affected by the Rule, comprising of more than 223 acres of contributing drainage area.

Tables 4 and 5 present the breakdown of stormwater management types employed by applicants affected by the rule in 2015. These systems are primarily detention-based and designed to meet the reduced 0.25 cubic feet per second stormwater release rate or 10% of the allowable flow, whichever is greater.

Tables 4 and 5: Stormwater Rule Summary

Table 4 - SCP/HCP'S Affected by stormwater rule by Borough, 2015

Borough	# of HCPs/SCPs
Manhattan	119
Bronx	66
Brooklyn	160
Queens	89
Staten Island	4
Total	**438**
Contributing Drainage Area (Acres)	223

Table 5 - SCP/HCP's Planned and Constructed by Structure Type, 2015

Structure Type*	Planned			Connection Constructed**		
	Primary Structure	Other Structure	Total Planned	Structure(s)	Other Structure	Total Constructed
Bioswale	0	0	0	0	0	0
Blue Roof	144	47	191	13	4	17
Drywell	12	5	17	1	0	1
Perforated Pipe	7	0	7	0	0	0
Tank	234	16	250	21	2	23
Storm Chamber	5	5	10	1	0	1
Total	**397**	**68**	**465**	**35**	**6**	**41**

** Note: Sites may proposed more than one structure type (e.g.: Blue Roof and Tank)*
*** Constructed connections are those where DEP has permitted and inspected the installation of the certified/self-certified sewer connection, and whatever structure that may have been required pursuant to the approved or self-certified SCP/ HCP is assumed to be installed/constructed.*

[5] DEP's Stormwater Rule tracking does not include SCP/HCPs certified by the Department of Buildings (DOB); hence, the Stormwater Rule may affect additional sites. More information on the Rule is located here: http://www.nyc.gov/html/dep/html/stormwater/stormwater_management_construction.shtml

2016 ACTION ITEM: As part of the CSO Performance Metrics, DEP will develop a calculator that will create an equivalency rate for detention systems constructed under the Stormwater Rule so that the projects can be credited toward the Consent Order milestones.

Green Infrastructure Program Budget

Capital Funding

Capital funding covers costs such as site selection, design, construction, and construction management for green infrastructure projects. As of December 2015, the Program has now encumbered over $260 million with another $925 million budgeted over the next 10 years.[6] This capital funding will support green infrastructure contracts undertaken by DEP and agency partners, including the Area-wide contracts, the Grant Program, TPL partnership projects, and retrofit projects with other City agencies.

Table 5: Capital Funding Encumbered and Budgeted

Fiscal Year	Encumbered Capital Funding
FY12	$9,015,345
FY13	$15,202,880
FY14	$152,935,549
FY15	$58,041,000
FY16[1]	$23,689,957
TOTAL	**$258,884,731**

Fiscal Year	Approved FY 2017 Preliminary Capital Improvement Program
FY16[2]	$163,784,684
FY17 - FY25	$753,435,000
TOTAL	**$917,219,684**
PROGRAM GRAND TOTAL[3]	**$1,176,104,415**

[1]FY16 Encumbered to date
[2]FY16 Remaining
[3]Estimated total is based on the total encumbered and the Approved FY17 Preliminary Four-Year Plan, and the Approved FY16 Executive Ten-Year Plan.

[6] As part of the initial 2015 Order milestone, DEP agreed to encumber $187 million toward the implementation of green infrastructure by December 31, 2015, and has met this commitment.

Expense Funding

The Program's approved and proposed expense budget through FY17 is $40 million, which covers operational costs, such as maintenance of green infrastructure, office and field staff, materials, equipment, and other non-capitally eligible programmatic needs. The increased budget in FY16-FY18 reflects DEP's plan for the new maintenance staff, materials, vehicles, and facilities as well as increased program support going forward.

Table 6: Expending Funding Expended and Budgeted

Fiscal Year	Expense Funding (Actual Expended)
FY12	$615,295
FY13	$3,269,689
FY14	$3,892,778
FY15	$4,151,148
FY16	$14,159,022
TOTAL	**$26,087,932**

Fiscal Year	Approved and Proposed Expense Budget
FY17	$15,689,670
FY18	$18,461,611
TOTAL[1]	**$34,151,281**

[1]*At the time of this publication, the OGI Expense Budget for FY17-FY18 has not been approved by the Mayor's Office of Management and Budget. Proposed costs are pending and should not be considered final.*

Adaptive Management Strategies and Lessons Learned

Adaptive management allows for course corrections and refinement of goals based on actual results and lessons learned. DEP continues to consider results and lessons learned to date from field conditions, procurement and construction timelines, monitoring results, and costs. Additionally the R&D Program will support adaptive management within the Program through extensive data collection and analysis and is described in more detail below. Once the R&D Program's initial monitoring results are finalized, DEP will include them and any implications for the Program in future Annual Reports.

Green Infrastructure Research and Development Program

In 2015, DEP kicked off a $10 million dollar, five-year comprehensive R&D Program to provide support by collecting crucial performance and co-benefit data through an extensive long-term monitoring effort. The R&D Program will support DEP's Program by reviewing performance over time, ensuring performance based maintenance and operations, and conducting cost-benefit analyses of various green infrastructure designs. In addition, the scope of work will support DEP's development of LTCPs and other water quality related compliance documents, fill data gaps DEP has identified through previous green infrastructure monitoring activities, and review DEP's current modeling framework for

calculating co-benefits. DEP will then be able to incorporate this work into the overall Program planning and implementation.

The R&D Program is also supporting the development of the Green Infrastructure CSO Performance Metrics report. The report will include in-depth analysis of existing monitoring data, represent all built and planned projects, and establish a green infrastructure modeling methodology that reflects the Office of Green Infrastructure's typical project types and implementation strategy.

Concurrently, DEP has begun to draft the green infrastructure monitoring protocol which will include over 24 research topics, each to be investigated through numerous experiments for multiple types of green infrastructure practices being implemented under varying environmental conditions. Ultimately the data collected will be used to evaluate and make recommendations for the Program at multiple scales and in various conditions. In early 2016, DEP peer reviewed the protocol and summarized at a public meeting.

Examples of scientific data collection, analyses, and/or other technical research that may be included:

- Quantify stormwater inflow, outflow, infiltration, and evapotranspiration
- Monitor engineered soil mixes for optimal infiltration rates, stormwater capacity, and plant growth
- Study stormwater lateral infiltration
- Monitor green roofs and growing media types
- Assess performance and sediment removal
- Recommend optimal vegetation selection based on stormwater management and ecological goals
- Monitor multiple tree species' water uptake/evapotranspiration rates
- Review and advise on maintenance practices, levels of effort, and thresholds for performance
- Evaluate design and construction costs for built green infrastructure practices
- Quantify potential green infrastructure co-benefits or sustainability metrics, including temperatures and cooling effects of vegetated green infrastructure practices
- Review existing and new technologies that can maximize stormwater retention
- Review existing and develop new innovative modeling algorithms to capture the performance of green infrastructure elements at various spatial scales

In 2015, the R&D Program also began to analyze the costs to design and construct green infrastructure projects, and to evaluate and advise on appropriate maintenance practices and protocols. Updates on these efforts will be included in the 2016 Annual Report.

2016 ACTION ITEM: In 2016, DEP will finalize the R&D monitoring protocol and peer-review, the CSO Performance Metric Report and the contingency plan. The 2016 Annual Report submitted in April 2017 will include any major findings of these reports and early monitoring results, as available, with other adaptive management-related updates.

Program Implementation Challenges and Lessons Learned

By and large, the challenges DEP faces in siting green infrastructure dictates the application rates in any given CSO tributary area. The siting criteria that are applied to all areas yield a different number of available sites due to the unique characteristics of each neighborhood. Key implementation lessons learned to date are summarized below. This list was included in last year's 2014 Annual Report but remains very relevant to the Program. DEP continues to develop solutions to common siting obstacles.

In the ROW:

Street conditions - Siting challenges include existing trees, street furniture, residential driveways, bus stops, building entrances, loading zones, underground/overhead transit lines, and others.

- In response, DEP has collaborated with DOT and DPR to develop standardized siting criteria, which ensures that all sites meet safety requirements for traffic, transit, and pedestrians, and minimize impacts to existing street trees.

Subsurface conditions - In many areas across the City, high bedrock, high groundwater, clay-rich soils, and existing contamination can limit opportunities for siting green infrastructure.

- In response, DEP's environmental and geotechnical standards ensure that all green infrastructure will function properly and not create public concern.

Utility conflicts - Existing overhead/underground utilities can interfere with green infrastructure siting, and can present hazards during geotechnical testing.

- In response, DEP's rigorous procedures, oversight, and accountability in the field minimize utility interference. DEP developed a standard Pre-Drilling Checklist to make sure that the contractor performed all due diligence.
- In response, DEP developed design standards for protecting private service lines that run through green infrastructure installations in the right-of-way and coordinates with utility companies to relocate utility facilities as necessary.

Other ROW Construction – construction by other utilities in the right-of-way have caused damage to constructed green infrastructure practices and those in construction

- In response, DEP provides a list of all right-of-way green infrastructure practices to the DOT Street Permitting group. The DOT street opening permits have been updated include language to protect all nearby green infrastructure.

Private property construction – Scaffolding, construction fences, and other equipment associated with private property development adjacent to right-of-way green infrastructure may limit accessibility to the site.

In response, DEP is providing all proposed right-of-way green infrastructure locations to DOB so that green infrastructure construction may be coordinated with private property development

On Public Properties:

DEP's public property site screening process begins with GIS mapping and desktop analysis of all potential retrofit sites within a targeted area. Sites are screened in coordination with the owner agency against existing capital plans and other property records. Screened sites then undergo a comprehensive site analysis, which involves review of existing agency records and as-built drawings, and a site walkthrough with the owner agency to identify all possible retrofit opportunities. Sites passing this stage then proceed to geotechnical investigation of each potential retrofit location to determine the feasibility of stormwater infiltration into the existing soil. Sites deemed feasible are then able to proceed with retrofit design.

While the above steps are not all physical challenges, it does take considerable time and effort to evaluate each property and determine if the project can move ahead. The screening process ensures a thorough site analysis to confirm the physical suitability for green infrastructure at each site.

Typical physical challenges for implementing public property retrofit projects include incompatible site uses or programming needs, presence of hazardous materials, underground vaults, planned capital improvements, poor soil conditions, and other conflicts. Often times a green infrastructure retrofit cannot proceed due to extensive disrepair of a site or buildings that requires matching funds which are not available.

2016 ACTION ITEM: DEP remains committed to maintaining productive working relationships with all our City agency partners to eliminate barriers in order to implement the program.

Permeable Pavement Pilot Project

In 2013, the New York City Council passed Local Law 80 of 2013 requiring DEP and DOT to embark on a study of three permeable pavement installations in the City's streets and sidewalks. In 2014, the agencies worked together to identify pilot locations in the Hutchinson River and Flushing Bay Priority Areas, and developed the monitoring protocol. Due to siting limitations, DOT has rejected several potential locations and is considering options for the third pilot area.

In early 2015, DEP installed rain gauges and pipe flow monitors to collect rainfall information and combined sewer flow data, respectively, to establish the pre-construction conditions in the two pilot areas. In late 2015, DEP and DOT finalized the design for the porous concrete panels that will be installed in the street parking lanes throughout these locations.

2016 ACTION ITEM: Finalize new porous paving streets area and begin construction on the first two pilot areas in summer 2016. Following installation, DEP will collect post-construction monitoring data to quantify the performance of the porous concrete panels. DEP will also monitor the performance of the panels over time and evaluate various maintenance methods. DEP and DOT will submit study findings to the City Council in 2018.

EXHIBIT A – 2015 Meetings and Presentations

2015 Quarter	Date	Community Members	Type of Outreach	Approximate Attendees
Q1	1/7/2015	Chinese Community Center of Flushing	GI Tour	5
Q1	1/14/2015	Brooklyn Community Board 8 staff	Meeting	1
Q1	1/15/2015	Queens Community Board 3	Meeting	50
Q1	1/28/2015	Automotive Realty Group	Meeting	3
Q1	2/24/2015	Brooklyn CB 8 & Prospect Heights Neighborhood Council	Presentation	25
Q1	2/26/2015	CCNY class	Presentation	20
Q1	3/3/2015	Open Sewer Atlas	Meeting	3
Q1	3/4/2015	Brooklyn Community Board 8 staff	Meeting	1
Q1	3/11/2015	Administrators at Brooklyn Sch. for Global Studies, P.S. 39, John Jay H.S.	Meeting	4
Q1	3/17/2015	East Brooklyn BID	Presentation	40
Q1	3/24/2015	Bronx Community Board 12	Presentation	3
Q2	4/1/2015	Brooklyn Community Board 2	Presentation	35
Q2	4/3/2015	Brooklyn Community Board 8 staff	Meeting	1
Q2	4/8/2015	Queens Community Board 5	Presentation	35
Q2	4/14/2015	Queens Community Board 4	Presentation	75
Q2	5/12/2015	Councilmember Lander meeting	Meeting	2
Q2	5/18/2015	Bronx Community Board 11	Presentation	11
Q2	5/19/2015	Brooklyn Community Board 16	Presentation	1
Q2	5/19/2015	Brooklyn Community Board 5	Presentation	1
Q2	5/20/2015	Park Place Underhill Avenue Block Association	Meeting	25
Q2	5/28/2015	Expo Gowanus	Presentation	100
Q2	6/4/2015	Queens Community Board 2	Presentation	120
Q2	6/10/2015	P.S. 111M Opening Ceremony	Presentation	200
Q2	6/15/2015	Brooklyn Community Board 17	Meeting	10
Q2	6/16/2015	Green Infrastructure Summit	Presentation	25
Q2	6/18/2015	S.W.I.M. Public Meeting	Meeting	20
Q2	6/23/2015	Gowanus Canal Conservancy Bioswale Maintenance	Meeting	20
Q2	6/25/2015	C.S. 300X Opening Ceremony	Presentation	250
Q3	7/8/2015	Green Infrastructure Grant Workshop, Manhattan	Presentation	40
Q3	7/9/2015	Grey to Green Advisory Committee	Meeting	15
Q3	7/21/2015	Fifth Avenue Committee/Gowanus Canal Conservancy	Meeting	8
Q3	9/8/2018	Green Infrastructure Grant Workshop, Brooklyn	Presentation	15
Q3	9/9/2015	Brooklyn Borough Service Cabinet	Meeting	30
Q3	9/17/2015	Water Infrastructure Steering Committee	Presentation	18
Q3	9/23/2015	Green Infrastructure Grant Program Roundtable	Meeting	5
Q3	9/24/2015	Pratt Design Class	Presentation	10
Q3	9/25/2015	Urban Innovation for Livable Cities Conference	Presentation	30
Q4	10/7/2015	Cities Alive Design Charrette, Manhattan	Presentation	25
Q4	10/8/2015	Borough Budget Consultations, Queens	Meeting	15
Q4	11/6/2015	S.W.I.M. Public Meeting	Meeting	30
Q4	11/13/2015	Greentech Investors Forum	Presentation	10
Q4	12/2/2015	Green Infrastructure Grant Workshop, Manhattan	Presentation	40

EXHIBIT B – Public Property Retrofits

	Site Name	Status	Actual/Projected Completion Date
Parks (DPR)			
1	Houston Playground	Constructed	Fall 2013
2	Powell Playground (Shiplacoff Playground)	In Construction	Spring 2016
3	Forest Park- Overlook Area/Park Lane	In Construction	Spring 2016
4	Edenwald Playground	In Construction	Fall 2018
5	P.O. Nicholas Demutiis Park	Design Complete	Fall 2018
6	Watson Gleason Playground	60% Design	Fall 2018
7	Benninger Playground	Schematic Design	Fall 2018
8	Carroll Park	Schematic Design	Fall 2018
9	Ehrenreich-Austin Playground	Schematic Design	Fall 2018
10	Forest Park-Union Tpk./Metropolitan Ave.	Schematic Design	Fall 2018
11	Forest Park-Union Tpk./Myrtle Ave JRP Exit	Schematic Design	Fall 2018
12	Middle Village Playground	Schematic Design	Fall 2018
13	Real Good Park	Schematic Design	Fall 2018
14	Starr Playground	Schematic Design	Fall 2018
15	Betsy Head Park	Preliminary: Geotechnical Investigation	Fall 2018
16	Brevoort Playground	Preliminary: Geotechnical Investigation	Fall 2018
17	Corona Golf Playground	Preliminary: Geotechnical Investigation	Fall 2018
18	Howard Playground (Howard Houses)	Preliminary: Geotechnical Investigation	Fall 2018
19	Jackie Robinson Park	Preliminary: Geotechnical Investigation	Fall 2018
20	Maria Hernandez Park	Preliminary: Geotechnical Investigation	Fall 2018
21	Railroad Playground	Preliminary: Geotechnical Investigation	Fall 2018
22	South Pacific Playground	Preliminary: Geotechnical Investigation	Fall 2018
23	Van Dyke Playground (Van Dyke Houses)	Preliminary: Geotechnical Investigation	Fall 2018
24	Weeksville Playground	Preliminary: Geotechnical Investigation	Fall 2018
25	Hope Ballfield	Preliminary: Geotechnical Investigation	TBD
26	Admiral Farragut Playground	Potential	Fall 2019
27	Barretto Park	Potential	Fall 2019
28	Belmont Playground	Potential	Fall 2019
29	Ciccarone Park	Potential	Fall 2019
30	Fairmount Playground	Potential	Fall 2019
31	Givan Square/Camponaro Playground	Potential	Fall 2019
32	Gun Hill Playground	Potential	Fall 2019
33	Havemeyer Playground	Potential	Fall 2019
34	Matthews Muliner Playground	Potential	Fall 2019
35	Vidalia Park	Potential	Fall 2019
36	Bridge Park 3 - East and West	Potential	TBD
37	Bulova Park	Potential	TBD
38	Colgate Close Park	Potential	TBD
39	Crotona Parkway Malls @ E. 175th St.	Potential	TBD

40	Crowley Playground	Potential	TBD
41	Ennis Playground	Potential	TBD
42	Equity Park	Potential	TBD
43	Gorman Playground	Potential	TBD
44	Hart Playground	Potential	TBD
45	Hoffman Park	Potential	TBD
46	Kimlau Square (Chatham Sq.)	Potential	TBD
47	Linden/Park of the Americas	Potential	TBD
48	London Planetree Playground	Potential	TBD
49	Magenta Playground	Potential	TBD
50	Mazzei Playground	Potential	TBD
51	Parkside Playground	Potential	TBD
52	St. Andrew's Playground	Potential	TBD
53	Van Nest Park	Potential	TBD
54	Whalen Grove Triangle	Potential	TBD
55	Zimmerman Playground	Potential	TBD
Jointly Operated Playgrounds (DOE/DPR)			
56	Annadale Playground. / P.S. 175 Q	Schematic Design	Fall 2018
57	Boerum Park / Cobble Hill School	Schematic Design	Fall 2018
58	Horace Harding Playground / P.S. 206 Q	Schematic Design	Fall 2018
59	I.S. 119 Glendale / Pinocchio Playground	Schematic Design	Fall 2018
60	Park Slope Playground / P.S. 282 K	Schematic Design	Fall 2018
61	Pinocchio Playground / I.S. 119 Q	Schematic Design	Fall 2018
62	Rosemary's Playground	Schematic Design	Fall 2018
63	Rosemary's Playground	Schematic Design	Fall 2018
64	Russell Sage Playground / J.H.S. 190 Q	Schematic Design	Fall 2018
65	The Painter's Playground / P.S. 174 Q	Schematic Design	Fall 2018
66	Carver Playground / P.S. 40	Preliminary: Geotechnical Investigation	Fall 2018
67	Dr. Green Playground / P.S. 284 K	Preliminary: Geotechnical Investigation	Fall 2018
68	El Shabazz Playground / P.S. 262 K	Preliminary: Geotechnical Investigation	Fall 2018
69	Eleanor Roosevelt Playground / P.S. 81	Preliminary: Geotechnical Investigation	Fall 2018
70	Evergreen Playground / P.S. 45 K	Preliminary: Geotechnical Investigation	Fall 2018
71	Osborn Playground / P.S. 140K / I.S. 275K	Preliminary: Geotechnical Investigation	Fall 2018
72	Tiger Playground / I.S. 296 Halsey Jr. High	Preliminary: Geotechnical Investigation	Fall 2018
73	Woods Playground /I.S. 335 Granville T. Woods	Preliminary: Geotechnical Investigation	Fall 2018
74	Chester Playground / P.S. 396/P.S. 327 K	Potential: Site Analysis	Fall 2019
75	Fermi Playground /I.S. 111/ 347 / 349 K	Potential: Site Analysis	Fall 2019
76	Evergreen Park	Potential: Site Analysis	Spring 2020
77	Harold Schneiderman Playground	Potential: Site Analysis	TBD
78	Poor Richard's Playground	Potential: Site Analysis	TBD
79	Bartlett Playground	Potential: Site Analysis	TBD
80	Classon Playground (P.S. 270)	Potential: Site Analysis	TBD
81	Oracle Playground (P.S. 46)	Potential: Site Analysis	TBD

82	P.S. 127Q / East Elmhurst Playground	Potential: Site Analysis	TBD
83	P.S. 148 Q / Playground Ninety (90)	Potential: Site Analysis	TBD
84	P.S./IS 35 K and Decatur Playground	Potential: Site Analysis	TBD
85	Rocket Park / J.H.S. 202 Robert H. Goddard	Potential: Site Analysis	TBD
86	Willoughby Playground (P.S. 23)	Potential: Site Analysis	TBD
87	Belmont Playground (P.S. 214)	Potential: Assigned	Fall 2019
88	Bruckner Playground /I.S. 101 X	Potential: Assigned	Fall 2019
89	Caserta Playground / P.S. 106 X	Potential: Assigned	Fall 2019
90	Castle Hill Playground/ I.S. 127 X	Potential: Assigned	Fall 2019
91	Rienzi Playground / P.S. 21 X	Potential: Assigned	Fall 2019
92	Wakefield Playground (P.S. 16)	Potential: Assigned	Fall 2019

EXHIBIT B – Public Property Retrofits (Continued)

	Site Name	Status	Actual/Projected Completion Date
Schools (DOE)			
1	P.S / M.S. 194 X	Constructed	October 2013
2	P.S. 321 K William Penn	Schematic Design	Fall 2017
3	P.S. 102 Q Bayview	Schematic Design	Spring 2018
4	P.S. 12 Q	Schematic Design	Spring 2018
5	P.S. 81 Q Jean Paul Richter	Schematic Design	Spring 2018
6	P.S. 9 K Teunis Bergen	Schematic Design	Spring 2018
7	P.S. 91 Q Richard Arkwright	Schematic Design	Spring 2018
8	P.S. 165 K	Preliminary: Geotechnical Investigation	Spring 2018
9	P.S. 178 Annex - Bed Stuy ECC	Preliminary: Geotechnical Investigation	Spring 2018
10	P.S. 178 K	Preliminary: Geotechnical Investigation	Spring 2018
11	P.S. 183 K	Preliminary: Geotechnical Investigation	Spring 2018
12	P.S. 233 K	Preliminary: Geotechnical Investigation	Spring 2018
13	P.S. 299 K	Preliminary: Geotechnical Investigation	Spring 2018
14	P.S. 309 K	Preliminary: Geotechnical Investigation	Spring 2018
15	P.S. 328 Phyllis Wheatley	Preliminary: Geotechnical Investigation	Spring 2018
16	P.S. 5 K	Preliminary: Geotechnical Investigation	Spring 2018
17	Thomas Jefferson H.S.	Preliminary: Geotechnical Investigation	Spring 2018
18	Grand Street H.S. Campus - K	Potential: Site Analysis	Spring 2019
19	I.S. 263 / 323 K Mott Hall Bridges	Potential: Site Analysis	Spring 2019
20	P.S. 145 K - Andrew Jackson	Potential: Site Analysis	Spring 2019
21	Evander Childs H.S. - X	Potential: Assigned	Spring 2019
22	P.S. 108 X	Potential: Assigned	Spring 2019
23	P.S. 12 X	Potential: Assigned	Spring 2019
24	P.S. 21 X	Potential: Assigned	Spring 2019
25	P.S. 76 X	Potential: Assigned	Spring 2019
26	P.S. 78 X	Potential: Assigned	Spring 2019
27	P.S. 97 X	Potential: Assigned	Spring 2019
Cultural Centers (DDC/DCLA)			
1	Flushing Town Hall	In Construction	Spring 2016

EXHIBIT B – Public Property Retrofits (Continued)

	Site Name	Status	Actual/Projected Completion Date
Housing Developments (NYCHA)			
1	Bronx River	Constructed	September 2011
2	Hope Gardens (Demonstration Project)	Constructed	September 2013
3	Seth Low (Demonstration Project)	Constructed	September 2013
4	Edenwald	In Construction	Fall 2018
5	Gowanus	60% Design	Fall 2018
6	Wyckoff	Schematic Design	Fall 2018
7	Hope Gardens	Preliminary: Geotechnical Investigation	Spring 2018
8	Bushwick II (Groups A-E)	Preliminary: Geotechnical Investigation	Spring 2018
9	Brevoort	Preliminary: Geotechnical Investigation	Spring 2018
10	Kingsborough	Preliminary: Geotechnical Investigation	Spring 2018
11	Roosevelt II	Preliminary: Geotechnical Investigation	Spring 2018
12	Saratoga Village	Preliminary: Geotechnical Investigation	Spring 2018
13	Brownsville	Potential: Site Analysis	Spring 2018
14	Carter G Woodson	Potential: Site Analysis	Spring 2018
15	Garvey	Potential: Site Analysis	Spring 2018
16	Glenmore Plaza	Potential: Site Analysis	Spring 2018
17	Howard	Potential: Site Analysis	Spring 2018
18	Seth Low	Potential: Site Analysis	Spring 2018
19	Tilden	Potential: Site Analysis	Spring 2018
20	Van Dike I	Potential: Site Analysis	Spring 2018
21	Van Dike II	Potential: Site Analysis	Spring 2018
22	Throggs Neck	Potential: Assigned	Spring 2019
23	Eastchester Gardens	Potential: Assigned	Spring 2019
24	Gun Hill	Potential: Assigned	Spring 2019
25	Glebe-Westchester	Potential: Assigned	Spring 2019

EXHIBIT C – Trust for Public Land – Green Infrastructure Schoolyards to Playgrounds

	School Name	Status	Actual/Projected Completion Date
Trust for Public Land / DOE Green Infrastructure Schoolyards			
1	JH.S. 218 K J.P. Sinnott	Constructed	September 2013
2	P.S. 261 K	Constructed	September 2013
3	P.S. 65 K Cesiah Toro Mullane	Constructed	September 2013
4	J.H.S. 157 Q Stephen A Halsey	Constructed	September 2014
5	J.H.S. 162 K The Willoughby	Constructed	September 2014
6	C.S. 300 X Twin Parks Campus	Constructed	September 2015
7	J.H.S. 185 Q Edward Bleeker	In Construction	Spring 2016
8	P.S. 15 M Roberto Clemente	In Construction	Spring 2016
9	P.S. 75 K Robert E. Peary	In Construction	Spring 2016
10	P.S. 154 M	Schematic Design	Spring 2017
11	P.S. 184 / P.S. 137 M	Schematic Design	Fall 2017
12	I.S. 581 K	Contract Plans (60%)	Fall 2017
13	I.S. 71 K	Contract Plans (60%)	Fall 2017
14	P.S. 120 Q	Contract Plans (60%)	Fall 2017
15	I.S. 189 Q / Flushing International H.S.	Preliminary: Geotechnical Investigation	Spring 2018
16	I.S. 250 Q R. F. Kennedy / Qns Sch. of Inquiry	Preliminary: Geotechnical Investigation	Spring 2018
17	I.S. 390 K / Kipp Academy	Preliminary: Geotechnical Investigation	Spring 2018
18	P.S. 295 K / I.S. 88 K	Preliminary: Geotechnical Investigation	Spring 2018
19	I.S. 126 Q	Potential: Site Analysis	TBD
20	I.S. 313 / 339 (OLD 147) X	Potential: Site Analysis	TBD
21	P.S. 123 K	Potential: Site Analysis	TBD
22	P.S. 123 M	Potential: Site Analysis	TBD
23	P.S. 17 K	Potential: Site Analysis	TBD
24	P.S. 19 M	Potential: Site Analysis	TBD
25	P.S. 2 Q	Potential: Site Analysis	TBD
26	P.S. 241 K	Potential: Site Analysis	TBD
27	P.S. 298 K	Potential: Site Analysis	TBD
28	P.S. 38 K	Potential: Site Analysis	TBD
29	P.S. 58 Q	Potential: Site Analysis	TBD
30	P.S. 6 M	Potential: Site Analysis	TBD

EXHIBIT D – Community Parks Initiative – Phase 1 and Phase 2

	City Parks Initiative Phase 1 Sites
Bronx	
1	Hunts Point Playground
2	Little Claremont Park
3	Longfellow Garden
4	Lyons Square Playground
5	Playground 52 LII
6	Ranaqua Park
7	Saw Mill Playground
8	Seabury Park
Brooklyn	
9	Jesse Owens Playground
10	Saratoga Ballfields
11	Stockton Playground
12	Ten Eyck Playground
13	Thomas Boyland Park
Manhattan	
14	Carmansville Playground
15	Henry M. Jackson Playground
16	James Weldon Johnson Playground
17	Martin Luther King Playground
18	Playground 103 CIII*
19	Sol Lain Playground
20	St. Nicholas Playground North
Queens	
21	Astoria Heights Playground
22	Bowne Playground
23	Grassmere Playground*
24	Van Alst Playground
Staten Island	
25	Arrochar Playground*
26	De Matti Playground
27	Grandview Playground
28	Levy Playground*
29	McDonald Playground*

**located outside of Combined Sewer Area*

	City Parks Initiative Phase 2 Sites
Bronx	
1	Bridge Playground
2	Cpl. Fischer Park
3	Daniel Boone Playground
4	Ogden Plimpton Playground
5	Playground One Thirty Four CXXXIV
6	Plimpton Playground
7	Prospect Playground
8	Walton Park
Brooklyn	
9	Lt. Joseph Petrosino Park
10	Epiphany Playground
11	Newport Playground
12	Lafayette Playground*
13	La Guardia Playground
14	Bergen Beach Playground*
15	Weeksville Playground
16	Ericsson Playground
Manhattan	
17	St Nicholas South
18	Joseph C. Sauer Park
19	Eugene McCabe
20	Abraham Lincoln Playground
21	Bill Bojangles Robinson Playground
22	Peter Minuit Playground
23	Bloomingdale Playground
24	Playground One
Queens	
25	Astoria Health Playground
26	Almeda Playground*
27	Playground Thirty Five XXXV
28	Bland Playground
Staten Island	
29	Stapleton Playground
30	Luis Lopez Playground
31	Mariner's Harbor Playground
32	Markham Playground

**located outside of Combined Sewer Area*

EXHIBIT E – Green Infrastructure Grant Program

	Grant Project Name	Borough	Status	Actual/Projected Completion Date
1	Brooklyn Navy Yard	Brooklyn	Constructed	April 2013
2	Lenox Hill Neighborhood House	Manhattan	Constructed	June 2013
3	Osborne Association	Bronx	Constructed	September 2013
4	Gil Hodges Community Garden	Brooklyn	Constructed	November 2013
5	Bishop Loughlin Senior High School	Brooklyn	Constructed	December 2013
6	Queens College	Queens	Constructed	December 2013
7	The New School University*	Manhattan	Constructed	April 2014
8	Banana Kelly Community Improvement Association*	Bronx	Constructed	July 2014
9	Albert Einstein College of Medicine*	Bronx	Constructed	November 2014
10	Ballet Tech Foundation*	Manhattan	Constructed	April 2015
11	Poppenhusen Institute	Queens	Constructed	May 2015
12	Fifth Avenue & 46th Street Association*	Manhattan	Constructed	May 2015
13	Local 1 Plumber's Union*	Queens	Constructed	June 2015
14	Forest House Affordable Housing	Bronx	Constructed	December 2015
15	Related Companies	Manhattan	Constructed	December 2015
16	The Church of St. Luke & St. Matthew*	Brooklyn	In Construction	Summer 2016
17	Montefiore Medical Center-Wakefield Campus	Bronx	In Design	Summer 2016
18	Phoenix Restoration Building	Brooklyn	Design Final	Summer 2016
19	South Bronx Economic Development Corp.-Jasmine Court*	Bronx	Design Final	Summer 2016
20	South Bronx Economic Development Corp.-Venture Center*	Bronx	Design Final	Summer 2016
21	Pratt Institute*	Brooklyn	In Construction	Summer 2016
22	Wildlife Conservation Society (Bronx Zoo)	Bronx	In Construction	Summer 2016
23	Bedford Stuyvesant Restoration	Brooklyn	In Design	Fall 2016
24	New York Botanic Garden	Bronx	In Design	Fall 2016
25	Gowanus Arts	Brooklyn	In Design	Fall 2016
26	Montefiore Medical Center-Moses Campus	Bronx	In Design	Fall 2016
27	Two Bridges Neighborhood Council	Manhattan	In Design	Winter 2016
28	New York University Langone Medical Center	Manhattan	In Design	Winter 2016
29	Paradise Garden	Bronx	In Design	Winter 2016
30	Salmar Building	Brooklyn	In Design	Winter 2016
31	Queens College Dining Hall	Queens	In Design	Spring 2017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