



# NYC GREEN INFRASTRUCTURE 2016 ANNUAL REPORT



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## **Introduction**

This 2016 Annual Report provides updates on the New York City Department of Environmental Protection's (DEP) Green Infrastructure Program (the "Program"). Officially launched in 2011 after years of foundational work, the Program is a multiagency partnership effort led by DEP. The Program goal is to reduce combined sewer overflows (CSO) into the waterways of New York City by managing stormwater from impervious surfaces using green infrastructure (GI) technologies.

The Program is progressing toward its 2030 CSO reduction goal by retrofitting the City's streets, sidewalks and other public property, and incentivizing retrofits on private property. The Program is also responsible for performing maintenance of constructed GI in the right-of-way (ROW), conducting research and development, engaging elected officials and civic stakeholders, tracking all green infrastructure projects, and GI mapping and data management efforts.

To date, the Program has prioritized implementation in combined sewer tributary areas based on CSO volume, frequency of overflow, and consideration of anticipated benefits of projects constructed through DEP's Waterbody/Watershed Facility Plans or other planning efforts. DEP also notes outfalls in close proximity to existing and planned public access locations.

Over the last five years, DEP has successfully installed thousands of ROW rain gardens and other green infrastructure practices in Priority CSO Tributary Areas under so-called Area-wide GI contracts. Thousands more GI practices are in planning, design, and construction phases. To identify future opportunities, DEP will gradually shift the focus of the Program from primarily ROW to public on-site and private green infrastructure implementation through strategic planning, growing our interagency partnerships, and developing innovative incentive programs. DEP has committed to staff increases described in the Organizational Capacity section in addition to increasing consultant and professional services to support a focused effort to bring these initiatives to scale.

In 2016, the Program advanced all programmatic areas of citywide implementation. Most notably:

- Continued to advance nearly 200 public property retrofits with city agency partners
- Initiated new Area-wide ROW GI contracts in the Bronx, Brooklyn and Queens
- Initiated a strategic planning effort to evaluate green infrastructure opportunities at the watershed scale, including both combined and separate sewer areas
- Submitted the following two reports to the New York State Department of Environmental Conservation (DEC):
  - The Contingency Plan submitted on June 27, 2016, outlined the Program plan for reaching the 1.5% implementation milestone. The Contingency Plan showed the planned projects that will reach the remaining impervious acres needed by 2020.
  - The Performance Metrics Report submitted on June 30, 2016 describes CSO reductions based on the 1.5% green infrastructure implementation rate and a modeled CSO volume reduction based on the 10% implementation rate. The report also included an equivalency rate based on the 1.5% implementation rate that reflects the initial phase of the Program, which relied primarily on retention-based ROW green infrastructure.



This 2016 Annual Report provides updates on all Program activities, as well as on the impervious acres managed through 2016, estimated impervious acres projected to be managed through 2017, and Program funding. Previous Annual Reports and the Green Infrastructure Plan can be found on DEP's website [here](#).



*Students, faculty, and staff gather for a DOE/TPL Green Infrastructure Playground opening*

## **Building Organizational Capacity**

### **Staffing**

#### **Program Staff and Partner Agency Support**

In 2016, the DEP Office of Green Infrastructure was reorganized and the staff was distributed between the Bureau of Environmental Planning and Analysis (BEPA) and the Bureau of Engineering Design and Construction (BEDC). This reorganization allows the growing responsibility areas of the program to be more efficiently carried out by staff experienced in those areas, particularly leveraging existing design and construction expertise within BEDC.

Under this new organization, BEDC staff will continue to advance ROW implementation through design, project management, and construction oversight. BEPA staff will continue to sustain agency partnerships, facilitate all planning efforts, provide program and budget oversight, and manage implementation of public property retrofit and private property incentive programs.

In 2016, new staff was hired to support the expanding design and construction work, to provide additional support for construction oversight and inspection, and to assist in asset mapping and tracking. DEP also continues to fund full-time staff at our partnering agencies, the New York City Department of Transportation (DOT) and the New York City Department of Parks and Recreation (DPR) who provide design review for primarily the ROW projects. The total count of Program staff positions across the three City agencies is now 55.

Additionally, DEP could not have advanced the Program as quickly as it has without the organizational capacity of our agency partners including the New York City Economic Development Corporation (EDC) and the New York City Department of Design and Construction (DDC) who manage many ROW design and construction contracts. EDC also manages a large portfolio of design and construction for many of the current public property retrofit projects and assists DEP in the interagency coordination with the New York City Housing Authority (NYCHA), the New York City Department of Education (DOE), and DPR. These partnerships are critical to the ongoing success of the Program.

**Table 1: DEP and Partner Agency Green Infrastructure Program Staffing by Year**

Green Infrastructure Program	Total Headcount per Calendar Year		
	2014	2015	2016
DEP (BEPA, BEDC)	21	25	49
DPR	3	5	5
DOT	1	1	3
<b>TOTAL</b>	<b>25</b>	<b>31</b>	<b>55</b>

**2017 ACTION ITEM:** DEP will continue to add new staff to expand the public property retrofit and private property incentive programs as well as for *NYC GreenHUB*, mapping, and data management team.

Additionally, DEP will fund new staff at DPR and DOE to support those agencies to review and facilitate the growth in projects on their properties, respectively.

### ROW Green Infrastructure Maintenance

During 2016, DEP's Bureau of Water and Sewer Operations (BWSO) continued to provide maintenance for completed ROW Green Infrastructure practices in Brooklyn, Queens and the Bronx. BWSO Green Infrastructure Maintenance staff also provided supplemental maintenance to ROW GI practices that were still under the contract guarantee period.

**Table 2: DEP ROW Green Infrastructure Maintenance Staffing by Year**

Green Infrastructure Maintenance	Total Headcount per Calendar Year		
	2014	2015	2016
DEP (BWSO)	15	23	25

*Note: Total Headcount includes both full-time and part-time, seasonal titles.*

The maintenance of green infrastructure practices within publicly owned property such as DOE's schoolyards is typically carried out by the owner agency. DEP has agreed to maintain the green infrastructure retrofits located on NYCHA property and has provided maintenance for those constructed projects throughout 2016.

**2017 ACTION ITEMS:** BWSO Green Infrastructure Maintenance will hire 40 more staff in 2017 to provide maintenance for newly constructed ROW GI practices. BWSO will establish an additional maintenance facility in the Bronx to eliminate excess travel time and to improve the overall efficiency of the Bronx GI maintenance crew. In addition, BWSO has completed a facility plan for its central maintenance facility located in Greenpoint, Brooklyn. BWSO will also begin providing supplemental maintenance for those assets still under contractor guarantee, where necessary. DEP will continue to provide maintenance for NYCHA projects throughout the useful life of the assets.

## Capital Funding

Capital funding covers costs such as site selection, design, construction, and construction management for green infrastructure projects. As of March 2017, the Program had encumbered over \$410 million with another \$1 billion budgeted over the next 10 years. This capital funding will support green infrastructure contracts undertaken by DEP and agency partners, including the Area-wide contracts, retrofit projects with other City agencies, Trust for Public Land partnership projects, and the Grant Program.

Encumbered capital funding are funds that are registered into capitally funded contracts such as professional services and construction contracts. These funds are committed to those projects (or contracts) and are spent down over the course of the contract term. The Capital Budget is a budgeting document that outlines the Program's projected capital commitments over a period of time, i.e. a four-year plan or a 10-year plan.

**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	\$114,976,316
FY17 <sup>1</sup>	\$60,520,206
<b>TOTAL</b>	<b>\$410,691,296</b>

Fiscal Year	Approved FY 2018 Preliminary Capital Improvement Program
FY17 <sup>2</sup>	\$98,225,986
FY18 - FY27	\$923,271,000
<b>TOTAL</b>	<b>\$1,021,496,986</b>
<b>PROGRAM GRAND TOTAL <sup>3</sup></b>	<b>\$1,432,188,282</b>

<sup>1</sup>FY17 Encumbered to date

<sup>2</sup>FY17 Remaining

<sup>3</sup>Estimated total is based on the total encumbered and the Approved FY18 Preliminary 10-Year Plan

## Expense Funding

The Program's expenditures and expense budget through FY19 is \$39.6 million which covers operational costs, such as maintenance of green infrastructure, office and field staff, materials, equipment, and other non-capitally eligible programmatic needs such as research and development. The expenditures below represent spent funding and the Expense Budget represents the projected commitments for expense funding through fiscal year 2019.

**Table 6: Expense Funding Expended and Budgeted**

Fiscal Year	Expenditures (Actual Expended)
FY12	\$615,295
FY13	\$3,269,689
FY14	\$3,892,778
FY15	\$4,151,148
FY16	\$5,669,654
<b>TOTAL</b>	<b>\$17,598,564</b>

Fiscal Year	Expense Budget
FY17 - Current	\$10,829,188
FY18	\$12,897,281
FY19	\$15,932,272
<b>TOTAL</b>	<b>\$39,658,741</b>



## Project Tracking and Data Management

In 2016, DEP continued the development of *NYC GreenHUB*, a web-based application with data management capabilities that provides project tracking for the thousands of green infrastructure practices citywide throughout their life cycle.<sup>[1]</sup> DEP has been developing, testing, and moving to beta functionality for *NYC GreenHUB* production and expects that the full system will be complete in the spring of 2017. Once complete, the system will be used by DEP staff, DEP design consultants, and other partnering agencies as a centralized hub for all green infrastructure data.

**2017 ACTION ITEM:** In early 2017, DEP will launch *NYC GreenHUB*.

## Communication Strategies and Educational Activities

In coordination with the DEP Bureau of Public Affairs and Communications (BPAC), Program staff take all opportunities to educate and engage the public on aspects of the Program. DEP continues engagement with residents and neighborhoods timed with the widespread GI construction activity in those areas. The [brochure](#) and [door hanger](#) typically distributed during design and construction for Area-wide GI contracts contain DEP's green infrastructure "hotline" phone number (718-595-6500) and an outreach email address ([gioutreach@dep.nyc.gov](mailto:gioutreach@dep.nyc.gov)) monitored regularly by a communications staff person.

DEP also continues to meet regularly with and provide resources to local elected officials, community boards, environmental organizations, and civic groups on many topics. A list of DEP-led meetings and presentations related to the Program and held in 2016 is attached as Exhibit A.

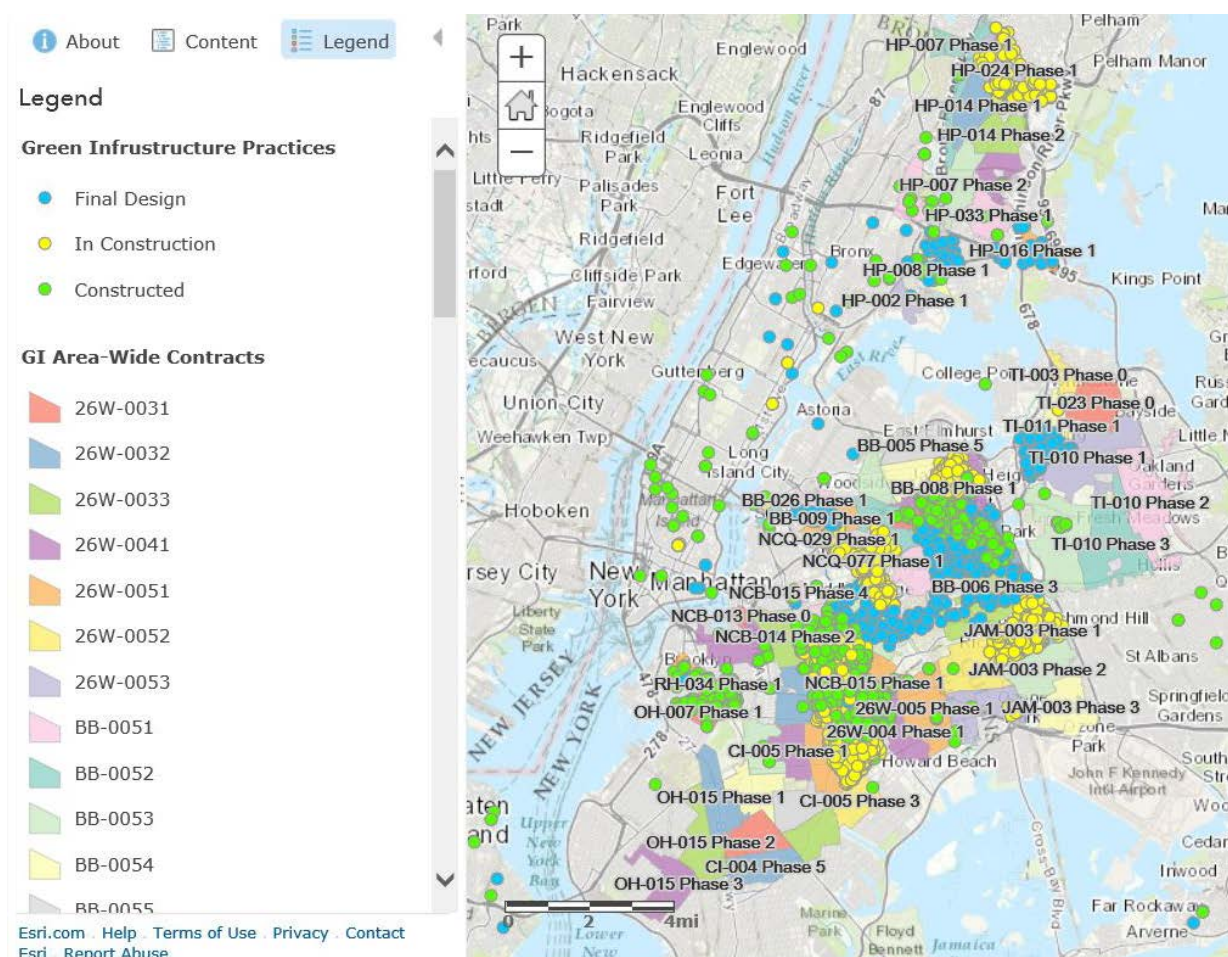
To further public awareness of ROW rain gardens, DEP developed an identification decal that could be affixed to rain garden tree guards. In 2016, the Public Design Commission approved the ROW rain garden decal. Initial durability field-tests in advance of citywide installation yielded moderate results.

In 2016, DEP released a publicly accessible, interactive web-map showing all green infrastructure practices at advanced design, in construction, or constructed statuses. The map can be found on the DEP website [here](#) and is updated automatically on a monthly basis. A screenshot of the online map, below, shows the areas of implementation as of early 2017.

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<sup>[1]</sup> 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 fields with infiltration capability, rainwater harvesting, and green roofs.

**Figure 1: Program Map indicating Green Infrastructure Practice Locations and Contract Areas**



**2017 ACTION ITEM:** In 2017, ROW rain garden decal will be more widely installed. Alternative green infrastructure identification markers and educational signage will be developed. In response to public interest and to explain the new designs of green infrastructure practices, new print materials will be developed and distributed during design, construction, and maintenance of Area-wide GI contracts to provide residents detail about each stage of implementation.

## Regulatory and Rulemaking Activities

Previous Annual Reports, which can be found on DEP's website [here](#), describe the Green Roof Tax Abatement, the Parking Lot Stormwater Charge Pilot Program, and other previous rulemaking activities

In 2016, DEP drafted a rule change clarifying DEP's authority to disperse grants to private property owners.

### 2017 ACTION ITEMS:

In early 2017, DEP will promulgate the proposed grant rule. DEP will continue in-depth analysis on how to incentivize green infrastructure for private property owners in a variety of program administration scenarios.

## **Citywide Implementation**

### **Right-of-way Green Infrastructure**

In 2016, three new large Area-wide GI contracts began within the Flushing Bay, Bronx River, and Jamaica Bay CSO Tributary Areas. Ongoing Area-wide GI contracts in 2016 completed construction or were under construction in Brooklyn, Queens, and the Bronx. Figure 2 (next page) shows the extent and status of Area-wide GI contracts.

Detailed descriptions of the Area-wide implementation strategy and the design and construction processes are described in previous Annual Reports. Photos of ROW GI construction can be found on DEP's website [here](#).

**2017 ACTION ITEM:** Construction is expected to begin in areas of the Bronx River, Flushing Bay, Jamaica Bay, and Newtown Creek watersheds.

### **Standard Designs**

DEP finalized designs for ROW Greenstrips and ROW Infiltration Basin and design guidelines for ROW Stormwater Greenstreets and On-site Practices in 2016. The latest standard design drawings are available on DEP's website [here](#).

**2017 ACTION ITEM:** In response to public interest, DEP engineers will develop alternatives to standard rain garden designs that match existing ROW surface conditions within the utility strip zone (eg. turf grass or concrete) while continuing to provide stormwater infiltration.



*A stormwater greenstreet in the rain*







## Public Property Retrofits

In 2016, DEP and its city agency partners continued green infrastructure project design development on almost 200 publicly owned properties. The Departments of Parks and Recreation, Education, Design and Construction, as well as the NYC School Construction Authority and the NYC Housing Authority have been and will continue to play a critical role in the implementation of green infrastructure on public property. DEP acknowledges these agencies for sharing its mission and for their willingness to take on more work by facilitating the design and construction of public property retrofits. In the next several years, the agency partnership projects will deliver real improvements to New York City's schools, parks, and housing, as well as improve water quality in the City. Photos of constructed projects can be seen [here](#). See the Exhibits B-G of this Annual Report for a list of these sites and their statuses.

### NYC Department of Parks and Recreation (DPR)

In 2016, DEP and DPR continued to investigate and design green infrastructure retrofits on more than 90 park sites. DEP works with the DPR Capital Unit and the DPR Green Infrastructure/Forestry Unit to identify, design, and implement these projects, some of which are incorporated into ongoing capital projects.

In addition to the above, DEP has committed \$50 million towards green infrastructure construction as part of DPR's [Community Parks Initiative](#) (CPI). DEP-funded green infrastructure is included in 28 parks in CPI Phase 1 and six parks in CPI Phase 2. In 2016, DPR announced a third phase of 12 CPI projects that are under investigation for green infrastructure. In 2017, DPR expects to complete construction on 22 sites and will begin construction at six other sites in CPI Phase 1.

### NYC Department of Education (DOE)

In 2016, DEP and DOE continued to investigate and design green infrastructure retrofits on more than 45 sites. In 2017, DOE will initiate a construction contract to facilitate the construction of approximately 24 school projects to begin in early 2018.

### NYC Department of Education with the Trust for Public Land (TPL) – Green Infrastructure Playgrounds

In 2016, the TPL, DOE, DEP initiated design of eight new sites, continued design of five sites, and completed construction of three sites. Nine playgrounds have been completed to date. See the link [here](#) for before and after photos of completed projects and visit TPL's NYC Playgrounds program website [here](#) for more information. In 2017, DEP, DOE, SCA, and TPL will renew their inter-agency MOU and continue to move projects through design and construction.

### NYC Housing Authority (NYCHA)

In early 2016, DEP and NYCHA finalized a revised agreement that will facilitate their partnership and several more public property retrofit projects. Throughout the year, DEP continued construction of on-site green infrastructure retrofits at the Edenwald Houses in the Bronx. DEP and NYCHA completed the design for green infrastructure at Gowanus Houses in Brooklyn, which NYCHA will build and integrate with Hurricane Sandy recovery work. DEP and NYCHA expects to:

- Begin construction at Gowanus Houses in summer 2017
- Complete construction at Edenwald Houses in fall 2017

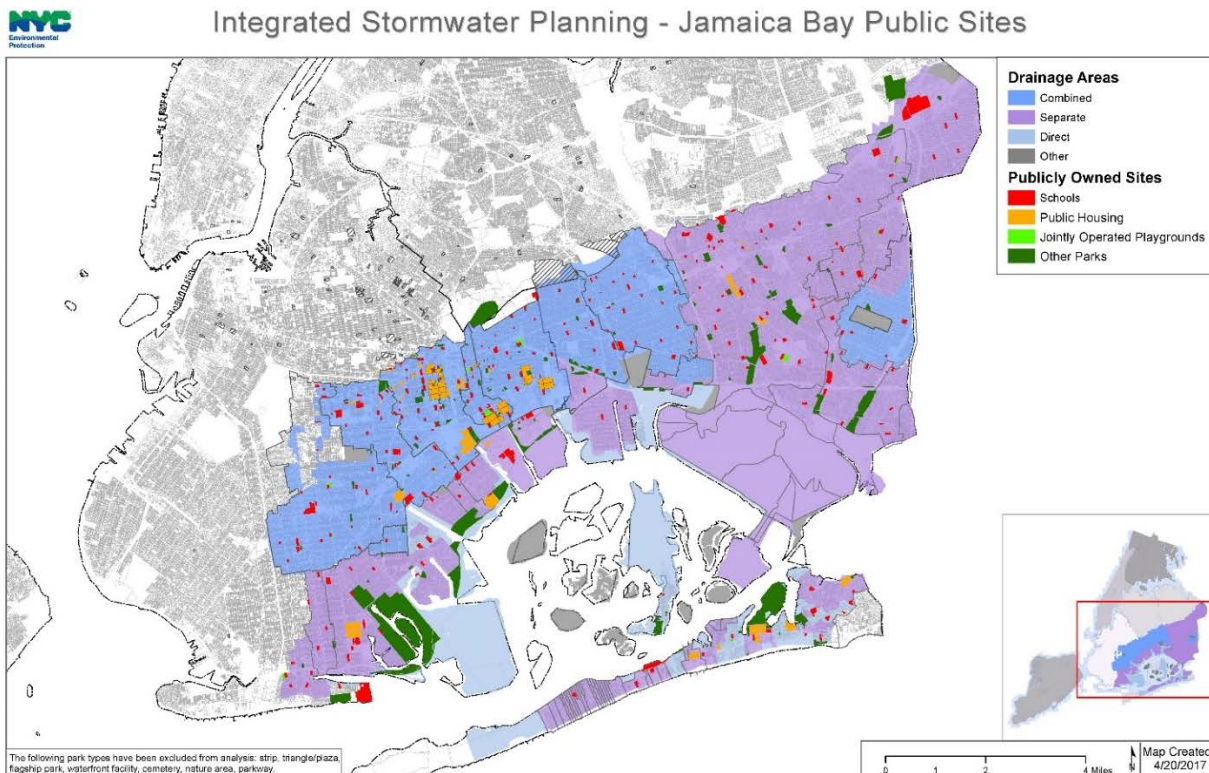
## NYC Department of Design and Construction (DDC) – Public Buildings Unit

DEP and DDC's Public Buildings unit evaluated nine projects for green infrastructure opportunities and initiated green infrastructure design on three projects. In 2017, DEP and DDC will continue analysis of one site, continue green infrastructure design on two public building projects, and will begin construction of another project. DEP and DDC are also working toward systematically adding green infrastructure to ongoing capital projects and providing dedicated resources for design GI on a strategic list of city-owned properties.

## Integrated Watershed Planning

As mentioned in the Introduction, DEP launched in 2016 and will advance in 2017 a new integrated watershed planning effort. DEP has begun to identify publicly owned sites with potential for GI retrofits in Priority CSO Tributary Areas and associated separately sewered areas. Through analysis of impervious area cover, discussions with partner agencies and site visits, and modeling to estimate volume reductions, DEP will initiate designs at strategically located, large impervious public properties over the next five years. This comprehensive review and allocation of design resources for on-site public property retrofits will expand the Program beyond the right-of-way to increase potential water quality improvements and co-benefits for New Yorkers. In addition to this strategic approach, DEP and partner agencies will continue to assess owner agency initiated capital projects for green infrastructure opportunities (i.e. opportunistic approach). Figure 3, below, is an example of the maps to be produced through the integrated watershed planning effort showing the various sewer system types and potential public property retrofit sites in the Jamaica Bay watershed.

**Figure 3: Example Draft Integrated Watershed Planning Map - Jamaica Bay**



## Green Infrastructure Incentives for Private Property Owners

### 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 \$15 million to 34 private property owners to build green infrastructure projects. In 2016, two projects started construction and four others were completed. Photos of planned and constructed grant projects are located [here](#). See Exhibit H of this Annual Report for a list of these sites and their statuses.

#### **2017 ACTION ITEM:**

DEP expects as many as 15 grant projects to be constructed in 2017. 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. The 2017 grant workshop schedule, past workshop presentations, and contact information for pre-submission meetings are on DEP's website [here](#).

### Expanded Private Incentive Program Planning

**Background:** DEP is looking to scale up cost-effective green infrastructure on private property. Using lessons learned over the course of the Green Infrastructure Grant Program's existence, best practices from other cities, outreach with stakeholders and industry experts, and spatial and engineering analyses to estimate the private stormwater market in NYC, DEP is creating new incentives aimed at achieving this goal.

#### *NRDC Collaboration*

In 2016, DEP launched a collaboration with the Natural Resources Defense Council (NRDC) to seek new ways in which DEP can facilitate the expansion of green infrastructure to even more private properties. One 2016 accomplishment of the collaboration was a Request for Information (RFI) released in September titled "*Management of a Green Infrastructure Private Property Incentive Program*." The RFI invited respondents to identify program management approaches for a new incentive program with the goal of implementing cost-effective green infrastructure on private property in NYC.

DEP received 14 responses to the RFI. The responses represented the interests or perspectives of almost 100 organizations. Of the 14 lead respondents, six are categorized as stakeholders, which include community organizations, advocacy groups, and members of the local green infrastructure design/construction community, five are categorized as engineering firms, two are categorized as program management firms, and one is categorized as a financier. The majority of the respondents currently work or operate in New York City. Recommendations varied widely due to the range of interests and experience in design, construction, advocacy, community development, and finance from the respondents. However, some highlights are summarized below.

- Project aggregation is essential to reduce transaction costs and speed up implementation schedules;
- Leveraging private capital is difficult without regulatory or policy changes to NYC's stormwater programs, but opportunities to identify bridge financing exist and are important for success;
- Community organizations can provide a number of roles in a private property incentive program;
- Targeted outreach strategies for different groups – designers, installers, property owners, etc., are critical;
- Upfront incentive rates in market-friendly units allow for more certainty and easier decision-making for property owners;

- Ease of use elements, such as standardized designs, market-friendly contracts/applications, technical guidance, etc., will increase participation;
- Program management structures may need to be adjusted based on lot size and property type targeted and green infrastructure practices implemented;

### *Pocantico Convening*

In November, DEP co-hosted a convening of green infrastructure stakeholders with NRDC and New York University (NYU)-Stern Center for Sustainable Business. The roughly 40 attendees met to develop a common understanding of opportunities and challenges associated with implementing green infrastructure on private property, identify necessary partnerships and roles of various public and private sector participants in new incentive programs and discuss roles for stakeholders. The two-day convening culminated with breakout sessions where groups were tasked with discussing two important questions:

- What are the success factors for a private green infrastructure program and how can they be measured?
- How can DEP garner widespread uptick in a new program?

The results of this exercise made it clear that it is difficult to meet all the various expectations for success while also scaling the program. DEP committed to continue outreach efforts to help prioritize goals and objectives from stakeholders.

### *Opportunities and Constraints*

The efforts identified above have brought to light a number of opportunities and constraints to developing and implementing expanded green infrastructure private incentives.

#### Opportunities:

- Various existing organizations and networks can be tapped for this effort
- New incentives can lead to capacity building opportunities for organizations looking to enter into or expand their efforts already in the green infrastructure industry

#### Constraints

- Site-level constraints create unknowns
- Estimating participation levels in a voluntary incentive program is difficult

### New Private Incentives Framework

As a result of the expanded private incentive program planning and outreach conducted during 2016, DEP has identified two parallel tracks for expanding green infrastructure private incentives. Possible implementation scenarios are identified below, subject to all applicable laws and procurement rules.

**Community-level incentive program:** This program will target smaller, more community-level projects. DEP is exploring different implementation scenarios including engagement of community organizations for green infrastructure implementation. The primary goals of this program are twofold. One, DEP sees value in utilizing existing relationships between community organizations and private property owners in organizations' coverage area. These relationships and the type of service that community organizations may be able to provide property owners are integral to implementing green infrastructure on smaller lots where opportunities may be limited and property owner engagement is higher. Two, this program would



give DEP the ability to work with organizations interested in expanding into or growing within the green infrastructure industry. By having a significant role in the program, i.e., by being the implementers of the green infrastructure projects, the community organizations can evaluate which roles they are able to perform and for which roles they need to enlist partners.

**GI retrofit incentive program:** This program will employ a more targeted approach in order to bring in larger sites such as multi-family residential, commercial and industrial properties at lower costs. One possible implementation scenario is having the program managed by a third-party organization with significant program management experience and the ability to structure the delivery of the green infrastructure asset in a manner that is highly replicable and cost-effective. The primary goals of this program are to scale-up quickly and manage costs by reevaluating implementation efforts. Community organizations are expected to have a role in this program as well.

While these two tracks are being designed with different sites and implementation partners in mind, they share many of the same goals, including:

- Co-benefits
- Community-based organization participation
- Cost savings through aggregation
- Scalability

**Private Stormwater Market Analysis:** Through its Research & Development Program, DEP also begun a task to estimate the market potential of green infrastructure on private property. Through this analysis, the team is developing conceptual designs and cost estimates for different green infrastructure types on a representative sample of properties in NYC. The team will then develop a regression equation using variables such as parcel characteristics, locational characteristics, and site constraints to predict green infrastructure retrofit costs on similar properties citywide. This analysis will help DEP evaluate the supply of private property retrofits at different incentive levels.

## **2017 ACTION ITEMS:**

DEP will convene workshops for organizations interested in participating in the community-level incentive program to present DEP's framework and solicit feedback from potential participants. Once a final framework is developed, DEP will announce the community-based program details. DEP will also develop a solicitation for the GI retrofit incentive program based on final approval from the City's legal and procurement offices. DEP also will complete the *Private Stormwater Market Analysis* and feed those results into the new incentive programs.

## 2012 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.<sup>1</sup> Since the rule took effect in 2012, approximately 837 sites have been affected. In 2016, 333 sites draining an area of 362.6 acres were affected by the Rule. Tables 4 and 5 present the breakdown of stormwater management types employed by applicants affected by the rule in 2016. 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.

In Table 5, the Total Planned and Total Constructed totals are independent from one another. Certified HCPs and SCPs are valid for two years. Therefore, the planned connections may not have been constructed in the same year. In addition, sites may have proposed more than one structure type. Constructed connections are those where DEP has permitted and inspected the installation of the certified sewer connection, and whatever structure was required pursuant to the approved SCP/HCP.

**2017 ACTION ITEM:** DEP is working internally to require all pertinent information on the site-connection proposals to allow DEP to credit the projects toward the Program.

**Tables 4 and 5: Stormwater Rule Summary**

Table 4 - Certified SCPs/HCPs Affected by Stormwater Rule by Borough, 2016	
Borough	# of HCPs/SCPs
Manhattan	93
Bronx	66
Brooklyn	117
Queens	53
Staten Island	4
<b>Total</b>	<b>333</b>
Contributing Drainage Area (acres)	362.6

Table 5 - SCP/HCP Sewer Connections Planned and Constructed by Structure Type						
Structure Type*	Connections Planned			Connections Constructed**		
	Primary Structure	Other Structures	Total Planned	Primary Structure	Other Structures	Total Constructed
Bioswale	1	0	1	0	0	0
Blue Roof	99	41	140	37	12	49
Green Roof	0	1	1	0	0	0
Drywell	3	15	18	2	5	7
Perforated Pipe	3	0	3	0	0	0
Tank	179	11	190	69	5	74
Storm Chamber	0	0	0	0	0	0
<b>Total</b>	<b>285</b>	<b>68</b>	<b>353</b>	<b>108</b>	<b>22</b>	<b>130</b>

\*Sites may have proposed more than one structure type

\*\*Constructed connections are those where DEP has permitted and inspected the installation of the certified sewer connection, and whatever structure was required pursuant to the approved SCP/HCP is assumed to have been installed/constructed

## Green Infrastructure Program Status

Table 3 below provides an update on the impervious acres managed through 2016 and projected acres to be managed in 2017. The 2016 acres managed represent all projects with final designs, those in construction, and those that are already constructed. The procurement timeline from final design to construction can be up to 12 months or longer and construction duration status includes the two-year guarantee period. Some Area-wide GI contracts that were at final design are still in procurement for contractors.

Reporting construction progress on an annual basis requires a review of all Program contracts. Progress will differ year by year as projects advance to the next phase, begin under new contracts or are completed. 2014 and 2015 produced high numbers of projects and acres managed based on how construction contracts rolled out and projects were completed. Projected 2017 projects and acres managed are lower based on current construction timelines.

While GI contracts are underway in limited areas of the East River/Open Waters watershed, DEP has prioritized the majority of its resources for green infrastructure in Priority CSO Areas tributary to waterbodies that do not meet existing water quality standards. By implementing the Program in this manner, DEP hopes to achieve CSO reductions and water quality benefits from the projects.

In June 2016, DEP submitted a contingency plan outlining the projects and schedule for achieving the remaining acres needed for the 1.5% initial application rate. The projects included in the plan are ROW area-wide projects that were underway when the plan was submitted and will begin construction within the next two years.

Looking ahead, DEP anticipates that the on-site public property retrofit program and new private property incentive programs will increasingly supplement the Area-wide GI program in meeting acres of impervious area and volumes of stormwater managed. Forthcoming annual reports will reflect that progress.

As discussed in the Adaptive Management section below, DEP continues to expand its toolbox 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. 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.

**Table 3: Built and Planned Green Infrastructure**

Waterbodies	Total Impervious Acres within Combined Sewer System (ac)	10% of Impervious Acres (ac)	1.5% of Impervious Acres (ac)	2010-2015		2016		Total 2010-2016			2017	
				Built		Built / In Construction <sup>1</sup>		Number of Assets	Total Impervious Acres (ac)	Total Percent of Impervious Acres Managed	Projected Construction <sup>2</sup>	
				Number of Assets	Impervious Acres (ac)	Number of Assets	Impervious Acres (ac)				Number of assets	Impervious Acres (ac)
Alley Creek	1,490	149	22	0	0	0	0	0	0	0.0%	0	0
Bronx River*	2,331	233	35	51	12	51	14	102	26	1.1%	0	0
Coney Island Creek	694	69	10	0	0	0	0	0	0	0.0%	0	0
Flushing Bay*	4,049	405	61	202	22	797	91	999	113	2.8%	4	0
Flushing Creek*	5,923	592	89	13	2	75	9	88	11	0.2%	101	10
Gowanus Canal*	1,387	139	21	35	4	88	8	123	13	0.9%	11	1
Hutchinson River*	1,128	113	17	22	1	186	25	208	27	2.4%	0	0
Jamaica Bay & CSO Tributaries*	7,891	789	118	794	85	329	34	1,123	119	1.5%	0	0
Newtown Creek*	4,524	452	68	273	22	918	79	1,191	101	2.2%	305	24
Paerdegat Basin	4,725	473	71	4	0	0	0	4	0	0.0%	0	0
Westchester Creek*	3,480	348	52	3	0	0	0	3	0	0.0%	0	0
<b>Total<sup>3</sup> Waterbodies</b>	<b>37,622</b>	<b>3,762</b>	<b>564</b>	<b>1,397</b>	<b>149</b>	<b>2,444</b>	<b>259</b>	<b>3,841</b>	<b>409</b>	<b>1.1%</b>	<b>421</b>	<b>36</b>
East River & Open Waters (ER/OW)	41,127	4,113	617	75	29	33	19	108	48	0.1%	6	6
<b>Total<sup>3</sup> Citywide<sup>4</sup></b>	<b>78,749</b>	<b>7,875</b>	<b>1,181</b>	<b>1,472</b>	<b>179</b>	<b>2,477</b>	<b>278</b>	<b>3,949</b>	<b>457</b>	<b>0.6%</b>	<b>427</b>	<b>42</b>

\* Priority CSO Tributary Areas

<sup>1</sup> Assets constructed or in construction in 2016, including sites in registered contracts having a Notice to Proceed

<sup>2</sup> Project sites projected to be constructed or in construction by 2017

<sup>3</sup>Sum may not add up to total due to rounding

<sup>4</sup>Total Waterbodies plus ER/OW



## **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 initial monitoring results of the R&D Program are finalized, DEP will include them and any implications for the Program in future Annual Reports.

## **Program Implementation Challenges and Lessons Learned**

The challenges DEP faces in siting green infrastructure dictates the application rates in any given CSO tributary area. Siting criteria applied consistently to all areas yield 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 earlier Annual Reports but remains very relevant to the Program. DEP continues to develop solutions to common siting obstacles.

### In the Right-of-Way:

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 ROW GI locations to DOB so that GI 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, the time and effort to evaluate each property and determine whether the project can move ahead is considerable. 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 public property retrofit cannot proceed due to extensive disrepair of a site or buildings that requires matching funds that are not available.



*Staff and consultants inspecting a newly planted rain garden*

## Green Infrastructure Research and Development Program

In 2015, DEP launched a \$10 million, five-year comprehensive R&D Program to support the GI Program by collecting crucial performance and co-benefit data through an extensive long-term monitoring effort. The R&D Program builds upon previous green infrastructure performance monitoring and data collection activities by DEP, as well as by other industry professionals and academics. Work done under the R&D Program will support the 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 Long Term Control Plans (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.

### Performance Metrics Report

The R&D Program also supported the development of the Green Infrastructure CSO Performance Metrics report, released in June 2016. The report is available on DEP's website [here](#). The report included in-depth analysis of existing monitoring data, represented all built and planned projects, and established a green infrastructure modeling methodology that reflects DEP's green infrastructure typical project types and implementation strategy.

More specifically, the report describes CSO reductions based on the 1.5% GI implementation rate and a modeled CSO volume reduction based on the 10% implementation rate. The 1.5% equivalency rate incorporates data on the existing and planned GI implemented through the Program to date, which has focused primarily on retention based ROW rain gardens using site-specific information to model individual, distributed assets. By contrast, the 10% equivalency rate incorporates a lumped approach to estimate future projects where GI asset specifics such as location, technology type and design details are not yet determined. Finally, for the 1.5% GI implementation rate, DEP has included two equivalency rates that are defined as: a) "Stormwater capture to CSO reduction ratio" and b) "Million Gallons (MG) of CSO eliminated on an annual basis per acre (Ac) of impervious area managed by GI."

### Green Infrastructure Monitoring

For the monitoring and data collection of green infrastructure performance, a substantial part of the R&D program, DEP completed the Green Infrastructure Monitoring Strategy and Protocols report in June 2016. The Protocols report summarizes a wide range of research topics that will be investigated through numerous experiments for multiple types of green infrastructure practices being implemented under varying environmental conditions. Each experiment was developed by assessing the wide range of DEP's research targets through three lenses:

- 1) typologies: on which type of GI practice (e.g. rain garden, permeable pavement) should the target be assessed;
- 2) parameters: what are the relevant characteristics of the GI practices that should be varied systematically in the monitoring effort; and

### 3) performance metrics: what will be quantified

The experiments are organized into four categories: 1) instrumented field sites, from which a steady stream of data will be continuously collected; 2) non-instrumented field sites which will rely upon portable monitoring equipment to collect data at discrete periods of time; 3) laboratory and/or greenhouse setups; and 4) new technology and ideas, which reflect new designs that are yet to be developed and tested. The experiment categories were determined by considering a number of factors including the quantity and quality of data that needs to be collected and the feasibility of collecting this data.

Prior to finalization of the protocol, DEP convened a peer review team of academic experts in GI monitoring. The team reviewed and provided comments on the protocol and experiments, which were presented and summarized at a public meeting on March 29, 2016.

Once the monitoring protocol was finalized, DEP developed detailed methodologies and collect data and/or conduct extensive literature review and surveys for specific experiments. Some of the work done in 2016 includes:

- Evaluation of existing sedimentation pretreatment technologies for bioretention facilities
- Collection of baseline data for indicators that may correlate with stormwater retention capabilities of rain gardens and/or plant health
- Simulated runoff tests for different rainfall events to observe performance of curb-cut inlets at different slopes

In 2016, the R&D Program continued to analyze the costs to design and construct green infrastructure projects, and to evaluate and advise on appropriate maintenance practices and protocols.

**2017 ACTION ITEM:** In 2017, DEP will continue setting up new experiments, collecting data and developing detailed methodologies for remaining experiments. These experiment topics include engineered soil, different planting schemes, and geotechnical investigation methodologies. In addition, work in 2017 will also expand studies and data collection for other types of green infrastructure practices including constructed wetlands, green roofs, and synthetic turf fields. Maintenance practices and protocols for right-of-way and on-site green infrastructure will be developed in 2017.



## Permeable Pavement Pilot Project – Local Law 80 of 2013

In 2013, the New York City Council passed Local Law 80 of 2013 requiring DEP and DOT to 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 CSO Tributary Areas and developed the monitoring protocol.

In 2016, an area in the Newtown Creek Priority CSO Tributary Area was identified for the third pilot area. It is currently undergoing preliminary screening work. Also in 2016, pre-construction data was collected as the designs for the porous pavement installations were finalized.

**2017 ACTION ITEM:** Construction for two of the three pilot areas (Bronx and Queens) is expected to be complete in 2017. Finalized designs and pre-construction monitoring is anticipated for the third pilot area. DEP and DOT will submit a report summarizing progress and data collected to-date on permeable pavement to City Council in early 2017. A final report will be prepared by DEP and DOT after post-construction data is collected and analyzed.

## Exhibits

### EXHIBIT A – 2016 Meetings and Presentations

2016 Quarter	Date	Community Members	Type of Outreach	Approx. Attendees
Q1	1/8	S.W.I.M.	Meeting	3
Q1	2/12	Barclays/Columbia SIPA	Presentation	10
Q1	2/25	Connecting Delta Cities Webinar on Co-benefits	Presentation	20
Q1	3/2	Green Infrastructure Grant Workshop	Presentation	40
Q2	4/1	NY Law School Rooftops Conference	Presentation	40
Q2	4/6	Queens CB 5 District Service Cabinet	Meeting	15
Q2	4/26	Queens CB 2 District Service Cabinet	Meeting	15
Q2	5/4	Newtown Creek Community Advisory Group	Meeting	30
Q2	5/24	Parks without Borders Conference	Presentation	30
Q2	5/25	Green Infrastructure Grant Workshop	Presentation	40
Q2	6/1	Queens CB 5 District Service Cabinet	Meeting	15
Q2	6/7	Brooklyn Grange Sustainability and Stormwater Management Teacher's Workshop	Presentation	15
Q2	6/14	Queens CB 9 Meeting	Presentation	20
Q2	6/16	NYCHA Edenwald Tenants Association	Presentation	10
Q2	6/16	Wakefield Taxpayers Association	Presentation	40
Q2	6/29	S.W.I.M. Public Meeting	Meeting	25
Q3	7/5	S.W.I.M.	Meeting	6
Q3	7/8	Chinese Business Delegation	Presentation	15
Q3	7/25	Senator Tony Avella	Meeting	5
Q3	7/27	J.H.S. 185Q Staff and Students	Playground Opening	200
Q3	8/1	Council Member Andy King	Meeting	5
Q3	8/4	Bioswale Stewardship Roundtable	Meeting	20
Q3	8/11	Hudson Estuary Program Citizen Advisory Committee	Presentation	25
Q3	9/7	Assembly Member Edward Braunstein	Meeting	5
Q3	9/8	Assembly Member Michael Simanowitz	Meeting	5
Q3	9/19	HEP Innovative Approaches to Managing Stormwater: Lessons from NJ, NY and Rotterdam	Presentation	25
Q3	9/20	Council Member Rosie Mendez, PS 15 M Staff and Students	Playground Opening	150
Q3	9/22	NYCSWCD Green Infrastructure Bus Tour	Tour	50
Q3	9/21	Green Infrastructure Grant Workshop	Presentation	?
Q3	9/26	Bioswale Meeting with Senator Avella, Assembly Member Simanowitz and Northeast Queens Civic Associations	Meeting	50
Q3	Multiple	Next Generation NYCHA Sustainability Kick-Off Meetings with Staff and Tenant Association members	Site Visit	Varied
Q3	Multiple	Borough FY 2018 Budget Consultations	Presentation	Varied
Q4	11/7	Queens Community Board 11 Green Infrastructure Meeting	Presentation	7
Q4	11/15	Queens Borough President Cabinet Meeting	Presentation	30
Q4	11/21	U.S. Forest Service Stewardship Mapping and Assessment Project Kickoff Meeting	Meeting	50
Q4	12/1	Bronx River Summit	Meeting	50
Q4	12/7	Green Infrastructure Grant Workshop	Presentation	35

## EXHIBIT B – Public Property Retrofits with the Department of Parks and Recreation

	Site Name	Status	Actual/Projected Completion Date
1	Reconstruction of the Playground Adjacent to P.S. 332 (Houston Playground)	Constructed	October, 2012
2	Powell Park Detention/Retention System	Constructed	September, 2016
3	Forest Park - Overlook Area / Park Lane / Permeable Paver Paths & Plaza	Constructed	December, 2015
4	Police Officer Nicholas Demutiis Park	In Construction	Fall 2017
5	Corona Golf Playground	In Design	Spring 2018
6	Annadale Playground / P.S. 175 Q Lynn Gross Discovery School	In Design	Fall 2018
7	Benninger Playground	In Design	Fall 2018
8	Carroll Park	In Design	Fall 2018
9	Ehrenreich-Austin Playground	In Design	Fall 2018
10	Forest Park - Union Turnpike / Metropolitan Ave	In Design	Fall 2018
11	Middle Village Playground	In Design	Fall 2018
12	Real Good Park	In Design	Fall 2018
13	South Pacific Playground	In Design	Fall 2018
14	The Painter's Playground / P.S. 174	In Design	Fall 2018
15	Magenta Playground Retrofit	In Design	Fall 2019
16	Mazzei Playground Retrofit	In Design	Fall 2019
17	Parkside Playground Retrofit	In Design	Fall 2019
18	Watson-Gleason Playground Retrofit	In Design	Fall 2019
19	Zimmerman Playground Retrofit	In Design	Fall 2019
20	Givan Square / Camponaro Playground	Preliminary	Spring 2018
23	Brevoort Playground (Brevoort Houses)	Preliminary	Fall 2018
24	Centreville Playground	Preliminary	Fall 2018
25	Havemeyer Playground	Preliminary	Fall 2018
26	Hoffman Park	Preliminary	Fall 2018
27	Jackie Robinson Park - Brooklyn	Preliminary	Fall 2018
28	Maria Hernandez Park	Preliminary	Fall 2018
29	Railroad Playground	Preliminary	Fall 2018
30	Sutter Ballfields	Preliminary	Fall 2018
31	Vito Locascio Field	Preliminary	Fall 2018
21	Howard Playground	Preliminary	Spring 2019
22	Van Dyke Playground (Van Dyke Houses)	Preliminary	Spring 2019
32	Barretto Park	Preliminary	Fall 2019
33	Belmont Playground	Preliminary	Fall 2019

34	Bridge Park 3 - East and West Retrofit	Preliminary	Fall 2019
35	Bulova Park Retrofit	Preliminary	Fall 2019
36	Ciccarone Park	Preliminary	Fall 2019
37	Crotona Parkway Malls @ E. 175th Retrofit	Preliminary	Fall 2019
38	Equity Park Retrofit	Preliminary	Fall 2019
39	Fairmount Playground	Preliminary	Fall 2019
40	Gorman Playground Retrofit	Preliminary	Fall 2019
41	Gun Hill Playground	Preliminary	Fall 2019
42	London Planetree Playground Retrofit	Preliminary	Fall 2019
43	Matthews Muliner Playground	Preliminary	Fall 2019
44	Vidalia Park	Preliminary	Fall 2019
45	Whalen Grove Retrofit	Preliminary	Fall 2019
<b>Jointly Operated Playgrounds (DOE/DPR)</b>			
46	Boerum Park / Cobble Hill School of American Studies	In Design	Fall 2018
47	Evergreen Playground / P.S. / I.S. 45 K Horace E. Greene	In Design	Fall 2018
48	P.S. 282 / Park Slope Playground	In Design	Fall 2018
49	Pinocchio Playground / I.S. 119 Q Glendale	In Design	Fall 2018
50	Rosemary's Playground	In Design	Fall 2018
51	Russell Sage Playground / J.H.S. 190 Q	In Design	Fall 2018
52	Tiger Playground / Evergreen Middle School for Urban Exploration (K562)	In Design	Fall 2018
53	Woods Playground / I.S. 335 Granville T Woods	In Design	Fall 2018
54	Caserta Playground / P.S. 106	Preliminary	Spring 2018
55	Castle Hill Playground / I.S. 127 X	Preliminary	Spring 2018
56	Bruckner Playground / I.S. 101 X	Preliminary	Fall 2018
57	Carver Playground / P.S. 40 K	Preliminary	Fall 2018
58	El Shabazz Playground / P.S. 262 K El Hajj Malik el Shabazz	Preliminary	Fall 2018
59	Eleanor Roosevelt Playground / P.S. 81	Preliminary	Fall 2018
60	Fermi Playground / I.S. 111 / I.S. 347 / I.S. 349 School for the Humanities	Preliminary	Fall 2018
61	Osborn Playground / P.S. 140 K / I.S. 275 K	Preliminary	Fall 2018
62	Chester Playground	Preliminary	Spring 2019
63	Dr. Richard Green Playground	Preliminary	Spring 2019
64	100% Playground Retrofit	Preliminary	Fall 2019
65	Bartlett Playground Retrofit	Preliminary	Fall 2019
66	Classon Playground (PS 270) Retrofit	Preliminary	Fall 2019
67	Ethan Allen Playground (PS 306) Retrofit	Preliminary	Fall 2019
68	Evergreen Park Retrofit	Preliminary	Fall 2019



69	Linden Park (Gershwin Park - J.H.S. 166)	Preliminary	Fall 2019
70	Oracle Playground (P.S. 46) Retrofit	Preliminary	Fall 2019
71	P.S. / I.S. 35 K and Decatur Playground Retrofit	Preliminary	Fall 2019
72	P.S. 127 Q / East Elmhurst Playground Retrofit	Preliminary	Fall 2019
73	Rienzi Playground / P.S. 21 X	Preliminary	Fall 2019
74	Rocket Park / J.H.S. 202 Robert H. Goddard PG Retrofit	Preliminary	Fall 2019

**EXHIBIT C – Public Property Retrofits with the Department of Parks and Recreation:  
Community Parks Initiative – Phases 1-3\***

	Site Name	Status	Phase	Borough
1	Hunts Point Playground	In Construction	Phase 1	Bronx
2	Lyons Square Playground	In Construction	Phase 1	Bronx
3	Playground 52	In Construction	Phase 1	Bronx
4	Ranaqua Park	In Construction	Phase 1	Bronx
5	Seabury Park	In Construction	Phase 1	Bronx
6	Saratoga Ballfields	In Construction	Phase 1	Brooklyn
7	Thomas Boyland Park	In Construction	Phase 1	Brooklyn
8	Carmansville Playground	In Construction	Phase 1	Manhattan
9	Henry M. Jackson Playground	In Construction	Phase 1	Manhattan
10	James Weldon Johnson Playground	In Construction	Phase 1	Manhattan
11	Martin Luther King Jr. Playground	In Construction	Phase 1	Manhattan
12	Playground 103 CIII	In Construction	Phase 1	Manhattan
13	Sol Lain Playground	In Construction	Phase 1	Manhattan
14	St. Nicholas Playground North	In Construction	Phase 1	Manhattan
15	Bowne Playground / Q020	In Construction	Phase 1	Queens
16	Grassmere Playground	In Construction	Phase 1	Queens
17	Van Alst Playground	In Construction	Phase 1	Queens
18	Arrochar Playground	In Construction	Phase 1	Staten Island
19	DeMatti Playground	In Construction	Phase 1	Staten Island
20	Grandview Playground	In Construction	Phase 1	Staten Island
21	Levy Playground	In Construction	Phase 1	Staten Island
22	McDonald Playground	In Construction	Phase 1	Staten Island
23	Little Claremont Park	In Design	Phase 1	Bronx
24	Longfellow Garden	In Design	Phase 1	Bronx
25	Ogden Plimpton Playground	In Design	Phase 2	Bronx
26	Saw Mill Playground	In Design	Phase 1	Bronx
27	Epiphany Playground	In Design	Phase 2	Brooklyn
28	Jesse Owens Playground	In Design	Phase 1	Brooklyn
29	Lt. Joseph Petrosino Park	In Design	Phase 2	Brooklyn
30	Newport Playground	In Design	Phase 2	Brooklyn

31	Stockton Playground / P.S. 297	In Design	Phase 1	Brooklyn
32	Ten Eyck Playground / P.S. 196	In Design	Phase 1	Brooklyn
33	Bloomingdale Playground	In Design	Phase 2	Manhattan
34	Stapleton Playground	In Design	Phase 2	Staten Island
35	Garrison Playground	Preliminary	Phase 3	Bronx
36	Playground 174 (Bronx River Houses)	Preliminary	Phase 3	Bronx
37	Playground One Thirty Four CXXXIV	Preliminary	Phase 3	Bronx
38	Plimpton Playground	Preliminary	Phase 3	Bronx
39	La Guardia Playground	Preliminary	Phase 3	Brooklyn
40	Abraham Lincoln Playground	Preliminary	Phase 3	Manhattan
41	Audubon Playground / P.S. 128	Preliminary	Phase 3	Manhattan
42	Almeda Playground	Preliminary	Phase 3	Queens

\*For more information on CPI Park status, please refer to Parks [Community Parks Initiative Capital Projects](#) and [Capital Project Tracker](#) webpages.

#### EXHIBIT D – Public Property Retrofits with the Department of Education

	Site Name	Status	Actual/Projected Completion Date
1	P.S./M.S. 194 Bronx	Constructed	August, 2015
2	P.S. 12 Q James Colgate	In Design	Fall 2018
3	P.S. 321 K William Penn	In Design	Fall 2018
4	P.S. 9 K Teunis Bergen / Brooklyn East Charter	In Design	Fall 2018
5	P.S. 91 Q Richard Arkwright	In Design	Fall 2018
6	P.S. 81 Q Jean Paul Richter	In Design	Spring 2019
7	Grand Street Campus (Old E.D.H.S.)	Preliminary	Fall 2018
8	I.S. 263 / 323 Mott Hall Bridges School	Preliminary	Fall 2018
9	P.S. 145 K / Andrew Jackson	Preliminary	Fall 2018
10	P.S. 165 K	Preliminary	Fall 2018
11	P.S. 178 K	Preliminary	Fall 2018
12	P.S. 183 K	Preliminary	Fall 2018
13	P.S. 233 K	Preliminary	Fall 2018
14	P.S. 299 K	Preliminary	Fall 2018
15	P.S. 309 K	Preliminary	Fall 2018
16	P.S. 328 K Phyllis Wheatley	Preliminary	Fall 2018
17	P.S. 5 K	Preliminary	Fall 2018
18	PS 178 Annex	Preliminary	Fall 2018

19	Thomas Jefferson High School	Preliminary	Fall 2018
20	East New York Vocational H.S. of Transit Tech - K	Preliminary	Spring 2019
21	Evander Childs H.S. - X	Preliminary	Spring 2019
22	High School Suspension Center	Preliminary	Spring 2019
23	P.S. 103 X	Preliminary	Spring 2019
24	P.S. 108 X	Preliminary	Spring 2019
25	P.S. 13 K	Preliminary	Spring 2019
26	P.S. 159 K	Preliminary	Spring 2019
27	P.S. 174 K	Preliminary	Spring 2019
28	P.S. 202 K	Preliminary	Spring 2019
29	P.S. 213 K	Preliminary	Spring 2019
30	P.S. 72 K	Preliminary	Spring 2019
31	P.S. 76 X	Preliminary	Spring 2019
32	P.S. / I.S. 210 Q	Preliminary	Fall 2019
33	P.S. 7 K	Preliminary	Fall 2019
34	P.S. 97 Q	Preliminary	Fall 2019
35	Bronx H.S. for the Visual Arts	Preliminary	Fall 2020
36	Christopher Columbus H.S. Campus	Preliminary	Fall 2020
37	Grace H. Dodge Voc. H.S. - X	Preliminary	Fall 2020
38	I.S. 135 - D. Whalen J.H.S.	Preliminary	Fall 2020
39	P.S. 6 X	Preliminary	Fall 2020
40	P.S. 78 X	Preliminary	Fall 2020
41	P.S. 83 X - Donald Hertz School	Preliminary	Fall 2020
42	P.S. 89 X	Preliminary	Fall 2020

**EXHIBIT E – Public Property Retrofits with the Department of Education and the Trust for Public Land: Schoolyards to Playgrounds**

	Site Name	Status	Actual/Projected Completion Date
1	JHS 218K	Constructed	September, 2013
2	PS 261K	Constructed	September, 2013
3	PS 65K	Constructed	September, 2013
4	JHS 157Q	Constructed	September, 2014
5	JHS 162K	Constructed	September, 2014
6	CS 300/ IS 129/ IS 316X	Constructed	June, 2015
7	JHS 185Q	Constructed	June, 2016
8	PS 15M	Constructed	September, 2016
9	PS 75Q	Constructed	September, 2016

10	P.S. 184 M / P.S. 137 M	In Design	Spring 2018
11	PS 154M	In Design	Spring 2018
12	PS 71K	In Design	Spring 2018
13	PS 120Q	In Design	Fall 2018
14	I.S. 250 Q	In Design	Spring 2019
15	IS 581K	In Design	Spring 2019
16	PS/JHS 189Q	In Design	Spring 2019
17	P.S. 2 M	In Design	Fall 2019
18	P.S. 33 M	Preliminary	Spring 2020
19	P.S. 295 K Brooklyn/I.S. 88K (DOE side only)	Preliminary	Spring 2020
20	P.S. 221 Q	Preliminary	Spring 2020

#### EXHIBIT F – Public Property Retrofits with NYC Housing Authority

	Site Name	Status	Actual/Projected Completion Date
1	Bronx River	Constructed	November, 2010
2	Hope Gardens (Demonstration Project)	Constructed	September, 2013
3	Seth Low (Demonstration Project)	Constructed	September, 2013
4	Edenwald (North & South)	In Construction	Fall 2017
5	Gowanus Houses	In Construction	Fall 2018
6	Wyckoff Houses	In Design	Spring 2019
7	Kingsborough Houses	In Design	Spring 2019
8	Howard Houses	Preliminary	Spring 2019
9	Garvey (Group A)	Preliminary	Spring 2019
10	Glenmore Plaza	Preliminary	Spring 2019
11	Brevoort	Preliminary	Spring 2019
12	Saratoga Village	Preliminary	Spring 2019
13	Roosevelt I / II	Preliminary	Spring 2019
14	Bushwick II (Group E)	Preliminary	Spring 2019
15	Hope Gardens	Preliminary	Spring 2019
16	Glebe-Westchester	Preliminary	Spring 2019
17	Brownsville	Preliminary	Summer 2019
18	Seth Low Houses	Preliminary	Summer 2019
19	Van Dyke I / II	Preliminary	Summer 2019
20	Tilden	Preliminary	Summer 2019
21	Bushwick II (Group A and C)	Potential	Fall 2019
22	Bushwick II (Group B and D)	Potential	Fall 2019
23	Throggs Neck	Potential	Fall 2019
24	Eastchester Gardens	Potential	Fall 2019

25	Gun Hill	Potential	Fall 2019
26	Murphy	Potential	Fall 2019
27	Twin Parks East (Site 9)	Potential	Fall 2019
28	Parkside	Potential	Fall 2019
29	Boston Road Plaza	Potential	Fall 2019
30	Pelham Parkway	Potential	Fall 2019
31	Linden Houses	Potential	Fall 2019
32	Pennsylvania-Wortman Ave	Potential	Fall 2019
33	Boulevard Houses	Potential	Fall 2019
34	Fiorentino Plaza	Potential	Fall 2019
35	Cypress Hills	Potential	Fall 2019
36	East New York City Line	Potential	Fall 2019
37	Belmont-Sutter Area	Potential	Fall 2019
38	Pink Houses	Potential	Fall 2019
39	South Jamaica Houses	Potential	Fall 2019

**EXHIBIT G – Public Property Retrofits with the Department of Design & Construction: Public Buildings**

	Site Name	Status	Actual/Projected Completion Date
1	Flushing Town Hall	Constructed	September, 2016
2	Brooklyn Public Library - Windsor Terrace	In Construction	Fall 2018
3	Brooklyn Public Library - Greenpoint	In Design	Spring 2019
4	Taxi & Limousine Commission	Potential	Spring 2020



## EXHIBIT H – Public and Private Property Retrofits in the 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	Wildlife Conservation Society (Bronx Zoo)	Bronx	Constructed	August, 2016
17	The Church of St. Luke & St. Matthew	Brooklyn	Constructed	September, 2016
18	New York Botanic Garden	Bronx	Constructed	November, 2016
19	New York University Langone Medical Center	Manhattan	Constructed	November, 2016
20	South Bronx Economic Development Corporation - Jasmine Court	Bronx	In Construction	Spring 2017
21	South Bronx Economic Development Corporation - Venture Center	Bronx	In Construction	Spring 2017
22	Salmar Building	Brooklyn	In Design	Spring 2017
23	Montefiore Medical Center-Wakefield Campus	Bronx	In Design	Summer 2017
24	Pratt Institute	Brooklyn	In Design	Summer 2017
25	Queens College Dining Hall	Queens	In Design	Summer 2017
26	Bedford Stuyvesant Restoration	Brooklyn	In Design	Fall 2017
27	Gowanus Arts	Brooklyn	In Design	Fall 2017
28	Montefiore Medical Center-Moses Campus	Bronx	In Design	Fall 2017
29	Two Bridges Neighborhood Council	Manhattan	In Design	Fall 2017
30	Paradise Garden	Bronx	In Design	Fall 2017
31	Sugar Hill Co-op	Manhattan	In Design	Fall 2017
32	Hayden on the Hudson	Bronx	In Design	Fall 2017
33	Lafayette Development LLC	Manhattan	In Design	Fall 2017
34	Citylights	Queens	In Design	Fall 2017

