**New York State Office of the State Comptroller**
Thomas P. DiNapoli

Division of State Government Accountability

# Monitoring the Green Innovation Grant Program

## Environmental Facilities Corporation

Report 2017-S-19 June 2018

# Executive Summary

## Purpose

To determine if the Environmental Facilities Corporation (Corporation) is effectively monitoring projects awarded under the Green Innovation Grant Program (GIGP), and if grant recipients are substantively completing projects per project agreements and meeting post-construction requirements. The audit covered the period January 1, 2010 through September 20, 2017.

## Background

The Corporation is a public benefit corporation whose environmental initiatives extend both financial and technical assistance to municipalities, non-profits, and small businesses, ensuring they meet water and air quality regulations. One program the Corporation administers is the GIGP, which supports projects across New York State that utilize unique stormwater infrastructure design and create cutting-edge green technologies.

Green infrastructure practices treat rainwater as a valuable resource to be harvested and used on site, or filtered and allowed to soak back into the ground, recharging aquifers, rivers, and streams. Green stormwater infrastructure includes a wide array of practices, at multiple scales, that manage wet weather and maintain and restore natural hydrology by harvesting and using stormwater. On a regional scale, green infrastructure is the preservation and restoration of natural landscape features, such as forests, floodplains, and wetlands. On the local scale, green infrastructure consists of site- and neighborhood-specific practices, such as bioretention, trees, green roofs, permeable pavements, and cisterns.

In their grant application, grantees describe how they plan to maintain their project, which the Corporation considers as part of its award process. Once awarded a GIGP grant, grantees must be in compliance with provisions of the Corporation's grant agreement (Agreement). Among the requirements, grantees must: design the project in accordance with the Department of Environmental Conservation's New York State Stormwater Management Design Manual; provide the Corporation with site photographs, showing project progression at 30, 60, and 90 percent completion; properly maintain and operate the project; and install informative signs at project sites. According to its Rules and Regulations, the Corporation may conduct reviews and inspections to ensure compliance with the Agreement as well as federal and State requirements. From the GIGP's inception in 2009 through the end of 2016, the Corporation has awarded $135 million for 167 selected projects representing every region of the State.

## Key Findings

- The Corporation monitors some aspects of the projects by frequent communication with grantees, receiving progress photographs, and reviewing fiscal documentation to monitor project progression.
- The Corporation's on-site monitoring of the projects we sampled frequently occurred later in the construction cycle than the Corporation's goal of between 50 and 75 percent completion. Also, the Corporation does not perform site visits after project completion to determine if the grantee is properly maintaining the project and has installed the required signage.

- Our site visits to a sample of 16 projects found that five grantees were not consistently maintaining their project, thereby weakening the effect of the project, and three grantees did not comply with the requirement to install interpretive signs for the project. Additionally, several grantees did not measure project performance consistent with the practices they described in their grant applications.

## Key Recommendations

- Implement steps to increase the completion of site visits made during the 50 to 75 percent completion window.
- Develop and implement a plan for post-construction monitoring of grantees' compliance with requirements for project maintenance, signage, and, when applicable, performance monitoring consistent with their grant application. Such monitoring should be performed for at least a sample of projects, based on factors determined by the Corporation, and consider the use of various methods such as site visits and review of grantee documentation.
- Remind grantees of their responsibility to maintain their projects, install signs, and monitor project performance consistent with their grant application.

# State of New York
# Office of the State Comptroller

## Division of State Government Accountability

June 20, 2018

Mr. Basil B. Seggos
Chairman
Environmental Facilities Corporation
625 Broadway #7
Albany, NY 12207

Dear Chairman Seggos:

The Office of the State Comptroller is committed to helping State agencies, public authorities, and local government agencies manage government resources efficiently and effectively and, by doing so, providing accountability for tax dollars spent to support government operations. The Comptroller oversees the fiscal affairs of State agencies, public authorities, and local government agencies, as well as their compliance with relevant statutes and their observance of good business practices. This fiscal oversight is accomplished, in part, through our audits, which identify opportunities for improving operations. Audits can also identify strategies for reducing costs and strengthening controls that are intended to safeguard assets.

Following is a report of our audit entitled *Monitoring the Green Innovation Grant Program*. Our audit was performed pursuant to the State Comptroller's authority as set forth in Article X, Section 5 of the State Constitution and Section 2803 of Public Authorities Law.

This audit's results and recommendations are resources for you to use in effectively managing your operations and in meeting the expectations of taxpayers. If you have any questions about this report, please feel free to contact us.

Respectfully submitted,

*Office of the State Comptroller*
*Division of State Government Accountability*

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# Background

The Environmental Facilities Corporation (Corporation) is a public benefit corporation whose mission is to assist communities throughout New York State undertake critical water quality infrastructure projects by providing access to low-cost capital, grants, and expert technical assistance. The Corporation administers the State's Clean Water State Revolving Fund (CWSRF). The majority of CWSRF funds are provided as financial assistance to municipalities for water quality-related infrastructure construction projects. The Corporation uses CWSRF funds for the Green Innovation Grant Program (GIGP) to support projects that use unique green stormwater infrastructure and create cutting-edge green technologies. With increasing urbanization, stormwater has become a major cause of water pollution in urban areas. Where there are expansive areas of impervious surfaces, rainfall is not allowed to naturally soak into the ground, creating stormwater runoff that washes pollutants into nearby rivers, lakes, and estuaries.

To address the stormwater runoff, GIGP grants provide funds toward eight specific green infrastructure practices (see Exhibit A for a glossary of terms from the Corporation's website):

- Bioretention (e.g., rain gardens);
- Construction or restoration of wetlands, floodplains, or riparian buffers;
- Downspout disconnection (redirect roof runoff from storm sewer to vegetated pervious area);
- Green roofs and green walls;
- Permeable pavement (e.g., porous asphalt, concrete, pavers);
- Stormwater harvesting and reuse (e.g., rain barrel and cistern projects);
- Stormwater street trees/urban forestry programs designed to manage stormwater; and
- Stream daylighting.

These practices treat rainwater as a valuable resource to be harvested and used on site, or filtered and allowed to soak back into the ground, recharging aquifers, rivers, and streams. They can also help beautify streets and neighborhoods, improve property values, revitalize downtowns, and improve the overall quality of life.

In their grant application, grantees describe how they plan to maintain their project, which the Corporation considers as part of its award process. Once awarded a GIGP grant, grantees must be in compliance with provisions of the Corporation's grant agreement (Agreement), including but not limited to:

- Design the project in accordance with the Department of Environmental Conservation's New York State Stormwater Management Design Manual (Design Manual);
- Ensure the proper and efficient operation and maintenance of the project;
- Obtain Corporation approval of project contractors; and
- Provide the Corporation with site photographs, showing project progression at 30, 60, and 90 percent completion.

Additionally, as of 2010, grantees must also install informative signs at project sites. Since 2012, the Corporation's written expectation is that the signage be installed within 90 days after final project acceptance.

To assist grantees in monitoring their projects and ensure they are meeting performance estimates, the Corporation created its Guidance for Green Infrastructure Monitoring (GI Guidance). The GI Guidance lists minimum recommendations for green infrastructure monitoring (i.e., measuring) for each of the eight green infrastructure practices it provides funding for. If grantees seek it, the Corporation will provide funds toward certain monitoring activities for up to three years post-construction.

The Corporation's Rules and Regulations state that it may conduct reviews and inspections to ensure compliance with Agreement provisions as well as federal and State requirements. The Corporation monitors project progression throughout the construction phase, through either communication with grantees or on-site inspections. According to Corporation officials, their goal is to visit each project site at least once when the project is between 50 and 75 percent complete. Corporation staff conduct some visits, but most are completed by a consultant engineering and construction firm.

Grantees submit payment requisitions throughout the duration of the Agreement. Requisitions are paid subject to grantees' compliance with the terms of the Agreement. Grantees are also to provide the Corporation with cost invoices and proof of payment of those invoices within 45 days of receiving the advance from the Corporation. Final disbursements are made once the Corporation receives a Certificate of Substantial Completion, signed by the grantee's engineer, and a Certificate of Project Completion, signed by a grantee representative.

From the Program's inception in 2009 through 2016, the Corporation has awarded $135 million for 167 selected GIGP projects representing every region of the State, as shown in Exhibit B.

# Audit Findings and Recommendations

The Corporation properly monitors some aspects of the projects, but needs to improve its monitoring in other areas. For example, the Corporation communicates frequently with grantees, receives progress photographs, and reviews fiscal documentation to monitor project progression. However, we found its on-site monitoring of the projects we sampled was frequently completed later in the construction cycle than its goal of between 50 and 75 percent completion. Additionally, there are no site visits subsequent to project completion to determine if the projects are being properly maintained, signs have been installed as required, and the grantee is monitoring project performance, when applicable. Based on our site visit observations and discussions with grantees, we found that some grantees were only maintaining some components of their project or only partially maintaining the green component in accordance with the Design Manual. Improperly maintained projects are at increased risk of underperforming.

## Corporation Project Monitoring

The Corporation's monitoring procedures focus on ensuring active projects are moving forward and being completed. Based on our sample results, we found the Corporation communicates with the grantees frequently throughout the project, obtains photos from grantees of project progress, and makes at least one visit during project construction. However, we found the Corporation could improve its monitoring in certain areas, including the timing of some visits to projects and monitoring of project maintenance and performance after project completion. For example, we identified a moderately significant maintenance issue at one project, and relatively minor workmanship and maintenance issues at four other projects. Additionally, three grantees did not comply with the requirement to install interpretive signs for their project.

### *Construction Oversight*

We reviewed the Corporation's communication logs for 15 of the 16 GIGP project sites we selected. (We did not review the logs for one project because the Corporation terminated the grant during our audit period. Corporation officials told us the grant was subsequently reinstated.) We determined the Corporation communicated frequently with grantees to obtain updates on project progress as well as other information (e.g., photographs, grantee payment requests) and to address issues that arise. Additionally, the Corporation compiled more than 1,100 photographs related to the 16 GIGP project sites we reviewed, an average of approximately 69 photographs per project. In many cases, grantees sent in photos more frequently than at the three required intervals, as evidenced by the dates of the photos. The photos generally show progress on the respective projects, but could be more informative if they were labeled with the estimated percentage of completion. However, we found no documentation that grantees' construction managers notified the Corporation when the project was 30, 60, and 90 percent complete, as required.

The Corporation's goal is to make a site visit to each project at the mid-construction point (50–75 percent completion). All ten completed projects from our sample were visited at least once,

but, according to the inspection reports, only two (City of Rensselaer and Buffalo Neighborhood Stabilization Company [BNSC]) were visited at or close to the 50 to 75 percent completion stage. Of the remaining eight, seven were not visited until near the end of the project. Likewise, the two active projects that were at least 50 percent complete at the time of our visit were not inspected until they were 95 percent complete (Albany Water Board) and 98 percent complete (Town of Lake George). When inspections are delayed until the final stages of construction, there is an increased risk that the Corporation may not identify and address any issues (e.g., construction errors) that occurred earlier in construction. Such issues could jeopardize or reduce the project's effectiveness.

### *Post-Construction Oversight*

Once the Corporation receives the Certificate of Substantial Completion and the Certificate of Project Completion forms from the grantee, it makes the final disbursements and closes out the project. Corporation officials stated that they might visit a site post-construction if they are in the vicinity. However, the Corporation does not routinely continue to actively monitor completed projects through site visits or by obtaining other evidence to determine if the projects are properly maintained and performing as expected and educational signs have been posted, as required. Grantees for the ten completed projects we visited told us the Corporation had not conducted a post-construction visit or requested information about the project's performance. This post-construction oversight is important to ensure the integrity of the project is retained and not allowed to deteriorate.

### *Site Visits to Sampled Projects*

During the award process, grantees must provide information on project maintenance. Additionally, the Agreement requires grantees to maintain the project and maintain title or other property rights to ensure use of the project over the term of the Agreement. The Corporation also reminds grantees that they are required to maintain their project site. To determine whether the grantees were operating and maintaining the projects as required, we toured 15 of the 16 project sites in our sample to observe the level of maintenance of the project. (We did not tour the Cayuga County project because it was at a remote site of a lake.) We also talked to grantee staff about what their project was trying to accomplish and any issues they encountered. At the completed projects, we also discussed project maintenance.

Based on our site visit observations, we found that some grantees were only maintaining some components of their project or only partially maintaining the green component in accordance with the Design Manual. As discussed next, we identified a moderately significant maintenance issue at NYC Department of Parks and Recreation (Parks)-Bronx as well as other, albeit relatively minor, workmanship and maintenance issues at Bard College, Town of Brighton, Town of Brookhaven, and BNSC that, if not corrected, could lead to more significant concerns:

- NYC Parks-Bronx (active): We observed that the green roof plant membrane that holds the plantings together was showing through the soil (Figure 1A), and the containment mats used to anchor the plantings and retain the soil were out of place, allowing soil

to wash down the drain (Figure 1B). The soil erosion could lead to damage to the plants' development and their root system necessary to absorb the rainwater, thereby compromising the benefit of this project.

**Figure 1 -** NYC Parks-Bronx

A B

- Bard College (completed): A small section (less than 5 percent) of the porous pavement parking lot was completed using non-porous materials, thus preventing water from infiltrating the pavement as intended.
- Town of Brighton (active): Adjoining landowners had seal-coated over a small section of porous pavement installed under the grant. Also, subsequent to a water main break, the Town had replaced a small section of porous sidewalk with non-porous materials (Figure 2). According to Corporation officials, after our site visit, the grantee subsequently made repairs with porous materials.

**Figure 2** - Town of Brighton

- Town of Brookhaven (completed): Sand had built up on a small section of the porous interlocking pavers (Figure 3), which may inhibit some water from permeating the pavement.

**Figure 3** - Town of Brookhaven

- BNSC (completed): Two rain gardens were severely overgrown (Figure 4A-B), one of which had debris such as tires and plywood dumped in it. It is unclear what effect, if any, the overgrowth may have on the functionality of the project. However, the unsightly appearance seems contrary to one of the Corporation's stated benefits of such projects: to help beautify streets and neighborhoods. Although BNSC's application stated that it intended to have long- term ownership or maintenance agreements to address its projects through their useful life, officials told us they do not maintain the project because they do not own it, which is contrary to both Agreement requirements and the statements in the application. There appears to be confusion between the grantee and the landowner as to which party will perform the necessary project maintenance.

**Figure 4** - BNSC

A B

In their applications, grantees describe how they plan to maintain their project, which the Corporation considers as part of its award process. However, four grantees (City of Rensselaer, NYC Parks-Brooklyn, Onondaga County, and Village of Lake Placid) did not provide specifics on how they would maintain their project, only which components would be maintained or who would maintain them. Additionally, grantees and the individuals ultimately responsible for maintenance do not receive formal Design Manual maintenance training.

Corporation officials explained that most of the issues we identified are minor, and do not present long-term obstructions to functionality. They also stated that green infrastructure is a relatively

new technology, and as a result, grantees' maintenance crews may not be aware of proper maintenance procedures for their green project. Although most of the issues we identified are relatively minor, there is an increased risk that other projects could have deficiencies that will not be detected and corrected unless post-construction site visits or other verification methods are used for at least a sample of some projects.

### *Educational Signage*

In 2012, the Corporation issued its Interpretive Sign Development Guidance manual to help grantees meet the requirement to install signs at project sites to inform the public about the projects and their green innovation objectives. The signs are to be posted within 90 days after final project acceptance. The ten completed project sites we sampled are required to install signs; however, three (Office of Parks and Recreation and Historic Preservation, Onondaga County, and Village of Lake Placid) did not have interpretive signs posted at the time of our visits despite having been completed for more than a year. The remaining seven projects had an interpretive sign or provided information about the project through a different medium that we concluded adequately met the intent of the requirement. At one active project, officials indicated to us that signage is an option and not a requirement – a lack of awareness that suggests some grantees may not have knowledge of the sign requirement.

### *Fiscal Monitoring*

We found that the Corporation is adequately monitoring the payment of grantee requisitions, and has appropriate controls in place to ensure that only eligible costs are included and that payment requisitions are processed and paid in a timely manner. For example, Corporation staff review payment requests to ensure that the required documentation is in order and that items being claimed for reimbursement are eligible under the GIGP. The Corporation's electronic payment system is configured to track each payment to a grantee based on the amount the Corporation authorized. These controls allow payments only for approved contractors, for costs that were incurred and paid by the grantee, and for GIGP-eligible items.

For 14 projects, we reviewed 34 payment requisitions, including the first and last requisitions for each project as well as four miscellaneous requisitions, totaling more than $5.3 million. For these 14 projects, we determined that each requisition was supported with appropriate documentation, such as copies of invoices issued by Corporation-approved contractors and either a corresponding canceled check or an explanation why the Corporation did not require a canceled check. For three requisitions, the Corporation disallowed over $37,000 of ineligible costs. On average, for the 30 first and last payment requisitions of our sample, the Corporation issued payments within 20 days of the grantee submitting the requisition. Only four of the 30 requests were paid later than 30 days. (We did not review financial records for the remaining two projects: the Town of Brighton project, because it was temporarily terminated during a portion of our audit period and subsequently reinstated, and the Town of Lake George project, because the Department of Transportation was the project manager due to the project site location and was responsible for arranging payment to the contractor that performed the GIGP construction.)

## Project Performance Measurement

The Corporation issued its GI Guidance to assist grant recipients with developing a pre- and post-construction monitoring program. The guidance contains minimum recommendations for monitoring by type of practice, such as measuring outlet flows and contaminant concentrations for permeable pavers and green roof and green wall projects and measuring outlet flow for downspout disconnects and stormwater harvest and reuse. The guidance also indicates that some practices are not suitable for all types of monitoring, and that when measuring the reduction in volume of water achieved by the project, it should have a defined and accessible inlet and outlet. Although a monitoring plan is a factor the Corporation uses to score grantee applications, the grantees are not required to monitor project performance unless the Corporation has agreed to fund the costs for monitoring.

For 12 of the 16 projects we sampled, including eight completed and four active, the grantees indicated that they either are not or will not be monitoring project performance. For 10 grantees (of eight completed and two active projects), this is contrary to their grant application, which had stated their planned intent to monitor the performance of their project. For example, in its application, the City of Rensselaer said it would take measurements of flow and water quality on an ongoing basis. Although project officials expressed to us that the project is doing what it was intended, they have not measured it. Likewise, the Village of Gouverneur stated in its application that its water quality monitoring included sampling at three different river locations triggered by specific weather-related conditions, yet officials told us that the Village does not plan to measure the quality or quantity of outputs for the project.

At the remaining four projects we sampled, including two completed and two active, the grantees are monitoring at least some performance aspect of their projects, or will have the ability to do so when the project is completed. The grantees of the two completed projects (City of Yonkers and Town of Brookhaven) are both conducting post-construction monitoring of their project's performance. For one active project, the grantee (NYC Parks-Bronx) requested funds from the Corporation for monitoring activities, and therefore is required to monitor project performance. We found the grantee is following the Corporation's preferred practice, and has plans to obtain water flow measurements both pre- and post-construction. For the remaining active project, even though the application did not ask the grantee (Albany Water Board) to provide a monitoring plan, the grantee has the ability to calculate how much water the project keeps out of a creek, but does not have the ability to measure the reductions in bacteria in the water despite its feasibility study indicating it intended to reduce bacteria conveyed to the river.

Corporation officials told us that since GIGP projects are designed in accordance with the Design Manual, and by qualified professionals using sophisticated software, the calculations presented for the project design are factual and a true representation of the actual results on site. The Corporation states that there have been numerous case studies and research demonstrating that green infrastructure is an effective tool to combat stormwater runoff. However, the Corporation should have some check in place to determine if grantees are fulfilling the claims they made in their applications.

## Recommendations

1. Implement steps to increase the completion of site visits during the 50 to 75 percent completion window.

2. Develop and implement a plan for post-construction monitoring of grantee compliance with requirements for project maintenance, signage, and, when applicable, performance monitoring consistent with their application. The Corporation should perform such monitoring for at least a sample of projects, based on factors determined by the Corporation, and consider the use of various methods such as site visits and review of grantee documentation.

3. Remind grantees of their responsibility to maintain their projects, install signs, and monitor project performance consistent with their applications.

# Audit Scope, Objectives, and Methodology

Our performance audit determined whether the Corporation is effectively monitoring projects awarded under the GIGP, and whether the grantees are substantively completing projects per their Agreement and meeting post-construction requirements. The audit covered the period from January 1, 2010 through September 20, 2017.

To accomplish our objectives, and assess the adequacy of the Corporation's internal controls as they related to their performance and our audit objectives, we reviewed relevant laws, regulations, and Corporation guidance. We met with key Corporation personnel to obtain an understanding of the GIGP. To obtain information about the projects, we met with select GIGP grantees and visited their project sites. We also reviewed project files held by both the Corporation and the grantees. We communicated our findings to Corporation management, and considered information they provided through September 20, 2017.

To determine which project sites to visit, we analyzed grant data for rounds two through eight to identify risk areas, and then used the analysis to judgmentally select our sample. We eliminated round one projects because those awards were provided under the American Recovery and Reinvestment Act, and therefore guiding laws and regulations might differ from what is currently in effect. In selecting sites to visit, we considered risks based on, but not limited to, the following areas:

- Days since project completion;
- Length of time to complete the project;
- Time to start of construction exceeding two years;
- Multiple eligible green infrastructure components included in project;
- Date of certification of project completion is prior to the certification of substantial completion; and
- Dollar amount of the project.

Thereafter, we judgmentally selected grantees based on geographic location and considered the population, so that we achieved a diverse spread of projects and were able to visit different regions throughout the State, including downstate, upstate, central, and western New York. We conducted site visits to a sample of 16 projects awarded a total of $17,559,407, of which ten were completed and six were active, as shown in the following table. Project descriptions are provided in Exhibit C.

| Grantee | County | Award Amount | Project Status | Award Year |
|---|---|---|---|---|
| Albany Water Board | Albany | $450,000 | Active | 2015 |
| Bard College | Dutchess | 732,728 | Completed | 2013 |
| BNSC | Erie | 644,268 | Completed | 2012 |
| Cayuga County | Cayuga | 712,500 | Active | 2010 |
| City of Rensselaer | Rensselaer | 850,500 | Completed | 2012 |
| City of Yonkers | Westchester | 921,425 | Completed | 2012 |
| NYC Parks-Bronx | Bronx | 1,125,000 | Active | 2011 |
| NYC Parks-Brooklyn | Kings | 2,287,000 | Completed | 2011 |
| Office of Parks and Recreation and Historic Preservation | Nassau | 800,000 | Completed | 2013 |
| Onondaga County | Onondaga | 819,000 | Completed | 2011 |
| Syracuse University | Onondaga | 1,350,000 | Completed | 2012 |
| Town of Brighton | Monroe | 1,565,000 | Active | 2011 |
| Town of Brookhaven | Suffolk | 1,750,480 | Completed | 2012 |
| Town of Lake George | Warren | 544,500 | Active | 2012 |
| Village of Gouverneur | St. Lawrence | 1,995,000 | Active | 2011 |
| Village of Lake Placid | Essex | 1,012,006 | Completed | 2012 |
| **Total** | | **$17,559,407** | | |

We judgmentally selected active projects that were open for a long period of time (i.e., years). Through our review, we found that generally they were open for longer periods due to permitting issues or issues securing access to project sites. Given the oversight that is necessary from various regulatory agencies and authorities involved on certain projects, these types of delay issues are reasonable to expect.

During our site visits, we discussed the grant process with grantees as well as their interaction with the Corporation, which included: the application component through the end-of-project close-out when the final inspection was done; discussion of the green infrastructure project itself and any issues that arose throughout construction either with a contractor or the Corporation; and any problems that occurred either jurisdictionally or with the Corporation that impeded the process. We assessed grantees' development and operation of the project by reviewing pertinent documentation for both programmatic and fiscal aspects. This included reviewing documents such as: the consolidated funding application; the feasibility study; the executed Agreement; and documentation to support the first and last payment requisitions. In addition, whenever possible, we toured project sites to observe the site conditions and to increase our understanding of how the project was working.

We also assessed the award/scoring process for assurance it was a fair process. Our assessment found that overall it was a fair process, and we did not identify any material issues that would have required us to report.

We conducted our performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

In addition to being the State Auditor, the Comptroller performs certain other constitutionally and statutorily mandated duties as the chief fiscal officer of New York State. These include operating the State's accounting system; preparing the State's financial statements; and approving State contracts, refunds, and other payments. In addition, the Comptroller appoints members to certain boards, commissions, and public authorities, some of whom have minority voting rights. These duties may be considered management functions for purposes of evaluating threats to organizational independence under generally accepted government auditing standards. In our opinion, these functions do not affect our ability to conduct independent audits of program performance.

# Authority

Our audit was performed pursuant to the State Comptroller's authority as set forth in Article X, Section 5 of the State Constitution and Section 2803 of Public Authorities Law.

# Reporting Requirements

A draft copy of this report was provided to Corporation officials for their review and formal comment. Their comments were considered in preparing this final report and are attached at the end in their entirety, along with our State Comptroller's Comment, which addresses some of the Corporation's statements. The Corporation agreed with two of our recommendations and indicated steps it took to implement them. The Corporation generally disagreed with our recommendation to increase inspections of projects during the 50 to 75 percent of completion window per its guidelines. Corporation officials stated they believe they have adequate procedures to monitor projects throughout construction.

Within 90 days of the final release of this report, as required by Section 170 of the Executive Law, the Chairman of Environmental Facilities Corporation shall report to the Governor, the State Comptroller, and the leaders of the Legislature and fiscal committees, advising what steps were taken to implement the recommendations contained herein, and where the recommendations were not implemented, the reasons why.

# Contributors to This Report

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## Vision

A team of accountability experts respected for providing information that decision makers value.

## Mission

To improve government operations by conducting independent audits, reviews, and evaluations of New York State and New York City taxpayer-financed programs.

# Exhibit A

## GIGP – Glossary of Terms

**Bioretention:** A system of shallow vegetated depressions designed to collect water in the depression where it ponds on the surface; intended to remove pollutants and reduce stormwater runoff. Collected water is then used by the vegetation in evapotranspiration and infiltrated into the soil. Larger-volume systems may be designed to include stone or sand beds for storage underneath the soil to provide additional capacity. Properly designed bioretention practices mimic natural ecosystems through species diversity, density, and distribution of vegetation. The use of native species results in a system that is resistant to insects, disease, pollution, and climatic stresses. Often also referred to as bioinfiltration areas, biofilters, rain gardens, bioswales, and recharge gardens.

**Cisterns**: Large-scale rain barrels used in commercial and industrial settings (see also *Stormwater Harvesting and Reuse*).

**Constructed Wetlands**: Shallow marsh systems planted with emergent vegetation that are designed to treat stormwater runoff. They are extremely effective for pollutant removal. They can also mitigate peak runoff rates and reduce runoff volume. Constructed wetlands are often categorized in four groups: shallow wetlands, extended detention shallow wetlands, pocket wetlands, and pond/wetlands. Shallow wetlands are large and primarily accomplish water quality improvements. The extended detention shallow wetland is similar to the shallow wetlands but uses extended detention to accomplish both water quality and peak rate control. Pocket wetlands serve a smaller drainage area (usually between 5 and 10 acres). Pond/wetland systems are a combination of a wet pond and a constructed wetland. All of the constructed wetlands have considerable aesthetic and wildlife benefits and are a good option for retrofitting existing detention basins.

**Downspout Disconnection:** The removal of roof runoff from a direct connection to a combined or storm sewer system. Historically, many communities required that roofs direct stormwater conveyance to storm sewers to rapidly convey the water away from the structure. However, by redirecting the rain to a designated vegetated pervious area, runoff volume can be greatly reduced and water quality benefits can be achieved. When disconnecting a downspout, the runoff is directed to a vegetated and pervious area where plant and soil can filter and infiltrate the water.

**Floodplain Restoration:** Re-establishment of the natural water right-of-ways that provide temporary storage for large flood events, keeping people and structures out of harm's way and preserving riparian ecosystems and habitats. Over time, floodplains have been filled in and built on, thereby reducing nature's ability to cope with large rain events. Restoring these floodplains enables them to provide safe storage in large events, reduce volume through infiltration and evaporation, and filter sediment and nutrients from the water before it reaches or re-enters the larger waterbody. Floodplain restoration may include the rehabilitation of riparian buffers.

**Green Roofs:** Vegetation, growing media, and a drainage layer installed on top of a roof. Green roofs reduce stormwater runoff and attenuate peak flows through absorption and evapotranspiration by the vegetation; water evaporates off the plant and soil surface and, in larger storms, a portion runs off after being detained on the roof. There are two types of green roofs: extensive and intensive. Extensive green roofs are thinner, lighter, and less expensive and generally require low maintenance. Intensive green roofs often have pedestrian access and are characterized by a deeper soil layer with greater weight, higher capital cost, increased plant diversity, and more maintenance requirements.

**Green Walls:** Typically vertical systems that consist of a container to hold growing media and vegetation. Vegetation can be rooted in the ground, in modular containers, in growing blocks, or in growing mats located at various heights along the face of the structure. Green walls provide air quality and stormwater benefits, and can help to reduce energy usage.

**Permeable Pavement:** Designed to convey rainfall through the pavement surface into an underlying reservoir where it can infiltrate, thereby reducing stormwater runoff from a site. Given appropriate soil and subsurface conditions, permeable pavements can be used in any type of development (e.g., roads, parking lots, sidewalks, basketball/tennis courts, playgrounds, and plaza surfaces). Permeable pavement includes pervious asphalt and concrete and pervious pavers such as reinforced turf, interlocking modules, and pavers.

**Rain Barrels:** Storage tanks that collect rain from rooftops, typically utilized in residential settings (see also *Stormwater Harvesting and Reuse*).

**Riparian Buffers**: Vegetated or undisturbed natural areas that help to protect a waterbody from pollutants by absorbing or infiltrating runoff before it enters the waterbody. These riparian zones reduce sediment, nitrogen, phosphorous, pesticides, and other pollutants by intercepting them and soaking the water and associated pollutants into the ground. Healthy riparian buffers provide habitat, stabilize channels and banks, improve water quality, provide stream shade and temperature control, and improve aesthetics.

**Stormwater Harvesting and Reuse:** Use of rain barrels and cisterns to store stormwater runoff for lawn/landscaping irrigation, or the water can be filtered and used for non-potable activities such as car washing or filling swimming pools. Rain barrels and cisterns may be constructed of any water-retaining material; their size varies from hundreds of gallons for residential uses to tens of thousands of gallons for commercial and/or industrial uses. The storage systems may be located either above or below ground and may be constructed of on-site material or pre-manufactured.

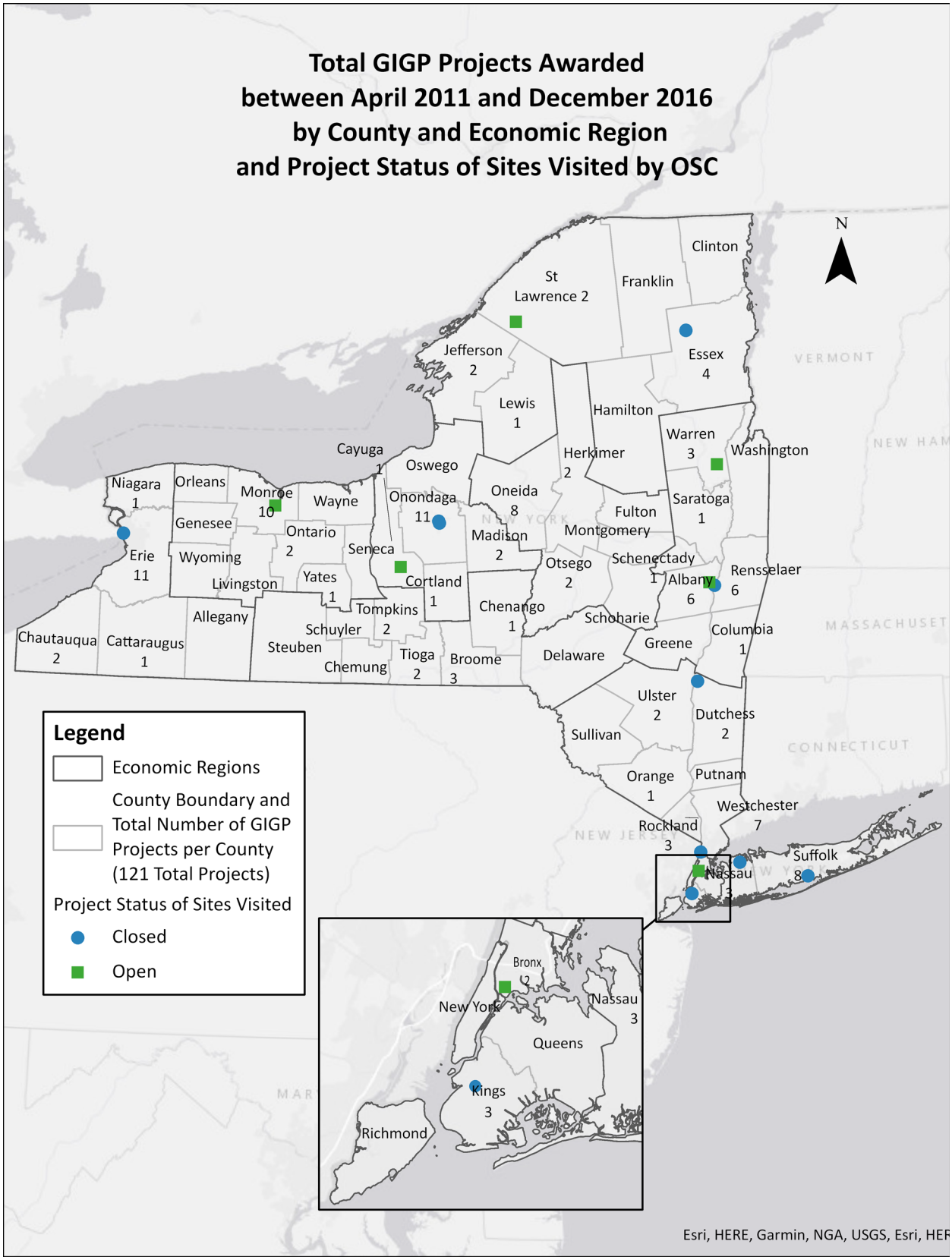
**Stormwater Planters:** A type of bioretention in which specialized planters are designed to manage stormwater through filtration, infiltration, and evapotranspiration. There are three main types of stormwater planters: container planters, infiltration planters, and flow-through planters. All three types of planters include three common elements: planter “box” material, growing media, and vegetation.

**Stormwater Street Trees**: Engineered tree pits, tree boxes, and trenches designed to capture stormwater from the adjacent roadway and manage the stormwater through evapotranspiration and infiltration. They provide for water quality in addition to numerous other benefits, including: reducing energy usage by shading buildings in the summer to reduce thermal loads and blocking winter winds, providing wildlife habitat, sequestering carbon dioxide and other greenhouse gases, intercepting and absorbing pollutants through their leaves and branches, increasing property values and revenues, improving walkability of communities, traffic calming, engaging residents in creating safer neighborhoods, and promoting smart growth.

**Stream Daylighting:** The unearthing of natural streams from artificial pipes and culverts to restore a natural stream morphology capable of accommodating a range of hydrologic conditions while also providing biological integrity. Stream daylighting restores habitat, promotes infiltration, helps reduce pollutant loads, and can provide better runoff attenuation because it increases the storage size of the natural system. The historic enclosure of rivers and streams often took place in urbanized areas to accommodate development. Stream daylighting re-establishes stream banks where culverts once existed. This often requires updating of existing gray stormwater infrastructure. When the operation is complete, what was once a linear pipe of heavily polluted water can become a meandering stream with dramatic improvements to both aesthetics and water quality. Stream daylighting is not only an important water quality practice, but also a powerful economic development and community revitalization tool.

**Urban Forestry Programs**: A detailed inventory and map of existing and proposed trees, usually including detailed data on each tree with respect to species, site, condition, and management needs. This baseline data helps to ensure the success of the program by determining the location and species for planting and managing an effective maintenance program to ensure tree health. This enables a community to best manage and maintain its urban forest.

# Exhibit B


Total GIGP Projects Awarded
between April 2011 and December 2016
by County and Economic Region
and Project Status of Sites Visited by OSC
N
Clinton
Franklin
St Lawrence 2
Essex 4
Jefferson 2
Lewis 1
Hamilton
Warren 3
Washington
Herkimer 2
Cayuga 1
Oswego
Niagara 1
Orleans
Monroe 10
Wayne
Onondaga 11
Oneida 8
Saratoga 1
Fulton
Montgomery
Genesee
Ontario 2
Madison 2
Erie 11
Wyoming
Seneca
Otsego 2
Schenectady 1
Rensselaer 6
Albany 6
Livingston
Yates 1
Cortland 1
Tompkins 2
Chenango 1
Schoharie
Allegany
Columbia 1
Chautauqua 2
Cattaraugus 1
Schuyler
Steuben
Chemung
Tioga 2
Broome 3
Delaware
Greene
Ulster 2
Dutchess 2
Sullivan
Orange 1
Putnam
Westchester 7
Rockland 3
Suffolk 8
Nassau 3
Legend
Economic Regions
County Boundary and Total Number of GIGP Projects per County (121 Total Projects)
Project Status of Sites Visited
Closed
Open
Bronx 2
New York
Nassau 3
Queens
Kings 3
Richmond
VERMONT
NEW HAM
MASSACHUSET
CONNECTICUT
Esri, HERE, Garmin, NGA, USGS, Esri, HER

# Exhibit C

## Project Descriptions for Sites Visited

| Grantee | Project Description |
|---|---|
| Albany Water Board | The Board will incorporate a retrofit into the project to help reduce combined sewer outflows into the Hudson River. Funds will support a constructed wetland to manage stormwater from Ryckman Alley. |
| Bard College | The project will slow the speed of stormwater, clean it, and infiltrate it as part of a solution to the problem of flooding and water contamination caused by impermeable surfaces. |
| BNSC | BNSC will implement green infrastructure practices throughout a 25-block area to include rain gardens, bioretentions, downspout disconnections, permeable pavers, living walls, green roofs, and a rain barrel program. |
| Cayuga County | The county will restore a portion of the Owasco Flats degraded wetland as a fully functioning wetland, creating wildlife habitat, improving water quality, and helping ensure it remains a safe source of drinking water for area residents. |
| City of Rensselaer | The project components will help expand the scope of the Washington Avenue and Columbia Turnpike road. The project will include permeable pavement, stormwater tree pits, and stormwater practices to reduce runoff and improve water quality. |
| City of Yonkers | The City will unearth (daylight) a segment of the Saw Mill River, improving water quality, providing habitat, leveraging private investment, and transforming the Mill Street Courtyard into a major public space in downtown Yonkers. |
| NYC Parks-Bronx | The Department will construct five green streets in Bronx County. Additional green measures will be implemented at the St. Anne's Recreation Center in the area, including a green roof, a rain garden/bioretention area, as well as a downspout disconnect. |
| NYC Parks-Brooklyn | The project components will help toward the installation of over 35,000 square feet of green roofs on a recreation facility. The project will significantly reduce the rate and volume of storm runoff and pollutant loads that would have otherwise been discharged from the roofs into the combined sewer system of New York City, which ultimately discharges into New York Harbor. |
| NYS Office of Parks and Recreation and Historic Preservation | The project components will support the redevelopment of the main parking area at Planting Fields Arboretum and State Historic Site using green infrastructure. The parking area will improve the connectivity of the park, showcasing bioretention, pervious pavements, and constructed wetlands as well as a series of biofilters. |
| Onondaga County | Onondaga County will retrofit East Washington Street, constructing bioretention areas and installing stormwater tree pits adjacent to the Syracuse Center of Excellence headquarters at Syracuse University. |
| Syracuse University | The University will implement a rainwater harvesting and reuse project at the Carrier Dome event space. Rainwater will be collected from the roof and used to service the public restrooms at the facility, in addition to reducing the amount of municipal water used at the site. |

| | |
|---|---|
| Town of Brighton | The Town will retrofit Monroe Avenue with green infrastructure stormwater management practices, and an adjacent channelized stream segment will be naturalized. Plans involve bioretention, porous sidewalks, and stormwater street trees, and will include riparian buffers that are constructed to reduce stormwater pollution and protect water quality. |
| Town of Brookhaven | The Town will transform a blighted commercial property on its main thoroughfare into a public park. The project will restore the natural shoreline of the nearby Swan River, and add bioretention, pervious pavement, and a rain garden to intercept and treat stormwater from a parking lot. |
| Town of Lake George | The project will combine Complete Streets design principles with green infrastructure practices such as porous pavement, bioretention, and stormwater street trees to improve water quality and pedestrian safety in this “Gateway” into the Town. |
| Village of Gouverneur | This is part of an existing project to eliminate combined sewer overflows into the Oswegatchie River. Green infrastructure practices, including bioretention/bioinfiltration, rain gardens, constructed wetlands, rain barrels, and porous pavement, will all be incorporated into a larger sewer separation project. |
| Village of Lake Placid | The Village will restore wildlife habitat and improve and protect water quality, in conjunction with the replacement of an aged trunk sewer system, by removing an existing dam that will restore approximately 1,200 linear feet of natural streambed and riparian buffers as well as include an acre of additional wetland. |

# Agency Comments


Environmental Facilities Corporation

ANDREW M. CUOMO
Governor
SABRINA M. TY
President and CEO

May 7, 2018

Stephen Goss, CIA, CGFM
Audit Director
Office of the State Comptroller
Division of State Government Accountability
110 State Street, 11th Floor
Albany, New York 12236-0001

RE: Green Innovation Grant Program (GIGP) Audit 2017-S-19
Response to Draft Report Findings and Recommendations

Dear Mr. Goss:

Thank you for the opportunity to provide a written response to the draft report entitled *Monitoring the Green Innovation Grant Program.*

The Environmental Facilities Corporation (EFC) is encouraged by the results of the audit of the GIGP. The audit demonstrates that EFC's fiscal monitoring of the GIGP is strong and robust. In addition, it confirms the GIGP's scoring methodology is well-reasoned and the awarding of grants is a fair process.

Further, EFC has already taken action to address the draft report's recommendations, as discussed below:

Draft Report Recommendation #1 – Implement steps to increase the completion of site visits during the 50 to 75 percent completion window.

Although EFC has internal guidance that suggests site visits should generally occur between 50 to 75 percent completion, the proper timing for a site visit should always be determined on a case-by-case basis. For example, most porous pavement projects are completed in one day. This makes coordinating a site visit based on project completion percentages impracticable. For a larger project, EFC may visit the project site multiple times as there could be multiple gating items that are more important than items occurring during the 50 to 75 percent completion window.

* Comment 1

Aside from physical site visits, EFC has other cost-effective methods to ensure that projects are progressing and being constructed in accordance with approved plans and specifications. For instance, as documented in the draft report, EFC obtains numerous photographs per project showing key aspects of each project and documenting progress to completion. Many of these photographs fall within the 50 to 75 percent completion timeframe. Accordingly, EFC believes it has adequate procedures in place to monitor projects throughout construction.

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* See State Comptroller's Comment, Page 25.

Draft Report Recommendation #2 – Develop and implement a plan for post-construction monitoring.

EFC was pleased that the audit found no instances of critical maintenance issues at any of the sampled project sites. This demonstrates that EFC's current monitoring practices are performing at a reasonable level. EFC agrees, however, that there is always room for improvement.

To that end, and as a result of this audit, EFC undertook corrective action to increase its monitoring of certain key aspects of grantee compliance. For example, EFC no longer releases retainage to grantees until they provide proof that proper signage has been installed at the project site.

With respect to additional post-construction monitoring or site visits, EFC notes that monitoring is not a Clean Water State Revolving Fund or federal Green Project Reserve requirement and is only cost-effective when meaningful results can be obtained. EFC is currently evaluating its post-construction monitoring procedures and will take the recommendations of the draft report into consideration.

Draft Report Recommendation #3 – Remind grantees of their responsibility to maintain their projects.

EFC's GIGP team regularly communicates post-construction requirements to grantees. For instance, the GIGP grant application itself clearly lists all GIGP requirements and explicitly references long-term maintenance. The Grant Agreement signed by every grantee requires, amongst other things, that grantees maintain the project after construction. Moreover, all retainage release letters remind grantees about the continued maintenance obligations of the GIGP grant.

Although EFC undertakes significant outreach efforts, it believes further education on how to properly maintain projects would be worthwhile. EFC has added a new section to the standard GIGP Feasibility Study dedicated to operation and maintenance. This new section will require grantees to provide a detailed maintenance plan for the project. In addition, as a result of this audit, the GIGP team's grantee webinar will now include a section regarding the importance of properly maintaining green infrastructure practices, including GIGP project maintenance requirements.

Should you have any questions, please contact me at (518) 402-6924.

Sincerely,

Brian Hahn
Manager
Green Policy, Planning and Infrastructure

cc: Basil Seggos
Kenneth Lynch
Sabrina M. Ty
Michael Malinoski

# State Comptroller's Comment

1. The Corporation states that the timing of site visits should be determined on a case-by-case basis, and basing some visits on the percentage of completion can be impracticable, such as when a project is completed in a very short time span. While this can be true in some cases, seven of ten completed projects we selected were not visited until after the 90 percent completion point. We question the rationale for such late visits for all seven, especially considering that one project took over two years to construct and two took over a year.