

AN OVERVIEW OF THE PHILADELPHIA WATER DEPARTMENT'S GREEN STORMWATER OPERATIONS UNIT (GSO)

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Highlights

- PWD's Green Stormwater Operations (GSO) Unit currently manages approximately 1,300 existing stormwater management practices (SMPS)
- GSO has combined a robust work order management platform and comprehensive series of standard operating procedures to streamline the management of PWD's GSI portfolio.
- GSO's Grounds Maintenance Team is one of the only municipal operations teams that focuses entirely on GSI

Introduction

The Philadelphia Water Department's (PWD) Green Stormwater Operations Unit (GSO) oversees the inspection, operation and maintenance of PWD's green stormwater infrastructure (GSI) assets. Inspection and maintenance tasks are divided amongst both field operations crews and contractors – typically on a geographic basis of GSO's Grounds Maintenance Team.

Background

GSO's Core Operations

GSO's core operations regime is divided into six key components which are the maintenance of surface features, maintenance of subsurface features, maintenance of permeable pavement, retrofits and repairs, assets protection and routine inspections in both wet and dry weather. In fiscal year 2021, a total of 20,600 work orders were completed in order to fulfill the scope of GSI inspection, maintenance and repair.

Scope of Services

At the start of fiscal year 2021 GSO maintained a total of 1,012 SMPs which collectively consisted of a total of 922 green inlets, over 178,000 linear feet (LF) of stormwater piping and 431,850 ft² (~10 acres) of vegetated area. GSO distributes inspection and maintenance tasks over 7 management districts that span both the combined sewer and separate sewersheds. An overview of GSO's maintenance protocols, challenges encountered in field and lessons learned will be presented along with the development.

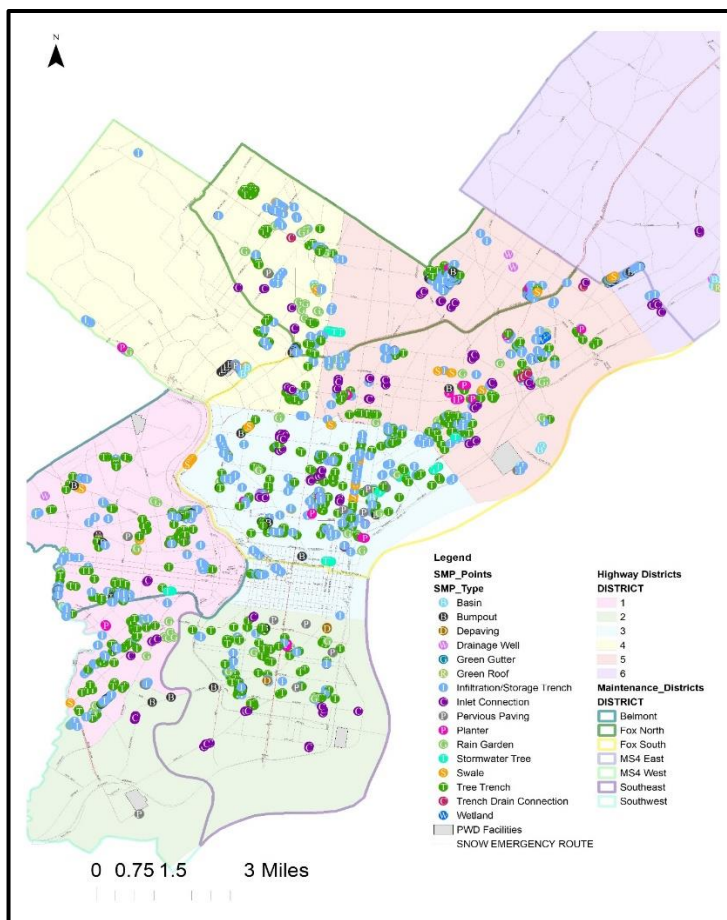


Figure 1: 2021 SMP Distribution by Maintenance District

Key Findings

GSO's Grounds Maintenance Team has evolved into a fully functional field operations arm of the Unit. Through long-term planning efforts, comprehensive training and a focus on growth, - GSO's Ground Maintenance Team has been able to continually expand its capacity, level of expertise and scope of services.

At present the GSO Grounds Maintenance Team maintains approximately 50% of PWD's GSI assets that have vegetated surface expressions (i.e. rain gardens, stormwater tree trenches, stormwater planters, etc.). As PWD's implementation of GSI continues over the next 15 years, it is anticipated that continued expansion of capacity and scope of services will continue in order to facilitate cost-effective management of the Department's GSI asset portfolio.

Recommendations

In order to develop a scalable inspection and maintenance regime for efficient and cost-effective of GSI assets, municipalities should ensure to continually build capacity. Capacity building should include aspects of staffing, training, equipment, maintenance or storage facilities and bulk materials supply. In addition, continual review and modification of standard operating procedures for administrative and field operations tasks should be incorporated into the development of municipal operations units.



Expecting the Unexpected; Anticipation, Preparation, Response, and Oversight of Green Stormwater Infrastructure in an Urban Environment

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Highlights

- Overview of controllable and non-controllable issues that can cause issues with Green Stormwater Infrastructure.
- Reactions to Unexpected issues and processes to reduce the impact of unexpected issues.
- Best practices for getting ahead of controllable issues.

Introduction

Siting GSI in an urban environment requires careful consideration of a myriad of external factors during the design, construction, and maintenance phases of implementation. Some of these factors can be easily controlled through establishment of internal processes and procedures while others are beyond most levels of control given the inability to predict their occurrence and severity of associated impacts.

Background

The Philadelphia Water Department's (PWD) Green City, Clean Waters, a 25-year plan to manage stormwater runoff with innovative green stormwater infrastructure (GSI), requires an effective operations and maintenance program to ensure long-term sustainability and functionality of GSI systems as well as public safety. Nearly 1200 individual Stormwater Management Practices (SMPs) are currently maintained by PWD's Green Stormwater Operations (GSO) unit. It is expected that an additional 150-200 SMPs to be added to the inspections and maintenance queue each year.

Key Findings

Through the use of established processes and procedures along with strong partnerships with internal utility units as well as outside municipal agencies, fellow utilities, and the development community at large, it is possible to mitigate and reduce controllable issues and better react to unforeseen/uncontrollable issues.



Figure 1: A Multi-Alarm Fire adjacent to Green Stormwater Infrastructure Site (Foreseeable but Uncontrollable Issue)

Recommendations

Have mechanisms in place for reaction to issues, both controllable and non-controllable.

Build relationships with internal and external partners to have a single point of contact for issues to reduce reaction times.

Continue to educate the public as well as internal and external partners about GSI.