RUTGERS
New Jersey Agricultural
Experiment Station

Draft

Impervious Cover Reduction Action Plan
for
Piscataway Township, Middlesex County, New Jersey

Prepared for Piscataway Township by the
Rutgers Cooperative Extension Water Resources Program

September 30, 2015

Table of Contents

Attachment: Climate Resilient Green Infrastructure

a. Overview Map of the Project

b. Green Infrastructure Sites

c. Proposed Green Infrastructure Concepts

d. Summary of Existing Conditions

e. Summary of Proposed Green Infrastructure Practices

Introduction

Located in Middlesex County in central New Jersey, Piscataway Township covers approximately 19.0 square miles. Figures 1 and 2 illustrate that Piscataway Township is dominated by urban land uses. A total of 72.5% of the municipality's land use is classified as urban. Of the urban land in Piscataway Township, medium density residential is the dominant land use (Figure 3).

The New Jersey Department of Environmental Protection's (NJDEP) 2007 land use/land cover geographical information system (GIS) data layer categorizes Piscataway Township into many unique land use areas, assigning a percent impervious cover for each delineated area. These impervious cover values were used to estimate the impervious coverage for Piscataway Township. Based upon the 2007 NJDEP land use/land cover data, approximately 30.2% of Piscataway Township has impervious cover. This level of impervious cover suggests that the streams in Piscataway Township are likely non-supporting streams. [1]

Methodology

Piscataway Township contains portions of four subwatersheds (Figure 4). For this impervious cover reduction action plan, projects have been identified in each of these watersheds. Initially, aerial imagery was used to identify potential project sites that contain extensive impervious cover. Field visits were then conducted at each of these potential project sites to determine if a viable option exists to reduce impervious cover or to disconnect impervious surfaces from draining directly to the local waterway or storm sewer system. During the site visit, appropriate green infrastructure practices for the site were determined. Sites that already had stormwater management practices in place were not considered.

[1] Caraco, D., R. Claytor, P. Hinkle, H. Kwon, T. Schueler, C. Swann, S. Vysotsky, and J. Zielinski. 1998. Rapid Watershed Planning Handbook. A Comprehensive Guide for Managing Urbanizing Watersheds. Prepared by Center For Watershed Protection, Ellicott City, MD. Prepared for U.S. Environmental Protection Agency, Office of Wetlands, Oceans and Watersheds and Region V. October 1998

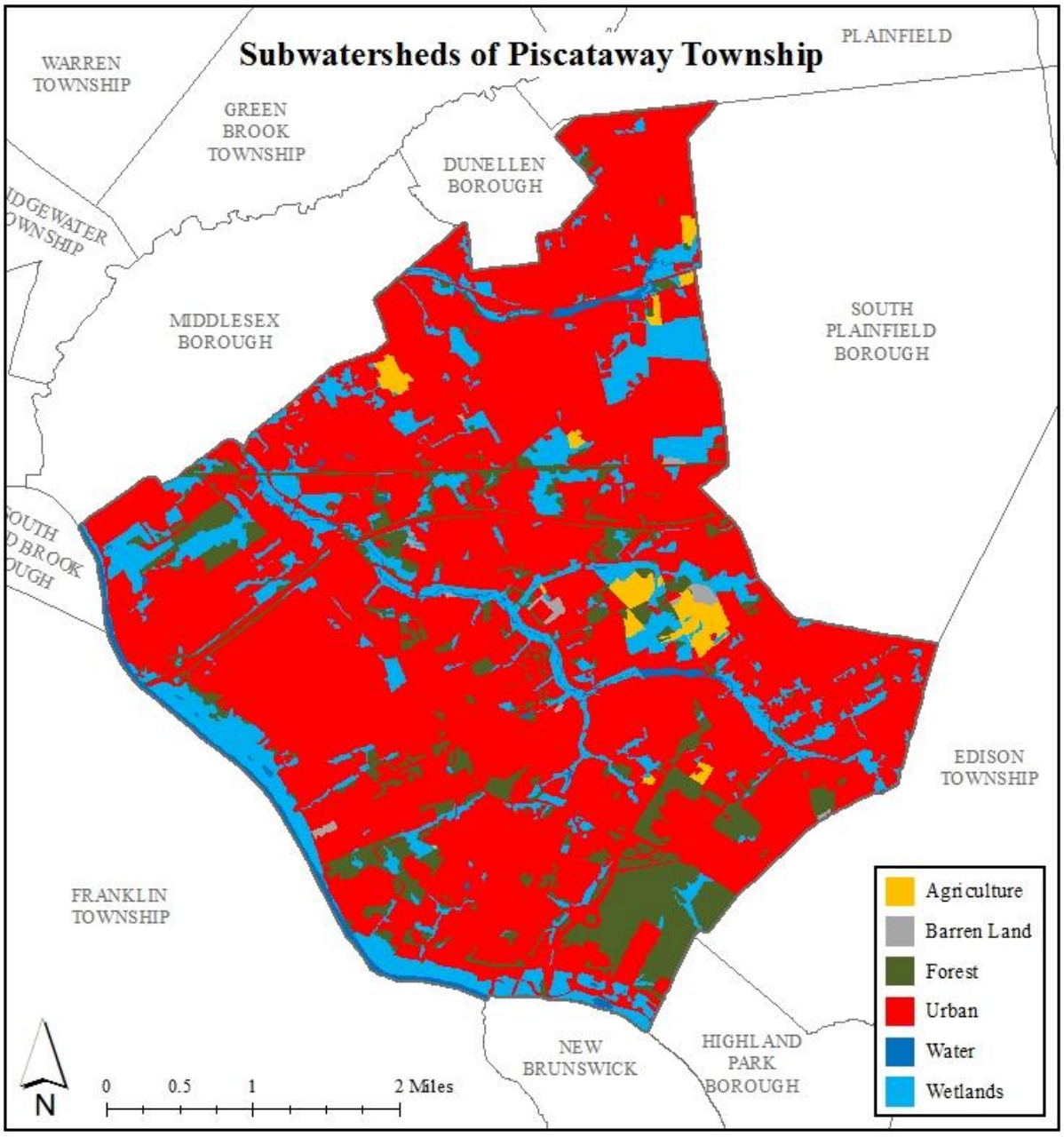


Figure 1: Map illustrating the land use in Piscataway Township

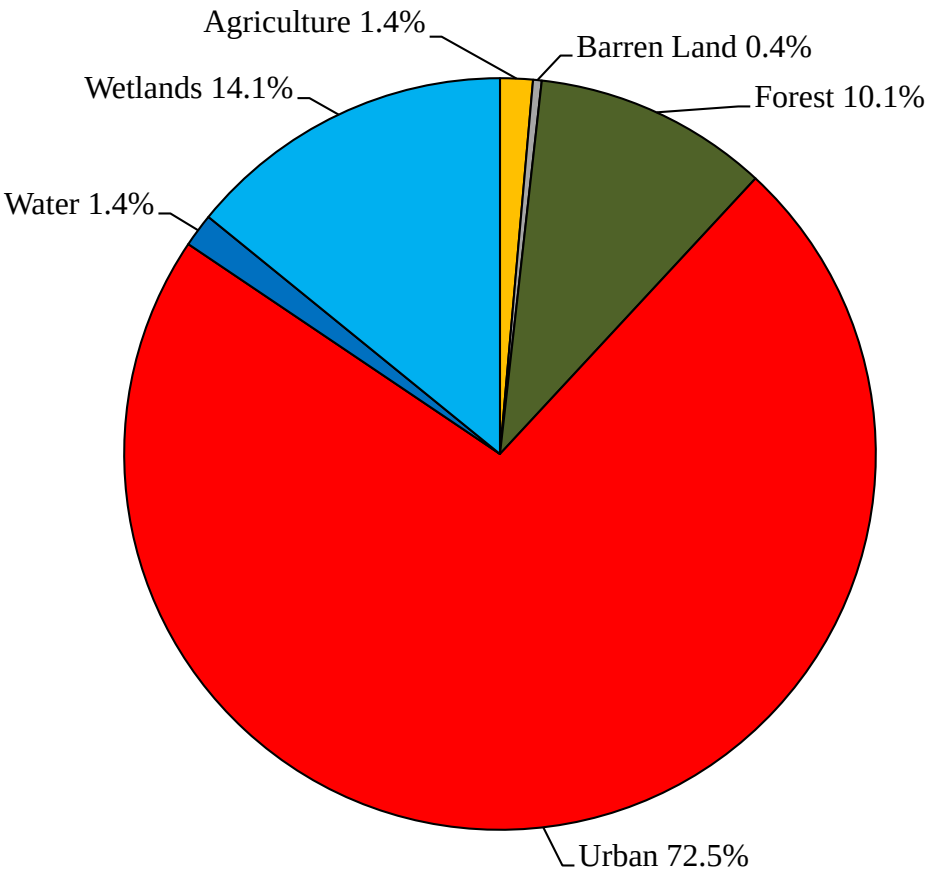


Figure 2: Pie chart illustrating the land use in Piscataway Township

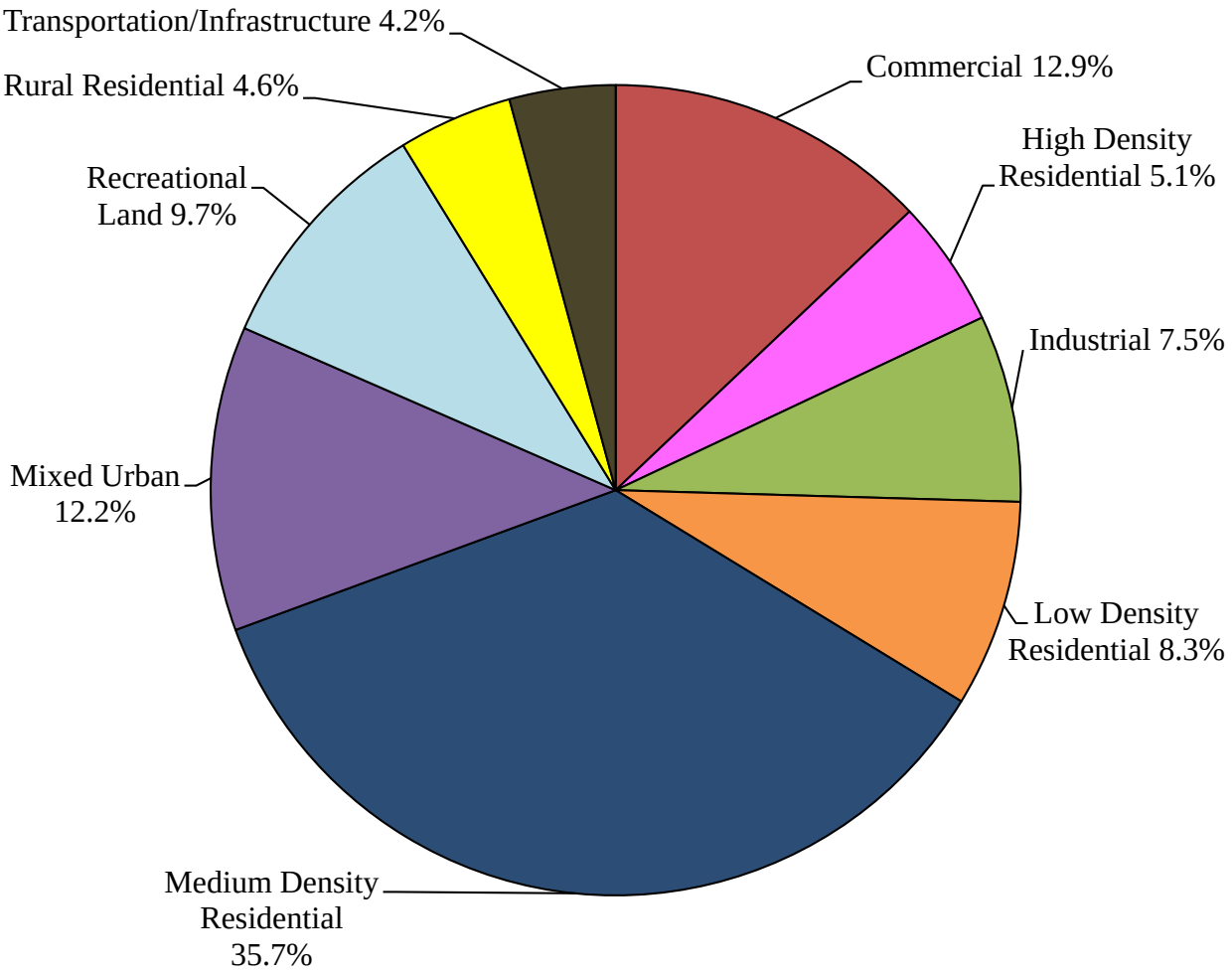


Figure 3: Pie chart illustrating the various types of urban land use in Piscataway Township

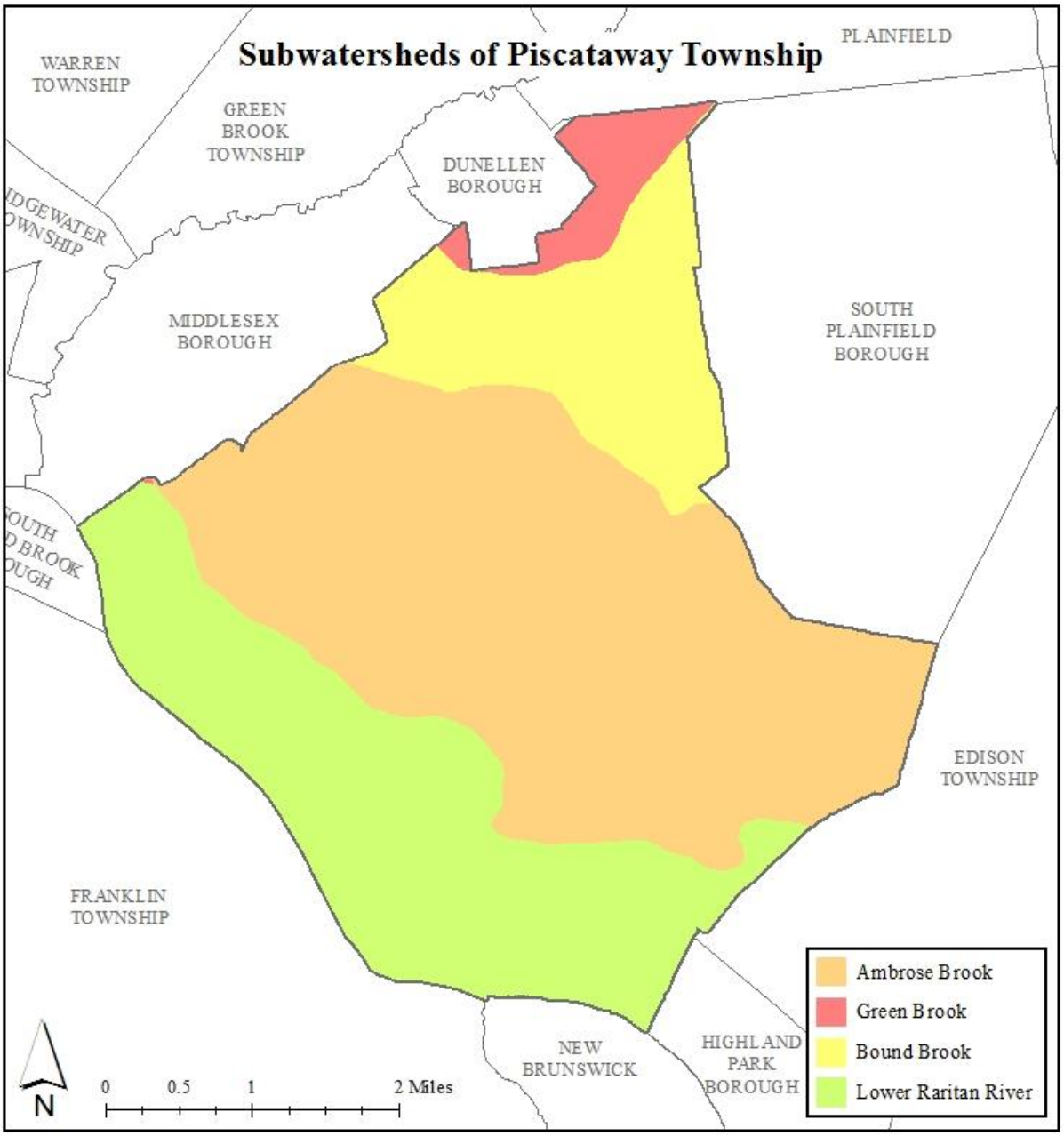


Figure 4: Map of the subwatersheds in Piscataway Township

For each potential project site, specific aerial loading coefficients for commercial land use were used to determine the annual runoff loads for total phosphorus (TP), total nitrogen (TN), and total suspended solids (TSS) from impervious surfaces (Table 1). These are the same aerial loading coefficients that NJDEP uses in developing total maximum daily loads (TMDLs) for impaired waterways of the state. The percentage of impervious cover for each site was extracted from the 2007 NJDEP land use/land cover database. For impervious areas, runoff volumes were determined for the water quality design storm (1.25 inches of rain over two-hours) and for the annual rainfall total of 44 inches.

Preliminary soil assessments were conducted for each potential project site identified in Piscataway Township using the United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey, which utilizes regional and statewide soil data to predict soil types in an area. Several key soil parameters were examined (e.g., natural drainage class, saturated hydraulic conductivity of the most limiting soil layer (K_{sat}), depth to water table, and hydrologic soil group) to evaluate the suitability of each site's soil for green infrastructure practices. In cases where multiple soil types were encountered, the key soil parameters were examined for each soil type expected at a site.

For each potential project site, drainage areas were determined for each of the green infrastructure practices proposed at the site. These green infrastructure practices were designed to manage the 2-year design storm, enabling these practices to capture 95% of the annual rainfall. Runoff volumes were calculated for each proposed green infrastructure practice. The reduction in TSS loading was calculated for each drainage area for each proposed green infrastructure practice using the aerial loading coefficients in Table 1. The maximum volume reduction in stormwater runoff for each green infrastructure practice for a storm was determined by calculating the volume of runoff captured from the 2-year design storm. For each green infrastructure practice, peak discharge reduction potential was determined through hydrologic modeling in HydroCAD. For each green infrastructure practice, a cost estimate is provided. These costs are based upon the square footage of the green infrastructure practice and the real cost of green infrastructure practice implementation in New Jersey.

Table 1: Aerial Loading Coefficients[2]

Land Cover	TP load (lbs/acre/yr)	TN load (lbs/acre/yr)	TSS load (lbs/acre/yr)
High, Medium Density Residential	1.4	15	140
Low Density, Rural Residential	0.6	5	100
Commercial	2.1	22	200
Industrial	1.5	16	200
Urban, Mixed Urban, Other Urban	1.0	10	120
Agriculture	1.3	10	300
Forest, Water, Wetlands	0.1	3	40
Barrenland/Transitional Area	0.5	5	60

[2] New Jersey Department of Environmental Protection (NJDEP), Stormwater Best Management Practice Manual, 2004.

Green Infrastructure Practices

Green infrastructure is an approach to stormwater management that is cost-effective, sustainable, and environmentally friendly. Green infrastructure projects capture, filter, absorb, and reuse stormwater to maintain or mimic natural systems and to treat runoff as a resource. As a general principal, green infrastructure practices use soil and vegetation to recycle stormwater runoff through infiltration and evapotranspiration. When used as components of a stormwater management system, green infrastructure practices such as bioretention, green roofs, porous pavement, rain gardens, and vegetated swales can produce a variety of environmental benefits. In addition to effectively retaining and infiltrating rainfall, these practices can simultaneously help filter air pollutants, reduce energy demands, mitigate urban heat islands, and sequester carbon while also providing communities with aesthetic and natural resource benefits[3]. A wide range of green infrastructure practices have been evaluated for the potential project sites in Piscataway Township. Each practice is discussed below.

Disconnected downspouts

This is often referred to as simple disconnection. A downspout is simply disconnected, prevented from draining directly to the roadway or storm sewer system, and directed to discharge water to a pervious area (i.e., lawn).

Pervious pavements

There are several types of permeable pavement systems including porous asphalt, pervious concrete, permeable pavers, and grass pavers. These surfaces are hard and support vehicle traffic but also allow water to infiltrate through the surface. They have an underlying stone layer to store stormwater runoff and allow it to slowly seep into the ground.




[3] United States Environmental Protection Agency (USEPA), 2013. Watershed Assessment, Tracking, and Environmental Results, New Jersey Water Quality Assessment Report. http://ofmpub.epa.gov/waters10/attains_state.control?p_state=NJ

Bioretention systems/rain gardens

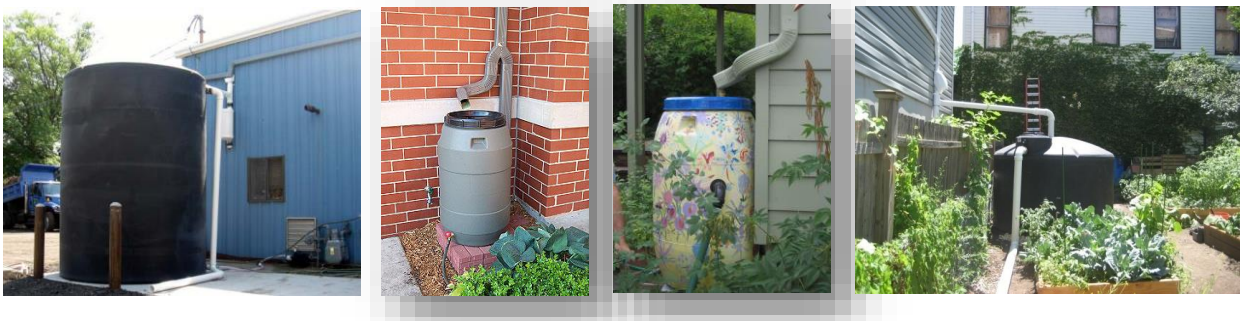
These are landscaped features that are designed to capture, treat, and infiltrate stormwater runoff. These systems can easily be incorporated into existing landscapes, improving aesthetics and creating a wildlife habitat while managing stormwater runoff. Bioretention systems also can be used in soils that do not quickly infiltrate by incorporating an underdrain into the system.

Downspout planter boxes

These are wooden boxes with plants installed at the base of a downspout that provide an opportunity to beneficially reuse rooftop runoff.

Rainwater harvesting systems (cistern or rain barrel)

These systems capture rainwater, mainly from rooftops, in cisterns or rain barrels. The water can then be used for watering gardens, washing vehicles, or for other non-potable uses.



Bioswale

Bioswales are landscape features that convey stormwater from one location to another while removing pollutants and providing water an opportunity to infiltrate.

Stormwater planters

Stormwater planters are vegetated structures that are built into the sidewalk to intercept stormwater runoff from the roadway or sidewalk. Many of these planters are designed to allow the water to infiltrate into the ground while others are designed simply to filter the water and convey it back into the stormwater sewer system.

Tree filter boxes

These are pre-manufactured concrete boxes that contain a special soil mix and are planted with a tree or shrub. They filter stormwater runoff but provide little storage capacity. They are typically designed to quickly filter stormwater and then discharge it to the local sewer system.

Potential Project Sites

Attachment 1 contains information on potential project sites where green infrastructure practices could be installed. The recommended green infrastructure practice and the drainage area that the green infrastructure practice can treat are identified for each potential project site. For each practice, the recharge potential, TSS removal potential, maximum volume reduction potential per storm, and the peak reduction potential are provided. This information is also provided so that proposed development projects that cannot satisfy the New Jersey stormwater management requirements for major development can use one of the identified projects to offset a stormwater management deficit. [4]

[4] New Jersey Administrative Code, N.J.A.C. 7:8, Stormwater Management, Statutory Authority: N.J.S.A. 12:5-3, 13:1D-1 et seq., 13:9A-1 et seq., 13:19-1 et seq., 40:55D-93 to 99, 58:4-1 et seq., 58:10A-1 et seq., 58:11A-1 et seq. and 58:16A-50 et seq., *Date last amended: April 19, 2010*.

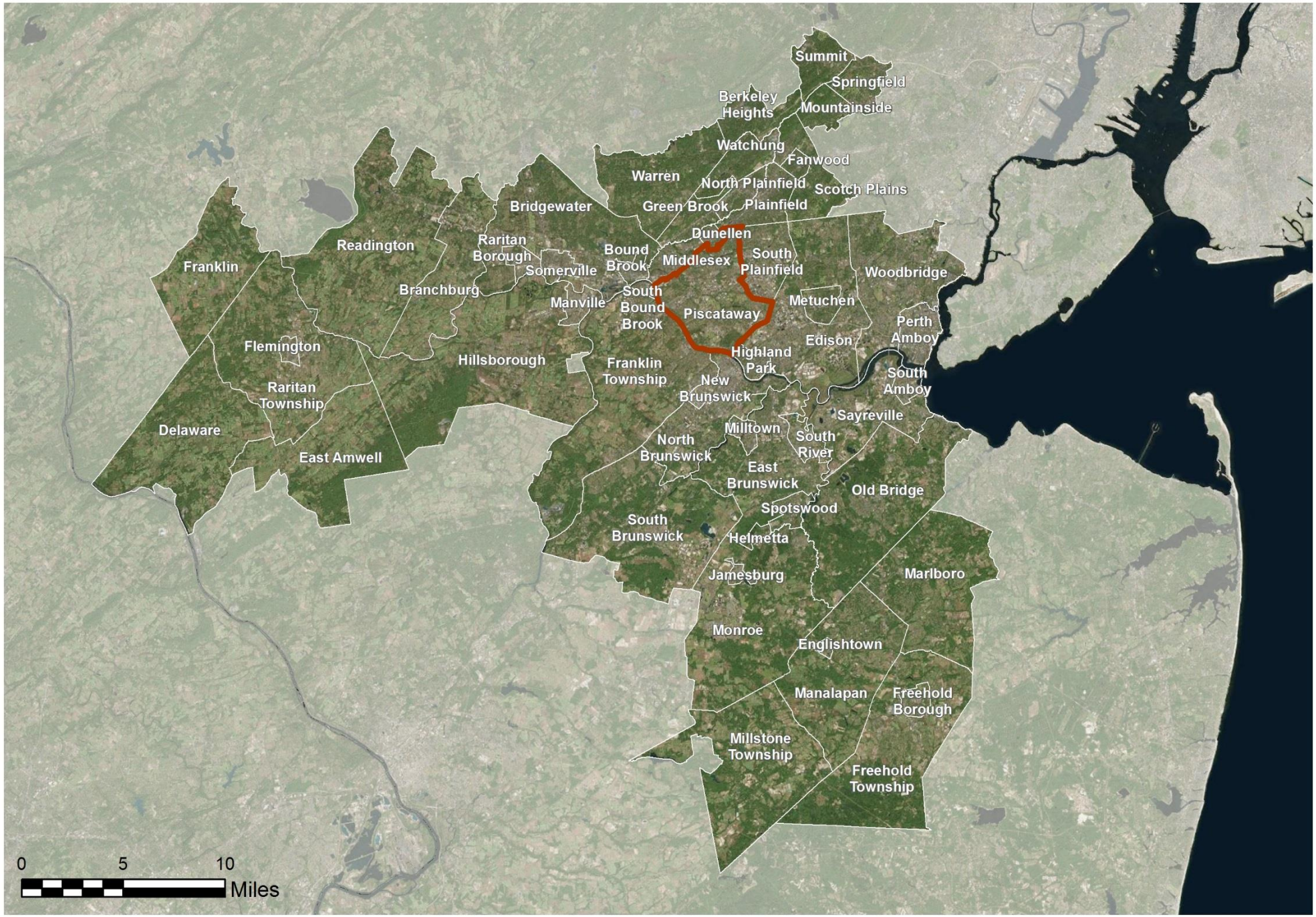
Conclusion

This impervious cover reduction action plan is meant to provide the municipality with a blueprint for implementing green infrastructure practices that will reduce the impact of stormwater runoff from impervious surfaces. These projects can be implemented by a wide variety of people such as boy scouts, girl scouts, school groups, faith-based groups, social groups, watershed groups, and other community groups.

Additionally, development projects that are in need of providing off-site compensation for stormwater impacts can use the projects in this plan as a starting point. The municipality can quickly convert this impervious cover reduction action plan into a stormwater mitigation plan and incorporate it into the municipal stormwater control ordinance.

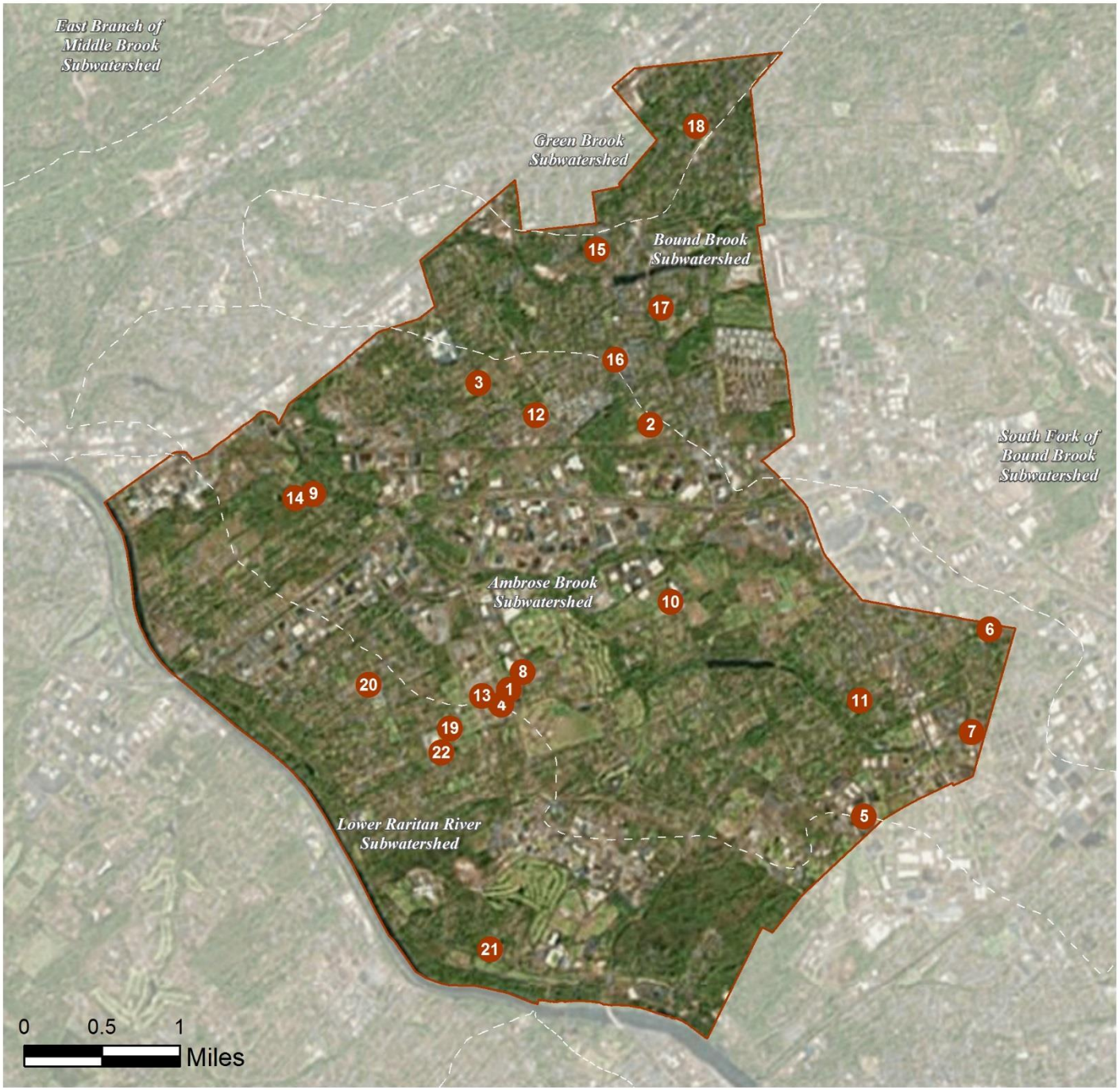
a. Overview Map of the Project

PISCATAWAY: CLIMATE RESILIENT GREEN INFRASTRUCTURE FOR THE RARITAN BASIN



b. Green Infrastructure Sites

PISCATAWAY: GREEN INFRASTRUCTURE SITES



SITES WITHIN THE AMBROSE BROOK SUBWATERSHED:

1. Christ United Methodist Church
2. Eisenhower Elementary School
3. Grandview Elementary School
4. John F. Kennedy Library
5. Middlesex County Vocation and Technical High School
6. New Dunham Chapel
7. Piscataway Board of Operations Complex
8. Piscataway Municipal Center
9. Possumtown Volunteer Fire Company
10. Randolphville School
11. Travelers Fellowship Church
12. T. Schnor Middle School
13. US Post Office
14. Wynnewood Swim Club

SITES WITHIN THE BOUND BROOK SUBWATERSHED:

15. First Baptist Church of New Market
16. Piscataway Public Library
17. Quibbletown Middle School

SITES WITHIN THE GREEN BROOK SUBWATERSHED:

18. Arbor Intermediate School

SITES WITHIN THE LOWER RARITAN RIVER SUBWATERSHED:

19. Conackawack Middle School
20. Knollwood Elementary School
21. St George Church
22. Zion Hill Baptist Church

c. Proposed Green Infrastructure Concepts

CHRIST UNITED METHODIST CHURCH

Subwatershed: **Ambrose Brook**

Site Area: **205,215 sq. ft.**

Address: **485 Hoes Lane**
Piscataway, NJ 08854

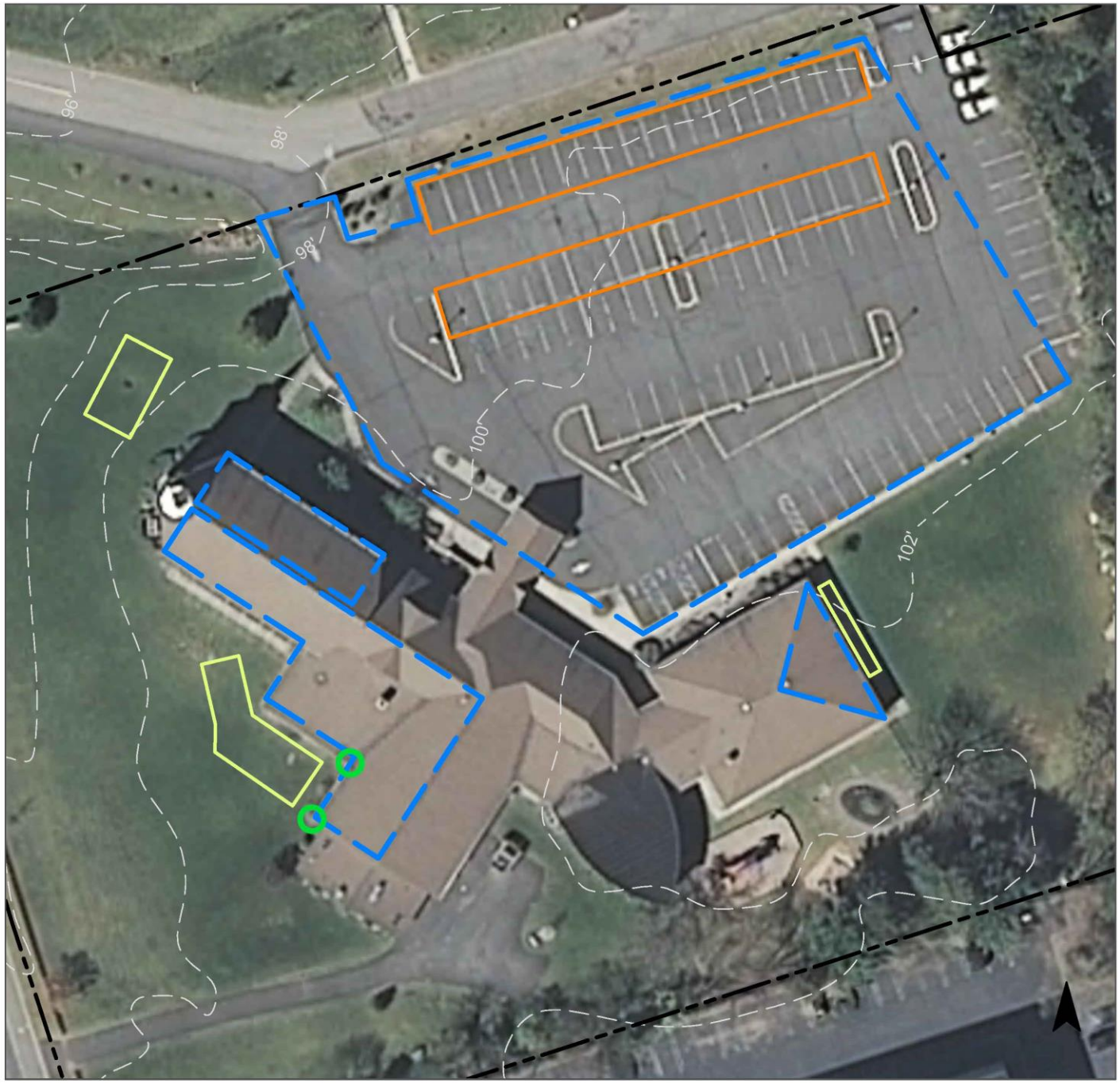
Block and Lot: **Block 7501, Lot 25**

Parking spaces can be converted into pervious pavement to capture and infiltrate runoff. Rain gardens can be installed to capture, treat, and infiltrate stormwater. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
50	102,505	4.9	51.8	470.6	0.080	2.81

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.209	35	15,371	0.58	2,060	$10,300
Pervious pavements	1.113	186	81,644	3.07	7,230	$180,750

GREEN INFRASTRUCTURE RECOMMENDATIONS



Christ United Methodist Church

- disconnected downspouts
- pervious pavement
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 30' 60'

EISENHOWER ELEMENTARY SCHOOL

Subwatershed: Ambrose Brook

Site Area: 522,418 sq. ft.

Address: 360 Stelton Road
Piscataway, NJ, 08854

Block and Lot: Block 2,101, Lot 5

A bioswale can be installed along the northwest wall of the school to manage runoff from the parking lot and roof. Pavement in the back of the school can be made into pervious pavement or de-paved in order to reduce the amount of impervious cover. A rain garden can also be installed in the courtyard to manage roof runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
45	235,714	11.4	119	1,082.2	0.184	6.46

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.253	42	18,588	0.70	2,365	$11,825
Bioswales	0.194	33	14,287	0.54	4,630	$23,150
Pervious pavements	1.811	303	132,807	5.0	19,240	$481,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

Eisenhower Elementary School

- disconnected downspouts
- pervious pavement
- bioretention / rain gardens
- bioswales
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 75' 150'

GRANDVIEW ELEMENTARY SCHOOL

Subwatershed: **Ambrose Brook**

Site Area: **1,080,642 sq. ft.**

Address: **130 North Randolphville Road**
Piscataway, NJ, 08854

Block and Lot: **Block 2,601, Lot 12.02**

Parking spaces can be replaced with pervious pavement to infiltrate stormwater. Rain gardens can be installed in the front and back of the school to capture, treat, and infiltrate roof runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
16	173,993	8.4	87.9	798.9	0.136	4.77

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.446	75	32,725	1.23	3,765	$18,825
Pervious pavements	1.931	323	141,634	5.33	11,810	$295,250

GREEN INFRASTRUCTURE RECOMMENDATIONS

Grandview Elementary School

- disconnected downspouts
- pervious pavement
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 75' 150'

JOHN F. KENNEDY LIBRARY

Subwatershed: Ambrose Brook

Site Area: 329,466 sq. ft.

Address: 500 Hoes Lane
Piscataway, NJ 08854

Block and Lot: Block 10,402, Lot 6.01

Sediment currently builds up around the islands of the southern parking lot. Rain gardens can be built to capture, treat, and infiltrate this parking lot runoff as well as roof runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
50	163,196	7.9	82.4	749.3	0.127	4.48

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.584	98	42,860	0.61	4,485	$22,425
Pervious pavements	0.276	46	20,271	0.76	3,835	$95,875

GREEN INFRASTRUCTURE RECOMMENDATIONS

John F. Kennedy Library

- disconnected downspouts
- pervious pavement
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

MIDDLESEX COUNTY VOCATIONAL AND TECHNICAL HIGH SCHOOL

Subwatershed: **Ambrose Brook**

Site Area: **2,270,440 sq. ft.**

Address: **21 Suttons Lane**
Piscataway, NJ 08854

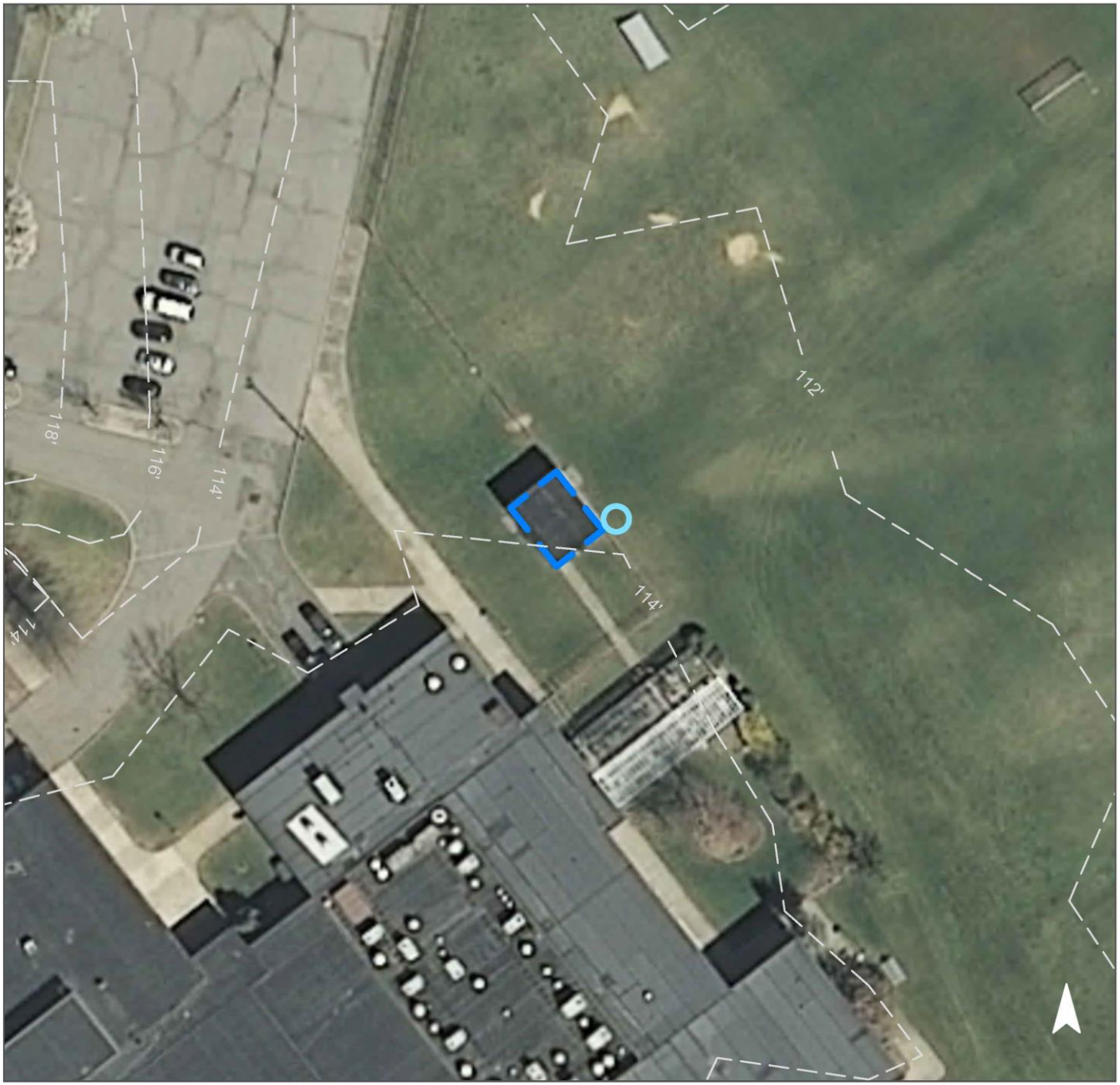
Block and Lot: **Block 9,301, Lot 47.03**

Rainwater can be harvested by installing a cistern at a building located near the baseball field. The water can be used for watering the landscaping or for conducting car wash fundraisers. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
42	952,473	45.9	481.0	4373.2	0.742	26.12

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximu7 Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Rainwater harvesting systems	0.018	3	1,000	0.05	1,000 (gal)	$2,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Middlesex County Vocational and Technical High School

- rainwater harvesting
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 30' 60'

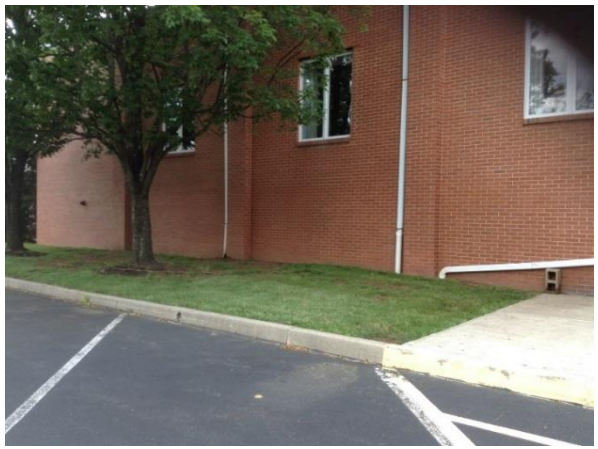
NEW DUNHAM CHAPEL

Subwatershed: **Ambrose Brook**

Site Area: **260,837 sq. ft.**

Address: **225 New Durham Road**
Piscataway, NJ 08854

Block and Lot: **Block 8,705, Lot 2.01**

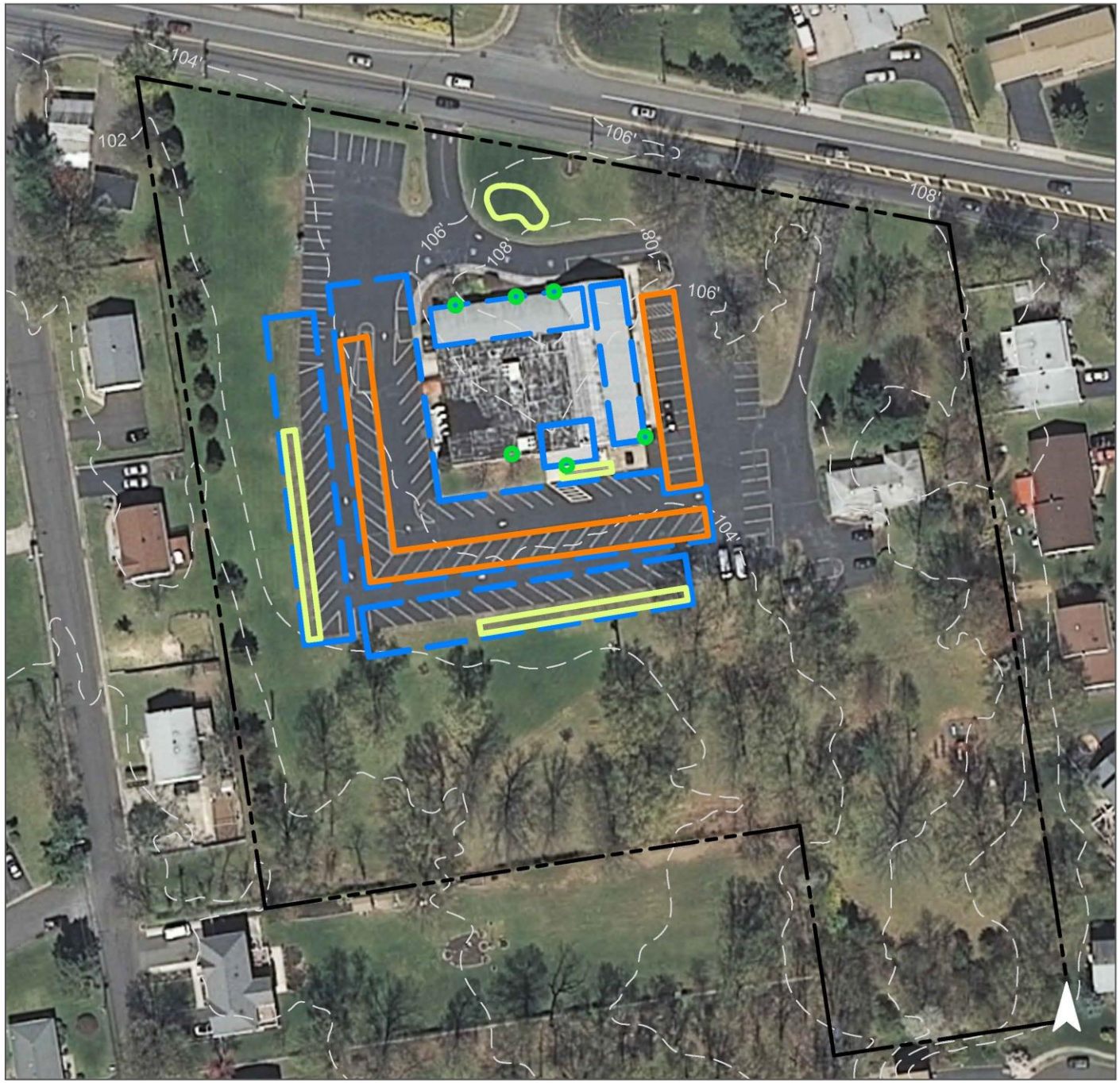


Parking spaces can be converted into pervious pavement to infiltrate water from the roof. Rain gardens can be installed to capture, treat, and infiltrate stormwater. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
39	100,605	4.9	50.8	461.9	0.078	2.76

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.448	75	32,875	1.24	3,100	$15,500
Pervious pavements	0.548	92	40,212	1.51	9,300	$232,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



New Dunham Chapel

- disconnected downspouts
- pervious pavement
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

PISCATAWAY BOARD OF OPERATIONS COMPLEX

Subwatershed: **Ambrose Brook**

Site Area: **1,427,698 sq. ft.**

Address: **13 Ethel Road**
Piscataway, NJ 08854

Block and Lot: **Block 8,901, Lot 1.05**

The parking lot south of the buildings can be re-graded so that sheet flow is directed towards an existing bioswale. Parking spots in front can be replaced with porous asphalt to collect and infiltrate stormwater. The installation of a bioswale on the north lawn can manage runoff from the road. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
39	550,996	26.6	278.3	2,529.8	0.429	15.11

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioswales	1.851	310	135,687	5.10	10,925	$54,625
Pervious pavements	0.301	50	22,066	0.83	3,580	$89,500

GREEN INFRASTRUCTURE RECOMMENDATIONS

Piscataway Board of Operations Complex

- disconnected downspouts
- pervious pavement
- bioswales
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

PISCATAWAY MUNICIPAL CENTER

Subwatershed: Ambrose Brook

Site Area: 764,069 sq. ft.

Address: 505 Sidney Road
Piscataway, NJ 08854

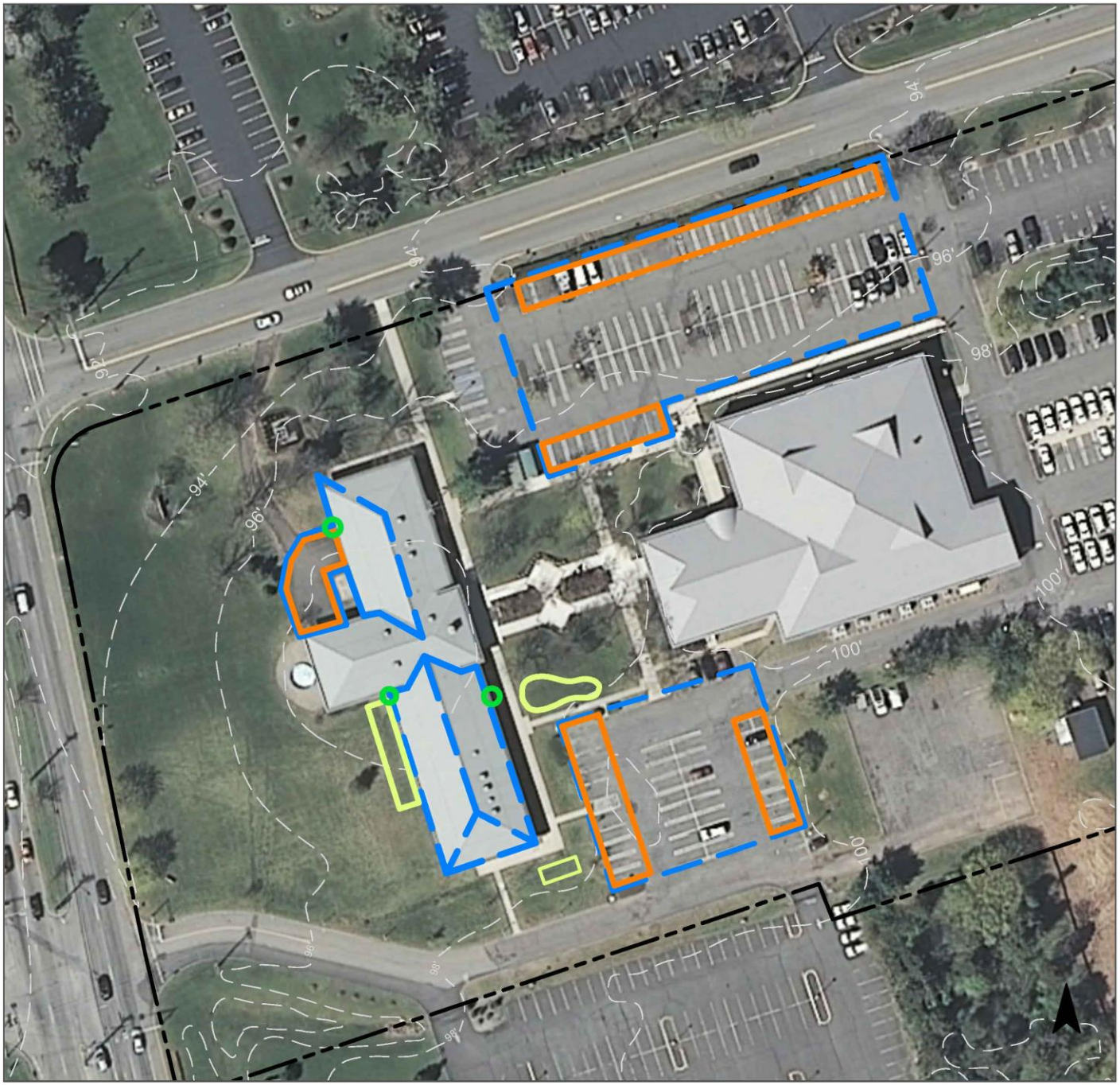
Block and Lot: Block 7,501, Lot 27.03

Rain gardens can capture, treat, and infiltrate rooftop runoff. Parking spaces can be converted into pervious pavement to infiltrate runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
68	521,096	25.1	263.2	2,392.5	0.406	14.29

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.201	34	14,773	0.55	1,940	$9,700
Pervious pavements	1.337	224	98,063	3.69	11,820	$295,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



Piscataway Municipal Center

- disconnected downspouts
- pervious pavement
- bioretention / rain gardens
- drainage areas
- property line
- m2012 Aerial: NJOIT, OGIS

0 50' 100'

POSSUMTOWN VOLUNTEER FIRE CO.

Subwatershed: **Ambrose Brook**

Site Area: **53,322 sq. ft.**

Address: **85 Strattom Street**
Piscataway, NJ 08854

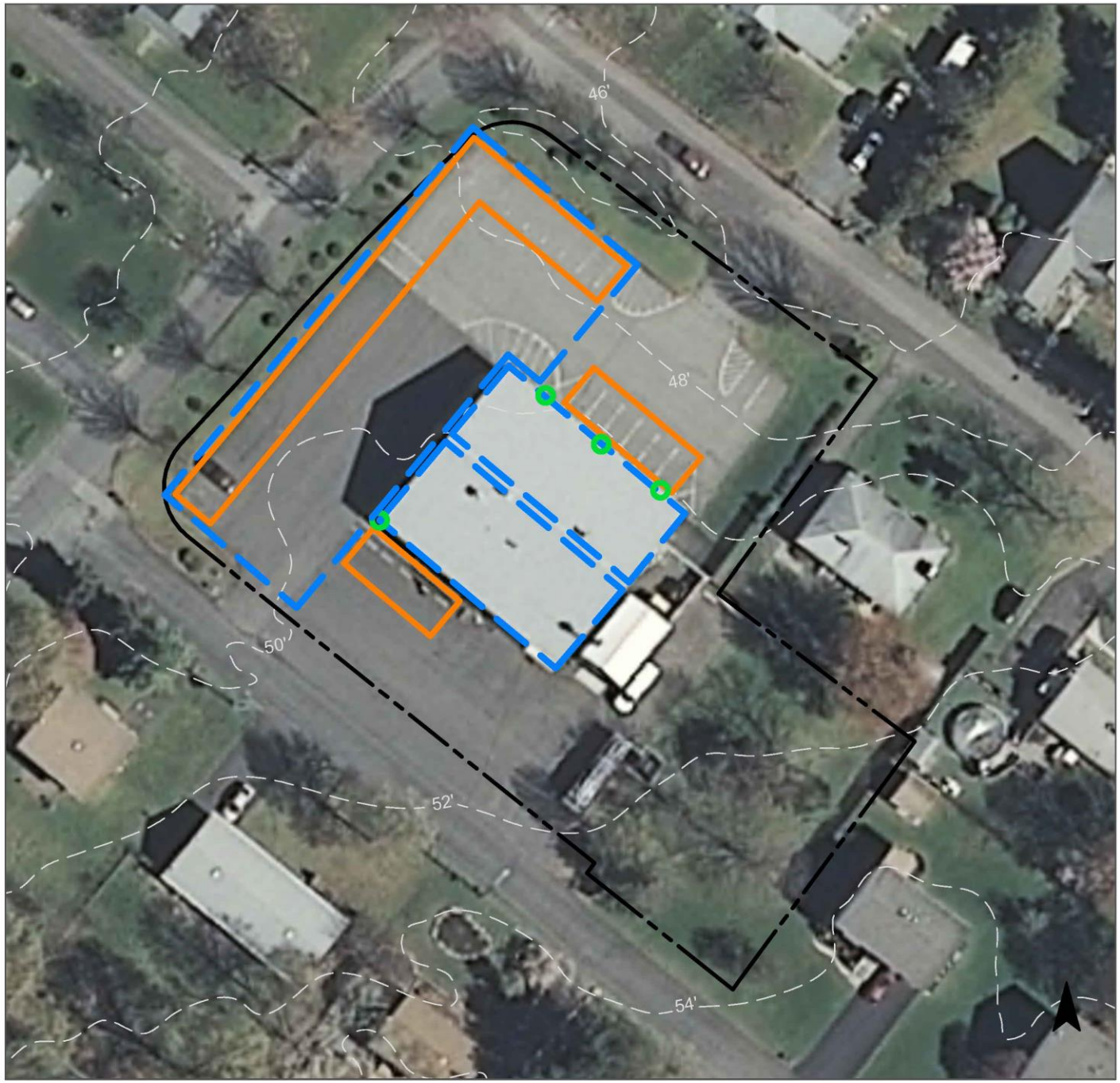
Block and Lot: **Block 3,902, Lot 22.03**

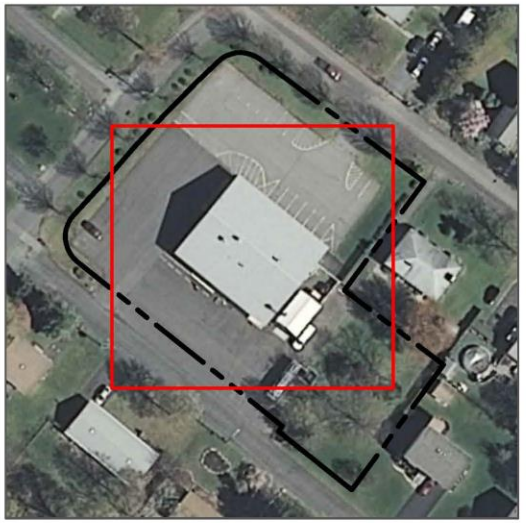
Rows of parking spaces can be replaced with pervious pavement to infiltrate roof and parking lot runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
70	37,124	1.8	18.7	170.4	0.029	1.02

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Pervious pavements	0.538	90	39,494	1.49	6,170	$154,250

GREEN INFRASTRUCTURE RECOMMENDATIONS





Possumtown Volunteer Fire Co.

- disconnected downspouts
- pervious pavement
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 30' 60'

RANDOLPHVILLE SCHOOL

Subwatershed: **Ambrose Brook**

Site Area: **716,679 sq. ft.**

Address: **1 Suttie Avenue**
Piscataway, NJ, 08854

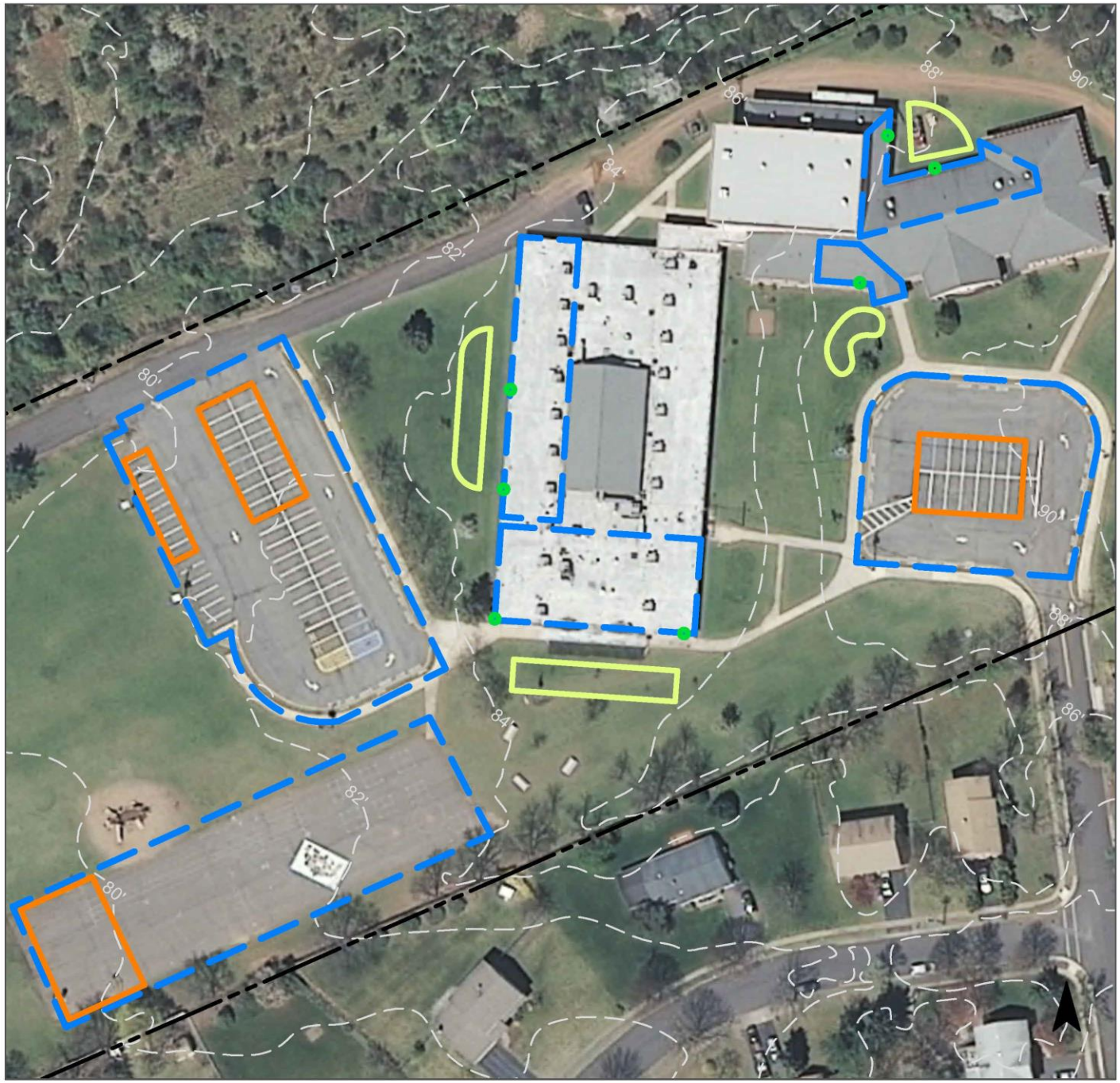
Block and Lot: **Block 5,901, Lot 4.01**

Several rain gardens can be installed to capture, treat, and infiltrate roof runoff. Parking spots can be replaced with pervious pavement to infiltrate runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
22	157,990	7.6	79.8	725.4	0.123	4.33

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.532	89	39,008	1.47	5,755	$28,775
Pervious pavements	1.946	326	142,718	5.37	12,205	$305,125

GREEN INFRASTRUCTURE RECOMMENDATIONS



Randolphville School

- disconnected downspouts
- pervious pavement
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

TRAVELERS FELLOWSHIP CHURCH

Subwatershed: **Ambrose Brook**

Site Area: **76,108 sq. ft.**

Address: **33 Poplar Road**
Piscataway, NJ 08854

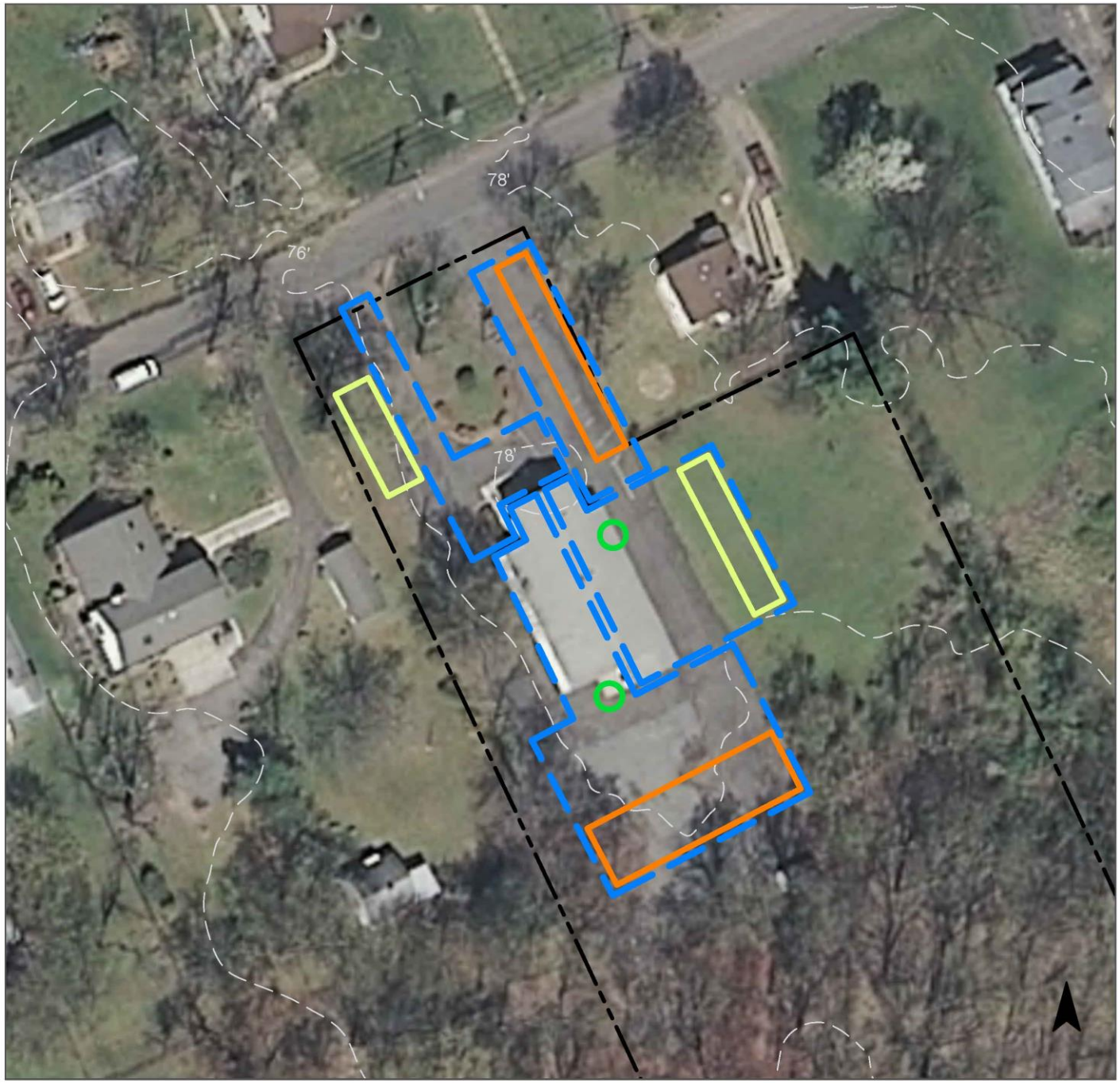
Block and Lot: **Block 8,405, Lot 10.01**

The southern parking lot is in fair condition and can be converted to pervious pavement, as well as a row of parking spaces by the driveway to allow stormwater to infiltrate. Rain gardens can capture, treat, and infiltrate runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
28	21,028	1.0	10.6	96.5	0.016	0.58

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.188	32	13,801	0.52	1,490	$7,450
Pervious pavements	0.274	46	20,084	0.76	3,150	$78,750

GREEN INFRASTRUCTURE RECOMMENDATIONS



Travelers Fellowship Church

- disconnected downspouts
- pervious pavement
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 30' 60'

T. SCHOR MIDDLE SCHOOL

Subwatershed: **Ambrose Brook**

Site Area: **1,024,128 sq. ft.**

Address: **243 North Randolphville Road**
Piscataway, NJ, 08854

Block and Lot: **Block 2,402, Lot 11.01**

Stormwater planters can be installed on the island in the parking lot to manage stormwater. Downspouts can also be disconnected so that runoff from the rooftop can be captured, treated, and infiltrated by rain gardens. Parking spaces can be replaced with porous asphalt to infiltrate runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
25	251,861	12.1	127.2	1,156.4	0.196	6.91

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.647	108	47,461	1.79	5,620	$28,100
Pervious pavements	1.383	231	101,391	3.81	7,070	$176,750

GREEN INFRASTRUCTURE RECOMMENDATIONS

T. Schor Middle School

- disconnected downspouts
- pervious pavement
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 75' 150'

US POST OFFICE

Subwatershed: **Ambrose Brook**

Site Area: **133,918 sq. ft.**

Address: **3 Skiles Avenue**
Piscataway, NJ 08854

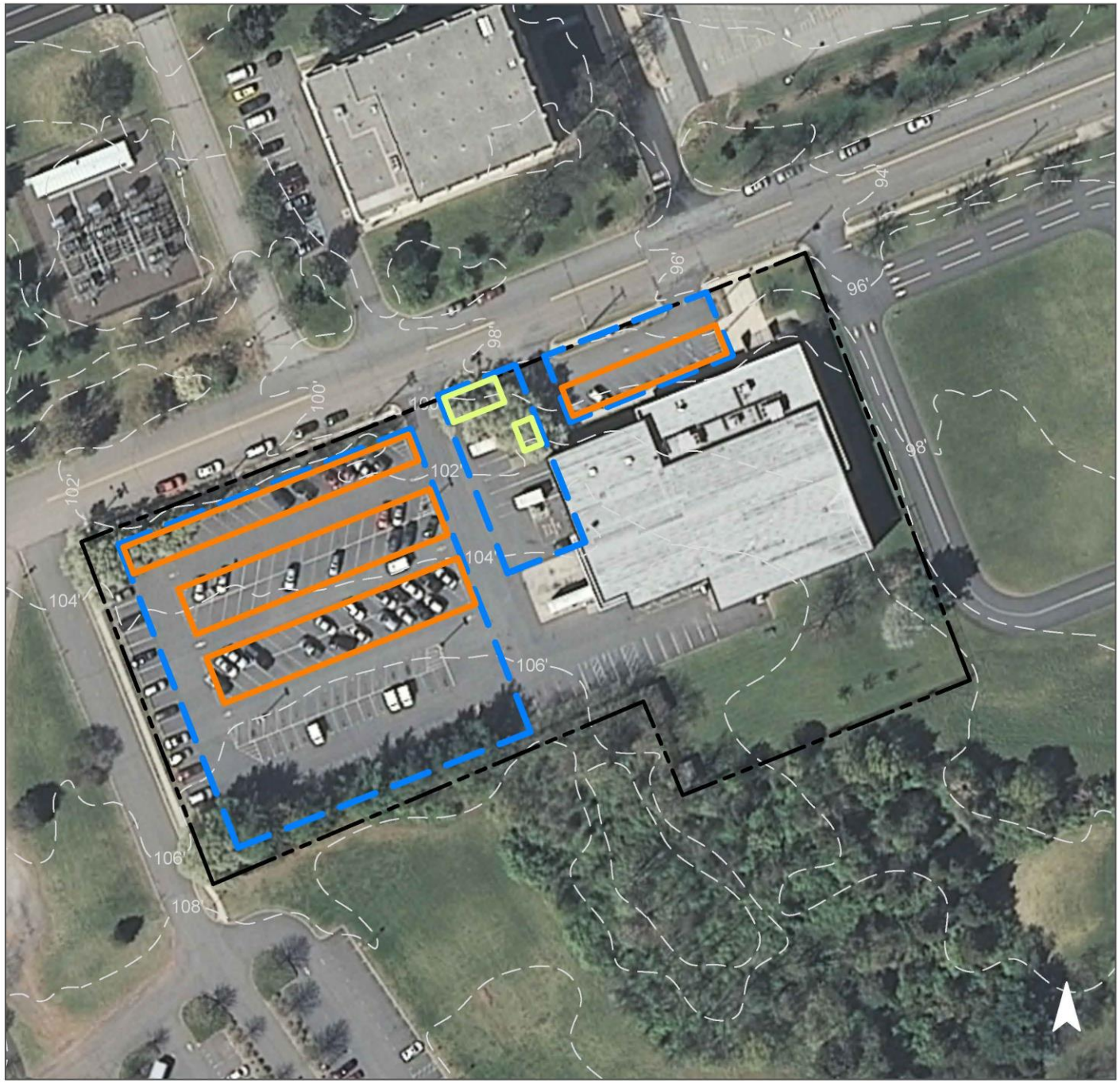
Block and Lot: **Block 10,402, Lot 2.02**

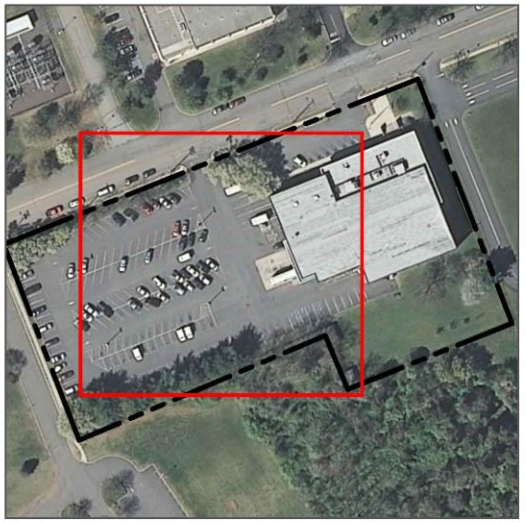
The parking lot is in good condition. Parking spaces can be converted into pervious pavement in the future, to infiltrate runoff. Rain gardens can be installed to capture, treat, and infiltrate runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
80	107,519	5.2	54.3	493.7	0.084	2.95

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.178	30	13,015	0.49	840	$4,200
Pervious pavements	1.284	215	94,173	3.54	17,260	$431,500

GREEN INFRASTRUCTURE RECOMMENDATIONS





US Post Office

- pervious pavement
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

WYNNEWOOD SWIM CLUB

Subwatershed: Ambrose Brook

Site Area: 52,053 sq. ft.

Address: 90 Hancock Road
Piscataway, NJ, 08854

Block and Lot: Block 6,501, Lot 12

The parking lot is currently made of gravel and should remain pervious. A rain garden can be installed in an existing depression adjacent to the parking lot to capture, treat, and infiltrate road runoff. Another rain garden can capture, treat, and infiltrate roof runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
25	12,807	0.6	6.5	58.8	0.010	0.35

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.116	19	8,475	0.32	1,090	$5,450

GREEN INFRASTRUCTURE RECOMMENDATIONS

Wynnewood Swim Club

- disconnected downspouts
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 30' 60'

FIRST BAPTIST CHURCH OF NEW MARKET

Subwatershed: **Bound Brook**

Site Area: **63,594 sq. ft.**

Address: **450 New Market Road**
Piscataway, NJ 08854

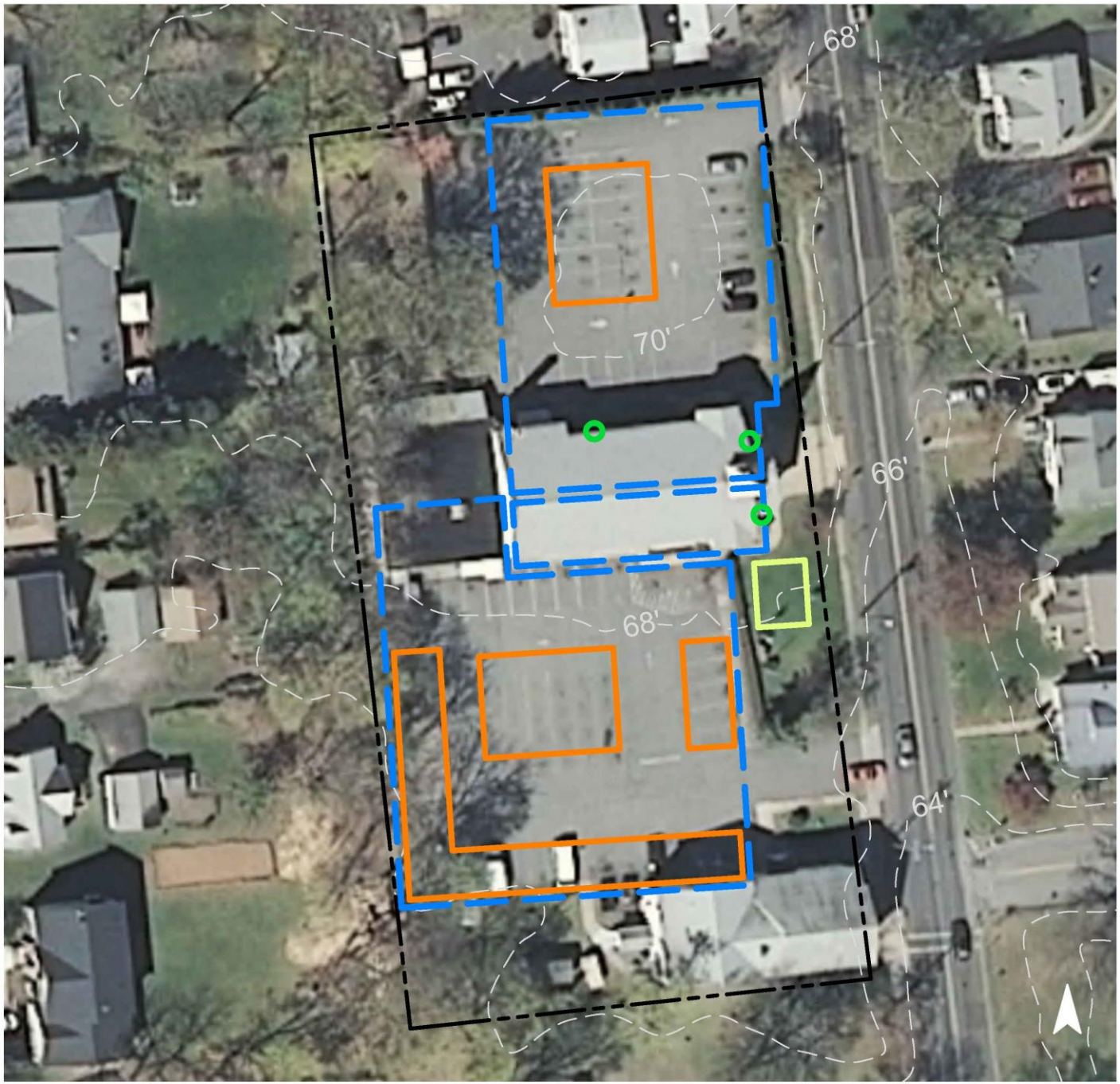
Block and Lot: **Block 913, Lot 3.01**

Parking spaces can be replaced with pervious pavement to infiltrate runoff. Downspouts can be disconnected and directed into a rain garden to capture, treat, and infiltrate roof runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
83	52,471	2.5	26.5	240.9	0.041	1.44

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.064	11	4,675	0.18	500	$2,500
Pervious pavements	0.895	150	65,637	2.47	8,775	$219,375

GREEN INFRASTRUCTURE RECOMMENDATIONS



First Baptist Church of New Market

- disconnected downspouts
- pervious pavement
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 30' 60'

PISCATAWAY PUBLIC LIBRARY

Subwatershed: **Bound Brook**

Site Area: **74,635 sq. ft.**

Address: **20 Murray Avenue**
Piscataway, NJ 08854

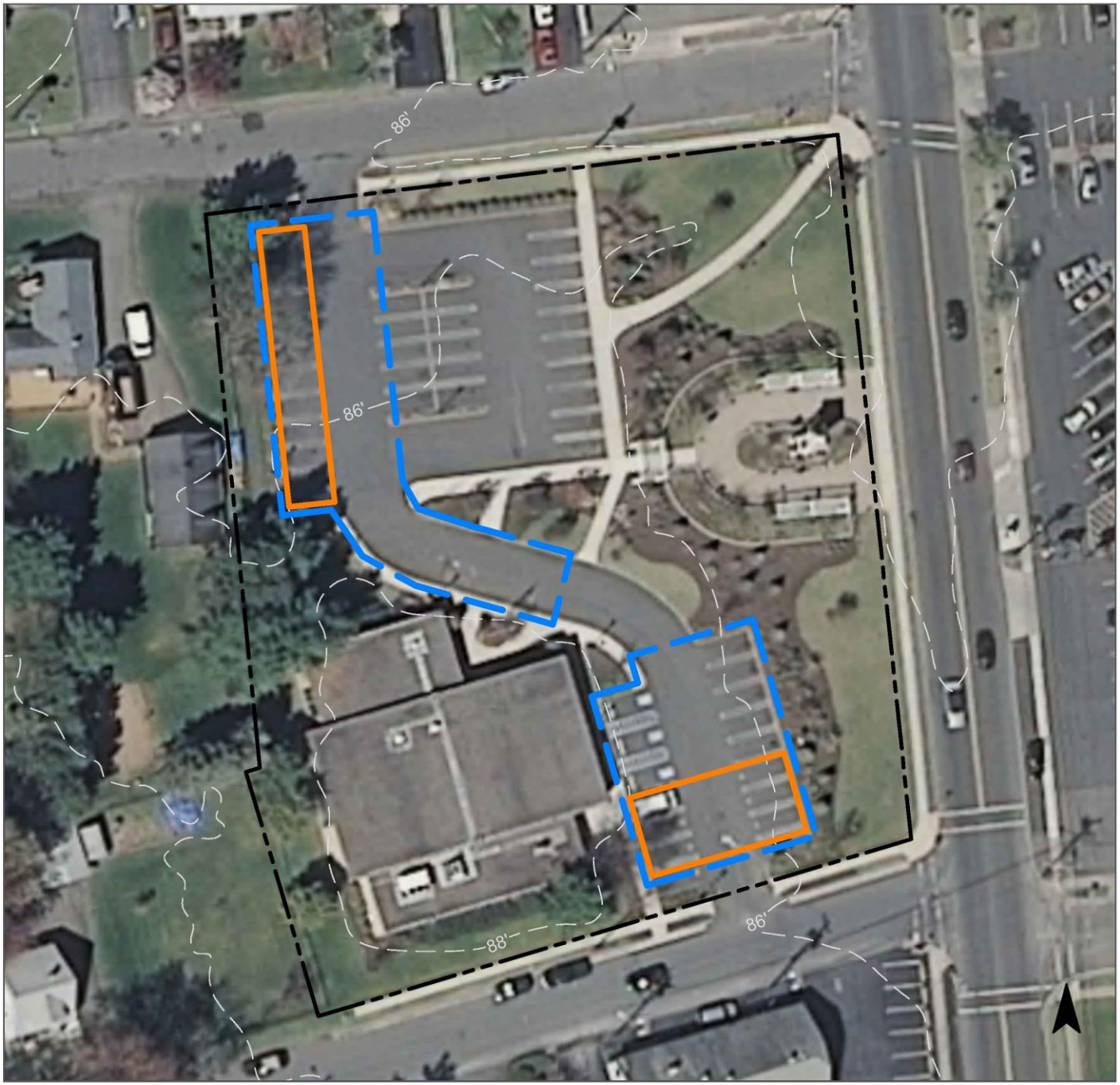
Block and Lot: **Block 1,906, Lot 6.01**

At the time of the assessment the parking lot had been recently paved. Rows of parking spaces can be converted to pervious pavement in the future to infiltrate runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
47	35,036	1.7	17.7	160.9	0.027	0.96

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Pervious pavements	0.361	60	26,479	1.0	3,9745	$99,375

GREEN INFRASTRUCTURE RECOMMENDATIONS



Piscataway Public Library

- pervious pavement
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 30' 60'

QUIBBLETOWN MIDDLE SCHOOL

Subwatershed: **Bound Brook**

Site Area: **593,304 sq. ft.**

Address: **99 Academy Street**
Piscataway, NJ, 08854

Block and Lot: **Block 1,406, Lot 1.02**

Parking spaces can be converted into pervious pavement to infiltrate runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
35	206,973	10	104.5	950.3	0.161	5.68

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Pervious pavements	0.850	142	62,308	2.34	5,445	$136,125

GREEN INFRASTRUCTURE RECOMMENDATIONS

Quibbletown Middle School

- pervious pavement
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

ARBOR INTERMEDIATE SCHOOL

Subwatershed: Green Brook

Site Area: 358,181 sq. ft.

Address: 1717 Lester Place
Piscataway, NJ, 08854

Block and Lot: Block 304, Lot 1.01

Rain gardens can capture, treat, and infiltrate runoff from the roof. Parking spaces can be replaced with pervious pavement to infiltrate runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
41	145,137	7	73.3	666.4	0.113	3.98

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.403	68	29,583	1.11	3,900	$19,500
Pervious pavements	0.972	163	71,284	2.68	5,590	$139,750

GREEN INFRASTRUCTURE RECOMMENDATIONS

Arbor Intermediate School

- disconnected downspouts
- pervious pavement
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

CONACKAWACK MIDDLE SCHOOL

Subwatershed: Lower Raritan

Site Area: 762,264 sq. ft.

Address: 5205 Witherspoon Street
Piscataway, NJ, 08854

Block and Lot: Block 10,402, Lot 1.01

Rain gardens can be installed to capture, treat, and infiltrate roof runoff. Parking spaces can be converted into pervious pavement to infiltrate stormwater. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
21	159,868	7.7	80.7	734.0	0.125	4.38

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	1.311	219	96,118	3.62	12,575	$62,875
Pervious pavements	1.032	173	75,698	2.85	5,110	$127,750

GREEN INFRASTRUCTURE RECOMMENDATIONS

Conackawack Middle School

- disconnected downspouts
- pervious pavement
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 75' 150'

KNOLLWOOD ELEMENTARY SCHOOL

Subwatershed: Lower Raritan

Site Area: 361,950 sq. ft.

Address: 333 Willow Avenue
Piscataway, NJ, 08854

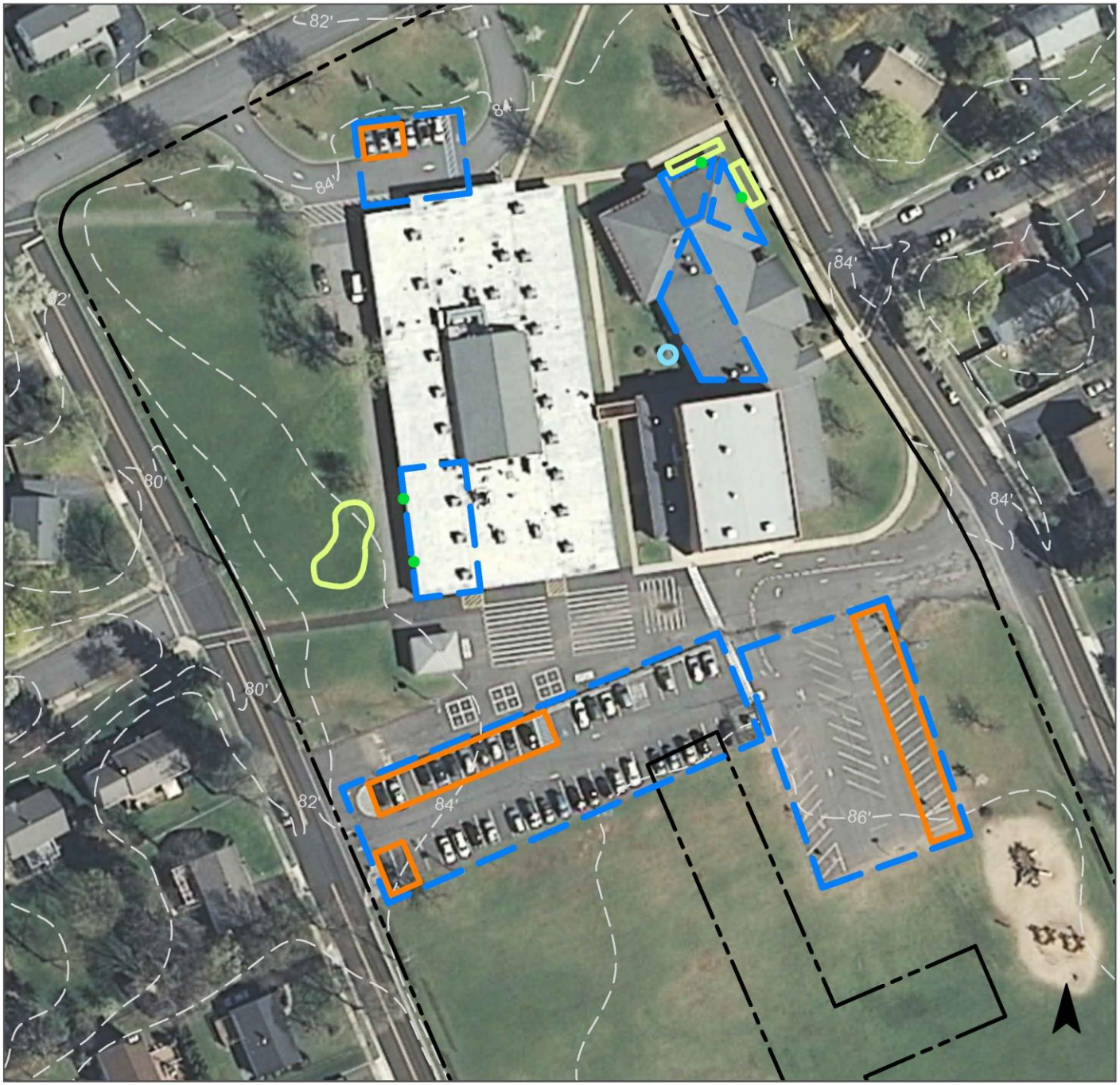
Block and Lot: Block 7,107, Lot 1

A rainwater harvesting system can be installed in the courtyard next to an existing community garden. The harvested water can be used to water the garden. Parking spots can be replaced with porous asphalt to infiltrate parking lot runoff. Rain gardens can be built to capture, treat, and infiltrate roof runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
42	150,725	7.3	76.1	692.0	0.117	4.13

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.134	22	9,836	0.37	1,820	$9,100
Pervious pavements	1.079	181	79,138	2.98	7,260	$181,500
Rainwater harvesting systems	0.082	14	3,000	0.23	3,000 (gal)	$6,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Knollwood Elementary School

- disconnected downspouts
- pervious pavement
- bioretention / rain gardens
- rainwater harvesting
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

SAINT GEORGE CHURCH

Subwatershed: Lower Raritan

Site Area: 182,176 sq. ft.

Address: 1101 River Road
Piscataway, NJ 08854

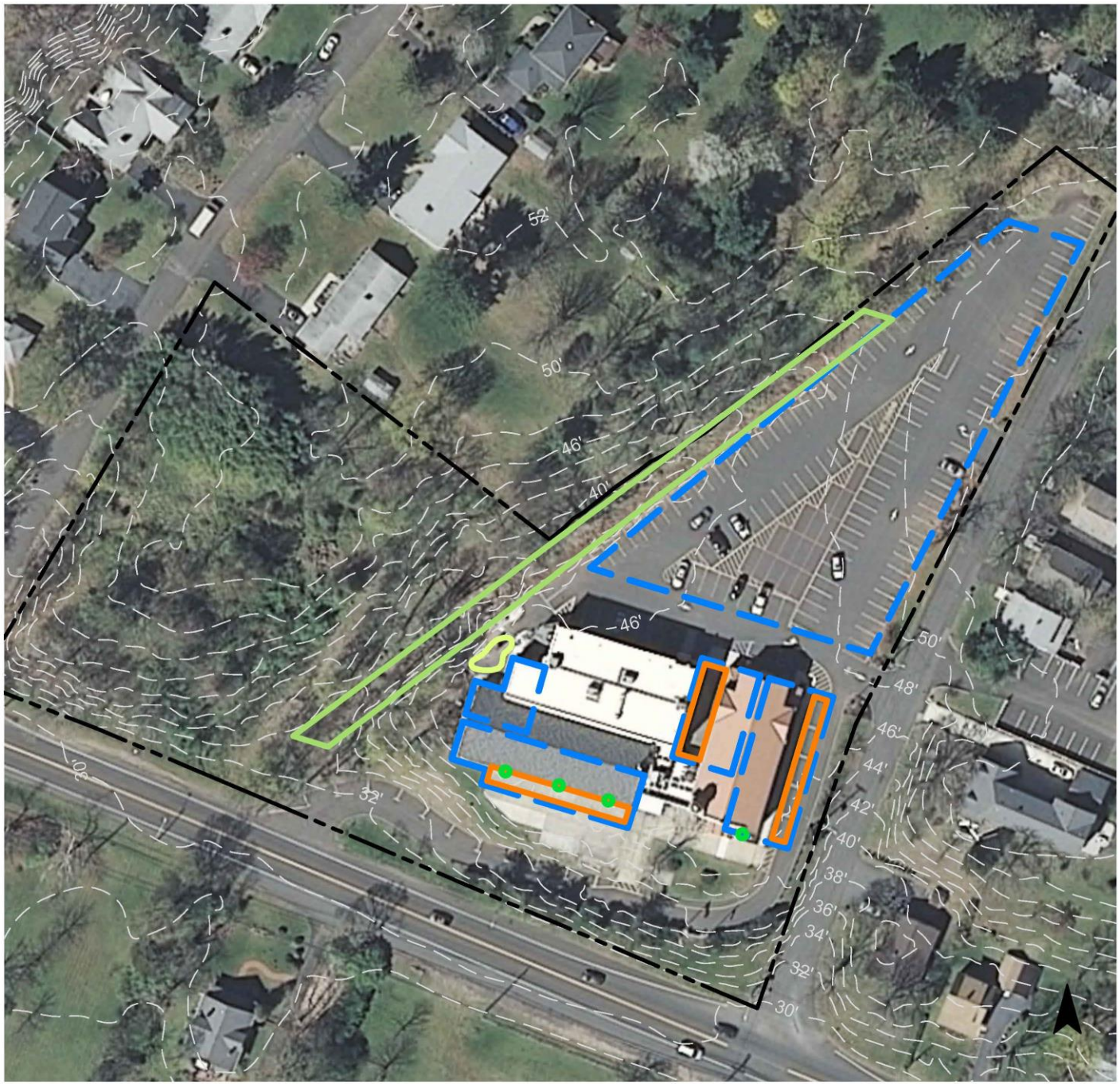
Block and Lot: Block 11,901, Lot 23.1

Sheet flow from the parking lot is currently being directed into an existing bioswale to the north. A rain garden can be installed to capture, treat, and infiltrate roof runoff. Parking spaces can be replaced with pervious pavement to infiltrate additional runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
46	84,203	4.1	42.5	386.6	0.066	2.31

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.037	6	2,730	0.10	315	$1,575
Bioswales	0.935	157	68,592	2.58	8,130	$40,650
Pervious pavements	0.296	50	21,729	0.82	2,720	$68,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Saint George Church

- disconnected downspouts
- bioswale
- pervious pavement
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

ZION HILL BAPTIST CHURCH

Subwatershed: **Lower Raritan**

Site Area: **44,164 sq. ft.**

Address: **450 Highland Avenue**
Piscataway, NJ 08854

Block and Lot: **Block 10,408, Lot 24.01**

Most downspouts are disconnected and direct runoff into the existing turf grass. A rain garden can capture, treat, and infiltrate this runoff. The parking lot is in fair condition. Parking spaces can be converted into pervious pavement to infiltrate additional runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
64	28,257	1.4	14.3	129.7	0.022	0.77

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximu7 Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.049	8	3,628	0.14	390	$1,950
Pervious pavements	0.638	107	46,787	1.76	4,870	$121,750

GREEN INFRASTRUCTURE RECOMMENDATIONS

Zion Hill Baptist Church

- disconnected downspouts
- pervious pavement
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 25' 50'

d. Summary of Existing Conditions

Summary of Existing Site Conditions

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	Existing Annual Loads			I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C.	
					TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)				Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (Mgal)
AMBROSE BROOK SUBWATERSHED	**204.71**	**8,916,993**			**163.4**	**1,711.6**	**15,559.7**		**77.80**	**3,388,906**	**2.641**	**92.95**
Christ United Methodist Church												
Total Site Info	4.71	205,215	7501	25	4.9	51.8	470.6	50	2.35	102,505	0.080	2.81
Eisenhower Elementary School												
Total Site Info	11.99	522,418	2102	5	11.4	119.0	1,082.2	45	5.41	235,714	0.184	6.46
Grandview Elementary School												
Total Site Info	24.81	1,080,642	2601	12.02	8.4	87.9	798.9	16	3.99	173,993	0.136	4.77
John F. Kennedy Library												
Total Site Info	7.56	329,466	10402	6.01	7.9	82.4	749.3	50	3.75	163,196	0.127	4.48
Middlesex County Vocational and Technical High School												
Total Site Info	52.12	2,270,440	9301	47.03	45.9	481.0	4,373.2	42	21.87	952,473	0.742	26.12
New Dunham Chapel												
Total Site Info	5.99	260,837	8705	2.01	4.9	50.8	461.9	39	2.31	100,605	0.078	2.76
Piscataway Board of Operations Complex												
Total Site Info	32.78	1,427,698	8901	1.05	26.6	278.3	2,529.8	39	12.65	550,996	0.429	15.11
Piscataway Municipal Center												
Total Site Info	17.54	764,069	7501	27.03	25.1	263.2	2,392.5	68	11.96	521,096	0.406	14.29
Possumtown Volunteer Fire Co.												
Total Site Info	1.22	53,322	3902	22.03	1.8	18.7	170.4	70	0.85	37,124	0.029	1.02
Randolphville School												
Total Site Info	16.45	716,679	5901	4.01	7.6	79.8	725.4	22	3.63	157,990	0.123	4.33
Travelers Fellowship Church												
Total Site Info	1.75	76,108	8405	10.01	1.0	10.6	96.5	28	0.48	21,028	0.016	0.58

Summary of Existing Site Conditions

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	Existing Annual Loads TP (lb/yr)	Existing Annual Loads TN (lb/yr)	Existing Annual Loads TSS (lb/yr)	I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Runoff Volumes from I.C. Annual (Mgal)
T. Schor Middle School												
Total Site Info	23.51	1,024,128	2402	11.01	12.1	127.2	1,156.4	25	5.78	251,861	0.196	6.91
US Post Office												
Total Site Info	3.07	133,918	10402	2.02	5.2	54.3	493.7	80	2.47	107,519	0.084	2.95
Wynnewood Swim Club												
Total Site Info	1.19	52,053	6501	12	0.6	6.5	58.8	25	0.29	12,807	0.010	0.35
BOUND BROOK SUBWATERSHED	**14.73**	**641,533**			**14.2**	**148.7**	**1,352.1**		**6.76**	**294,480**	**0.229**	**8.08**
First Baptist Church of New Market												
Total Site Info	1.46	63,594	913	3.01	2.5	26.5	240.9	83	1.20	52,471	0.041	1.44
Piscataway Public Library												
Total Site Info	1.71	74,635	1906	6.01	1.7	17.7	160.9	47	0.80	35,036	0.027	0.96
Quibbletown Middle School												
Total Site Info	11.55	503,304	1406	1.02	10.0	104.5	950.3	41	4.75	206,973	0.161	5.68
GREEN BROOK SUBWATERSHED	**8.22**	**358,181**			**7.0**	**73.3**	**666.4**		**3.33**	**145,137**	**0.113**	**3.98**
Arbor Intermediate School												
Total Site Info	8.22	358,181	304	1.01	7.0	73.3	666.4	41	3.33	145,137	0.113	3.98
LOWER RARITAN RIVER SUBWATERSHED	**31.00**	**1,350,554**			**20.4**	**213.7**	**1,942.4**		**9.71**	**423,052**	**0.330**	**11.60**
Conackawack Middle School												
Total Site Info	17.50	762,264	10402	1.01	7.7	80.7	734.0	21	3.67	159,868	0.125	4.38
Knollwood Elementary School												
Total Site Info	8.31	361,950	7107	1	7.3	76.1	692.0	42	3.46	150,724	0.117	4.13

Summary of Existing Site Conditions

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	Existing Annual Loads			I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C.	
					TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)				Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (Mgal)
Saint George Church												
Total Site Info	4.18	182,176	11901	23.1	4.1	42.5	386.6	46	1.93	84,203	0.066	2.31
Zion Hill Baptist Church												
Total Site Info	1.01	44,164	10408	24.01	1.4	14.3	129.7	64	0.65	28,257	0.022	0.77

e. Summary of Proposed Green Infrastructure Practices

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area Area (SF)	Potential Management Area Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cfs)	Size of BMP (SF)	Unit Cost ($)	Unit	Total Cost ($)	I.C. Treated %
	AMBROSE BROOK SUBWATERSHED	**714,225**	**16.40**	**18.609**	**3,115**	**1,364,484**	**50.35**	**161,735**			**$3,059,075**	**21.1%**
1	**Christ United Methodist Church**											
	Bioretention systems/rain gardens	8,040	0.18	0.209	35	15,371	0.58	2,060	5	SF	$10,300	7.8%
	Pervious pavements	42,730	0.98	1.113	186	81,644	3.07	7,230	25	SF	$180,750	41.7%
	Total Site Info	**50,770**	**1.17**	**1.323**	**221**	**97,016**	**3.65**	**9,290**			**$191,050**	**49.5%**
2	**Eisenhower Elementary School**											
	Bioretention systems/rain gardens	9,715	0.22	0.253	42	18,588	0.70	2,365	5	SF	$11,825	4.1%
	Bioswales	7,460	0.17	0.194	33	14,287	0.54	4,630	5	SF	$23,150	3.2%
	Pervious pavements	69,510	1.60	1.811	303	132,807	5.00	19,240	25	SF	$481,000	29.5%
	Total Site Info	**86,685**	**1.99**	**2.259**	**378**	**165,682**	**6.24**	**26,235**			**$515,975**	**36.8%**
3	**Grandview Elementary School**											
	Bioretention systems/rain gardens	17,130	0.39	0.446	75	32,725	1.23	3,765	5	SF	$18,825	9.8%
	Pervious pavements	74,130	1.70	1.931	323	141,634	5.33	11,810	25	SF	$295,250	42.6%
	Total Site Info	**91,260**	**2.10**	**2.378**	**398**	**174,359**	**6.56**	**15,575**			**$314,075**	**52.5%**
4	**John F. Kennedy Library**											
	Bioretention systems/rain gardens	22,420	0.51	0.584	98	42,860	0.61	4,485	5	SF	$22,425	13.7%
	Pervious pavements	10,600	0.24	0.276	46	20,271	0.76	3,835	25	SF	$95,875	6.5%
	Total Site Info	**33,020**	**0.76**	**0.860**	**144**	**63,131**	**1.37**	**8,320**			**$118,300**	**20.2%**
5	**Middlesex County Vocational and Technical High School**											
	Rainwater harvesting systems	675	0.02	0.018	3	1,000	0.05	1,000	2	gal	$2,000	0.1%
	Total Site Info	**675**	**0.02**	**0.018**	**3**	**1,000**	**0.05**	**1,000**			**$2,000**	**0.1%**
6	**New Dunham Chapel**											
	Bioretention systems/rain gardens	17,210	0.40	0.448	75	32,875	1.24	3,100	5	SF	$15,500	17.1%
	Pervious pavements	21,045	0.48	0.548	92	40,212	1.51	9,300	25	SF	$232,500	20.9%
	Total Site Info	**38,255**	**0.88**	**0.997**	**167**	**73,087**	**2.75**	**12,400**			**$248,000**	**38.0%**
7	**Piscataway Board of Operations Complex**											
	Bioswales	71,025	1.63	1.851	310	135,687	5.10	10,925	5	SF	$54,625	12.9%
	Pervious pavements	11,545	0.27	0.301	50	22,066	0.83	3,580	25	SF	$89,500	2.1%
	Total Site Info	**82,570**	**1.90**	**2.151**	**360**	**157,753**	**5.93**	**14,505**			**$144,125**	**15.0%**

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area Area (SF)	Potential Management Area Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cfs)	Size of BMP (SF)	Unit Cost ($)	Unit	Total Cost ($)	I.C. Treated %
8	**Piscataway Municipal Center**											
	Bioretention systems/rain gardens	7,720	0.18	0.201	34	14,773	0.55	1,940	5	SF	$9,700	1.5%
	Pervious pavements	51,315	1.18	1.337	224	98,063	3.69	11,820	25	SF	$295,500	9.8%
	Total Site Info	**59,035**	**1.36**	**1.538**	**257**	**112,836**	**4.24**	**13,760**			**$305,200**	**11.3%**
9	**Possumtown Volunteer Fire Co.**											
	Pervious pavements	20,665	0.47	0.538	90	39,494	1.49	6,170	25	SF	$154,250	55.7%
	Total Site Info	**20,665**	**0.47**	**0.538**	**90**	**39,494**	**1.49**	**6,170**			**$154,250**	**55.7%**
10	**Randolphville School**											
	Bioretention systems/rain gardens	20,420	0.47	0.532	89	39,008	1.47	5,755	5	SF	$28,775	12.9%
	Pervious pavements	74,685	1.71	1.946	326	142,718	5.37	12,205	25	SF	$305,125	47.3%
	Total Site Info	**95,105**	**2.18**	**2.478**	**415**	**181,727**	**6.84**	**17,960**			**$333,900**	**60.2%**
11	**Travelers Fellowship Church**											
	Bioretention systems/rain gardens	7,225	0.17	0.188	32	13,801	0.52	1,490	5	SF	$7,450	34.4%
	Pervious pavements	10,515	0.24	0.274	46	20,084	0.76	3,150	25	SF	$78,750	50.0%
	Total Site Info	**17,740**	**0.41**	**0.462**	**77**	**33,884**	**1.28**	**4,640**			**$86,200**	**84.4%**
12	**T. Schor Middle School**											
	Bioretention systems/rain gardens	24,840	0.57	0.647	108	47,461	1.79	5,620	5	SF	$28,100	9.9%
	Pervious pavements	53,070	1.22	1.383	231	101,391	3.81	7,070	25	SF	$176,750	21.1%
	Total Site Info	**77,910**	**1.79**	**2.030**	**340**	**148,852**	**5.60**	**12,690**			**$204,850**	**30.9%**
13	**US Post Office**											
	Bioretention systems/rain gardens	6,820	0.16	0.178	30	13,015	0.49	840	5	SF	$4,200	6.3%
	Pervious pavements	49,280	1.13	1.284	215	94,173	3.54	17,260	25	SF	$431,500	45.8%
	Total Site Info	**56,100**	**1.29**	**1.462**	**245**	**107,188**	**4.03**	**18,100**			**$435,700**	**52.2%**
14	**Wynnewood Swim Club**											
	Bioretention systems/rain gardens	4,435	0.10	0.116	19	8,475	0.32	1,090	5	SF	$5,450	34.6%
	Total Site Info	**4,435**	**0.10**	**0.116**	**19**	**8,475**	**0.32**	**1,090**			**$5,450**	**34.6%**

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area Area (SF)	Potential Management Area Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cfs)	Size of BMP (SF)	Unit Cost ($)	Unit	Total Cost ($)	I.C. Treated %
	BOUND BROOK SUBWATERSHED	**83,250**	**1.91**	**2.169**	**363**	**159,100**	**5.99**	**18,695**			**$457,375**	**28.3%**
15	**First Baptist Church of New Market**											
	Bioretention systems/rain gardens	2,445	0.06	0.064	11	4,675	0.18	500	5	SF	$2,500	4.7%
	Pervious pavements	34,340	0.79	0.895	150	65,637	2.47	8,775	25	SF	$219,375	65.4%
	Total Site Info	**36,785**	**0.84**	**0.958**	**160**	**70,312**	**2.65**	**9,275**			**$221,875**	**70.1%**
16	**Piscataway Public Library**											
	Pervious pavements	13,855	0.32	0.361	60	26,479	1.00	3,975	25	SF	$99,375	39.5%
	Total Site Info	**13,855**	**0.32**	**0.361**	**60**	**26,479**	**1.00**	**3,975**			**$99,375**	**39.5%**
17	**Quibbletown Middle School**											
	Pervious pavements	32,610	0.75	0.850	142	62,308	2.34	5,445	25	SF	$136,125	15.8%
	Total Site Info	**32,610**	**0.75**	**0.850**	**142**	**62,308**	**2.34**	**5,445**			**$136,125**	**15.8%**
	GREEN BROOK SUBWATERSHED	**52,790**	**1.21**	**1.375**	**230**	**100,868**	**3.79**	**9,490**			**$159,250**	**36.4%**
18	**Arbor Intermediate School**											
	Bioretention systems/rain gardens	15,480	0.36	0.403	68	29,583	1.11	3,900	5	SF	$19,500	10.7%
	Pervious pavements	37,310	0.86	0.972	163	71,284	2.68	5,590	25	SF	$139,750	25.7%
	Total Site Info	**52,790**	**1.21**	**1.375**	**230**	**100,868**	**3.79**	**9,490**			**$159,250**	**36.4%**
	LOWER RARITAN RIVER SUBWATERSHED	**214,680**	**4.93**	**5.594**	**936**	**407,257**	**15.45**	**46,190**			**$621,150**	**50.7%**
19	**Conackawack Middle School**											
	Bioretention systems/rain gardens	50,300	1.15	1.311	219	96,118	3.62	12,575	5	SF	$62,875	31.5%
	Pervious pavements	39,620	0.91	1.032	173	75,698	2.85	5,110	25	SF	$127,750	24.8%
	Total Site Info	**89,920**	**2.06**	**2.343**	**392**	**171,816**	**6.47**	**17,685**			**$190,625**	**56.2%**
20	**Knollwood Elementary School**											
	Bioretention systems/rain gardens	5,140	0.12	0.134	22	9,836	0.37	1,820	5	SF	$9,100	3.4%
	Pervious pavements	41,415	0.95	1.079	181	79,138	2.98	7,260	25	SF	$181,500	27.5%
	Rainwater harvesting systems	3,140	0.07	0.082	14	3,000	0.23	3,000	2	gal	$6,000	2.1%
	Total Site Info	**49,695**	**1.14**	**1.295**	**217**	**91,975**	**3.58**	**12,080**			**$196,600**	**33.0%**

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area Area (SF)	Potential Management Area Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cfs)	Size of BMP (SF)	Unit Cost ($)	Unit	Total Cost ($)	I.C. Treated %
21	**Saint George Church**											
	Bioretention systems/rain gardens	1,425	0.03	0.037	6	2,730	0.10	315	5	SF	$1,575	1.7%
	Bioswales	35,890	0.82	0.935	157	68,592	2.58	8,130	5	SF	$40,650	42.6%
	Pervious pavements	11,370	0.26	0.296	50	21,729	0.82	2,720	25	SF	$68,000	13.5%
	Total Site Info	**48,685**	**1.12**	**1.269**	**212**	**93,051**	**3.50**	**11,165**			**$110,225**	**57.8%**
22	**Zion Hill Baptist Church**											
	Bioretention systems/rain gardens	1,895	0.04	0.049	8	3,628	0.14	390	5	SF	$1,950	6.7%
	Pervious pavements	24,485	0.56	0.638	107	46,787	1.76	4,870	25	SF	$121,750	86.7%
	Total Site Info	**26,380**	**0.61**	**0.687**	**115**	**50,415**	**1.90**	**5,260**			**$123,700**	**93.4%**