RUTGERS
New Jersey Agricultural
Experiment Station

Draft

Impervious Cover Reduction Action Plan
for
Metuchen Borough, Middlesex County, New Jersey

Prepared for Metuchen Borough by the
Rutgers Cooperative Extension Water Resources Program

October 6, 2015

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Introduction

Located in Middlesex County in central New Jersey, Metuchen Borough covers approximately 2.84 square miles within Edison. Figures 1 and 2 illustrate that Metuchen Borough is dominated by urban land uses. A total of 83.8% of the municipality's land use is classified as urban. Of the urban land in Metuchen Borough, 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 Metuchen Borough 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 Metuchen Borough. Based upon the 2007 NJDEP land use/land cover data, approximately 38.5% of Metuchen Borough has impervious cover. This level of impervious cover suggests that the streams in Metuchen Borough are likely non-supporting streams.[1]

Methodology

Metuchen Borough contains portions of three subwatersheds (Figure 1). 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

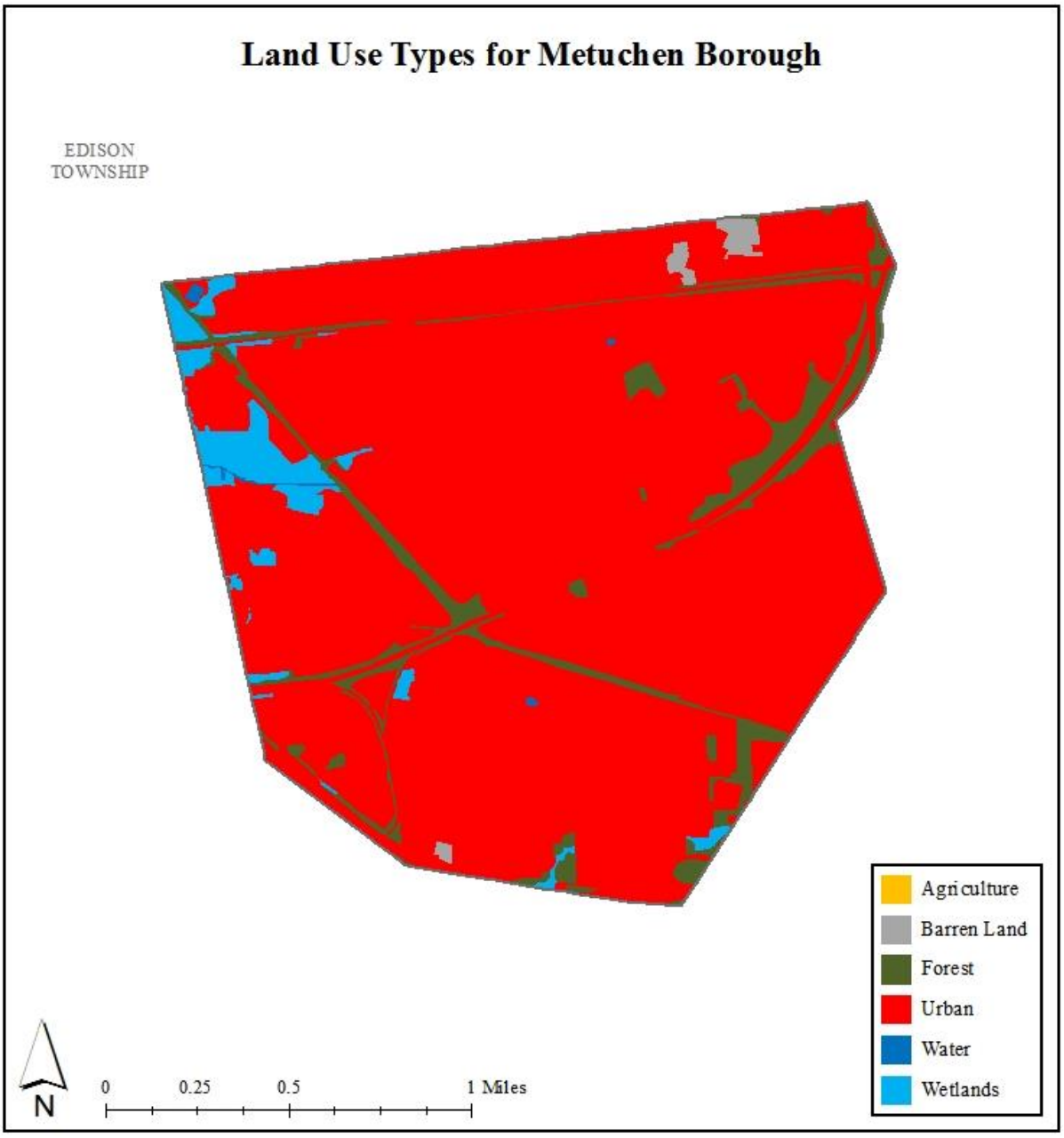


Figure 1: Map illustrating the land use in Metuchen Borough

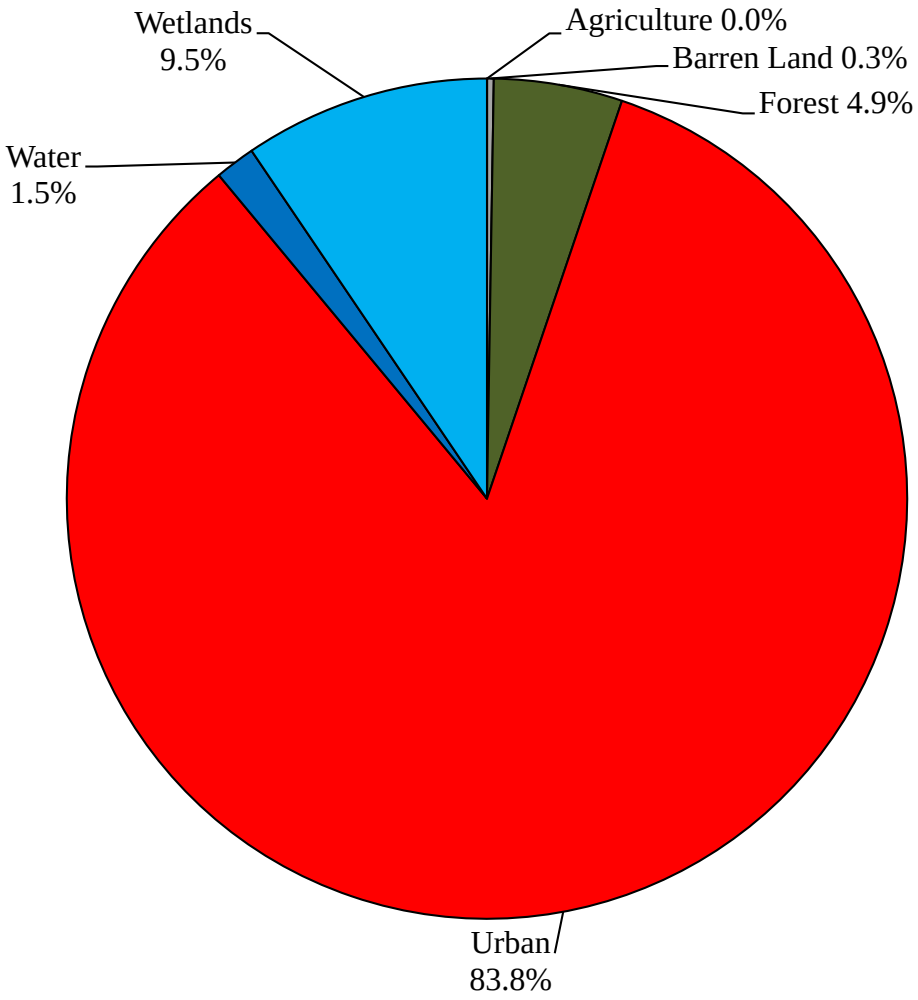


Figure 2: Pie chart illustrating the land use in Metuchen Borough

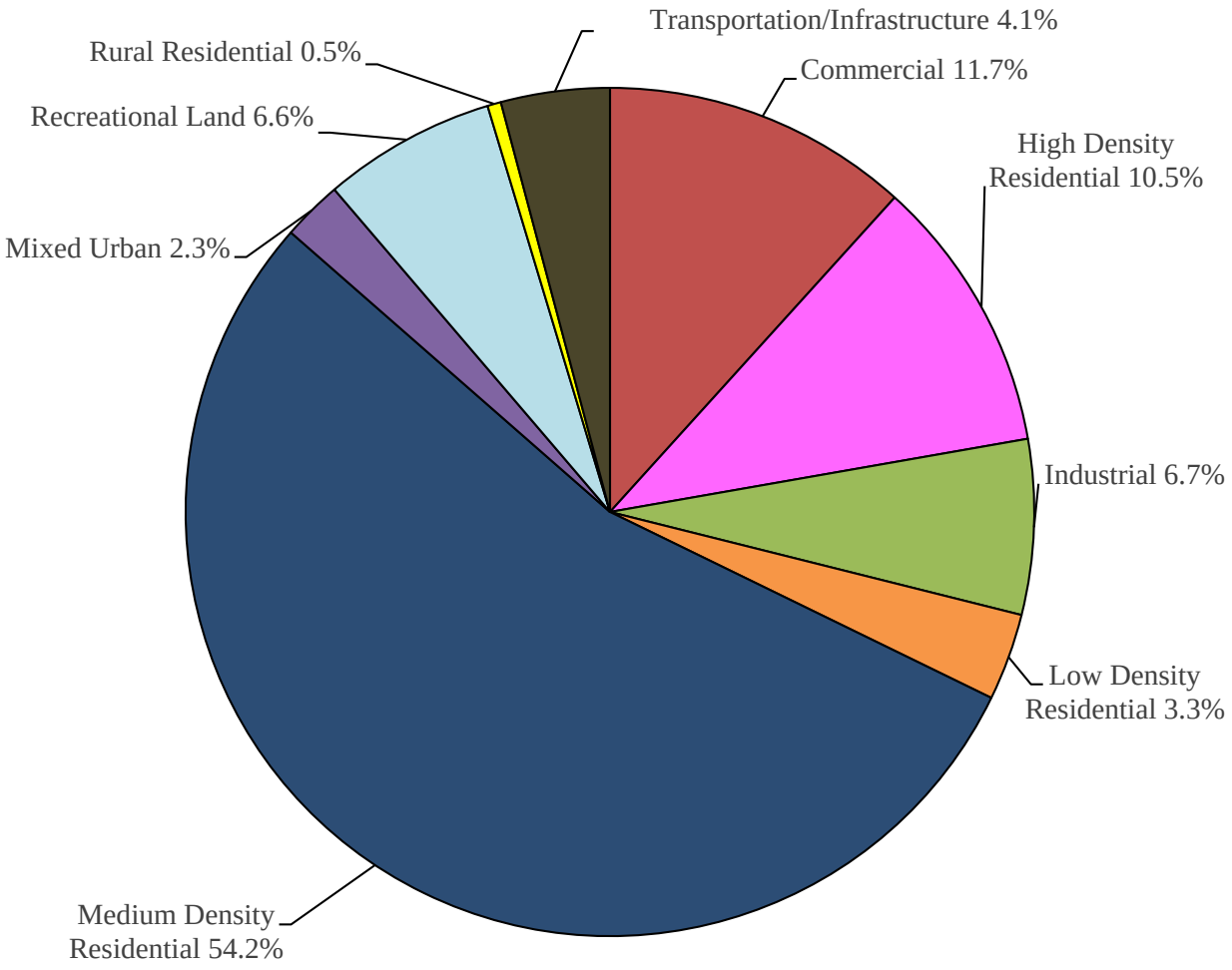


Figure 3: Pie chart illustrating the various types of urban land use in Metuchen Borough

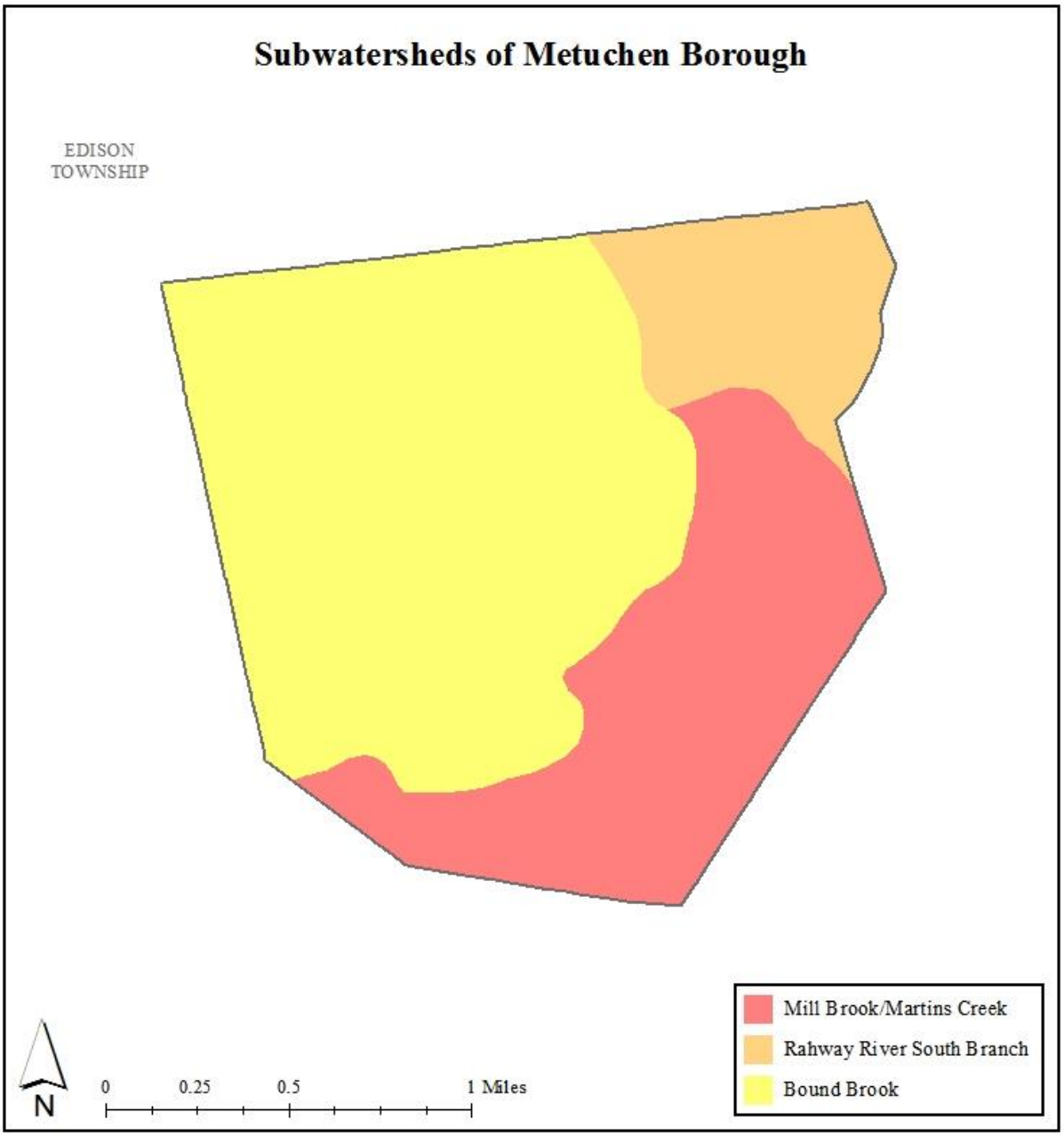


Figure 4: Map of the subwatersheds in Metuchen Borough

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 Metuchen Borough 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 Metuchen Borough. Each practice is discussed below.

Disconnected downspouts

This is often referred to as simple disconnection. A downspout is simply disconnected, and 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

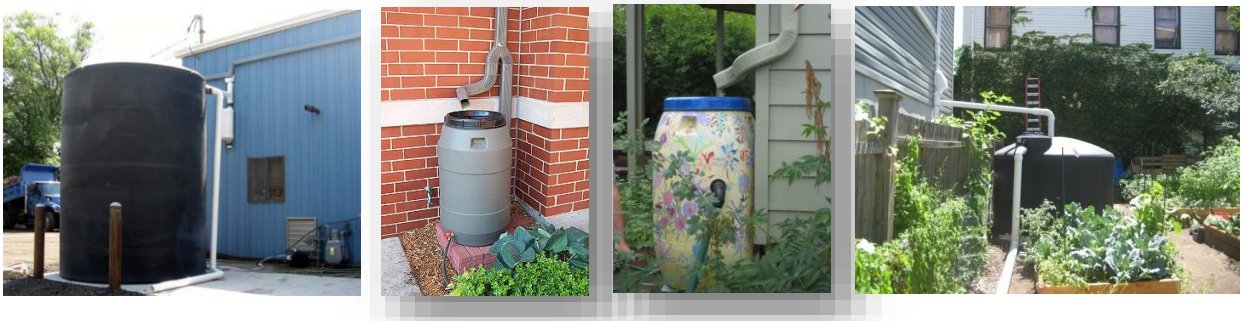
These are landscaped features that are designed to capture, treat, and infiltrate stormwater runoff. These systems can easily be incorporated into existing landscapes, improving aesthetics and creating a wildlife habitat while managing stormwater runoff. Bioretention systems also can be used in soils 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*.

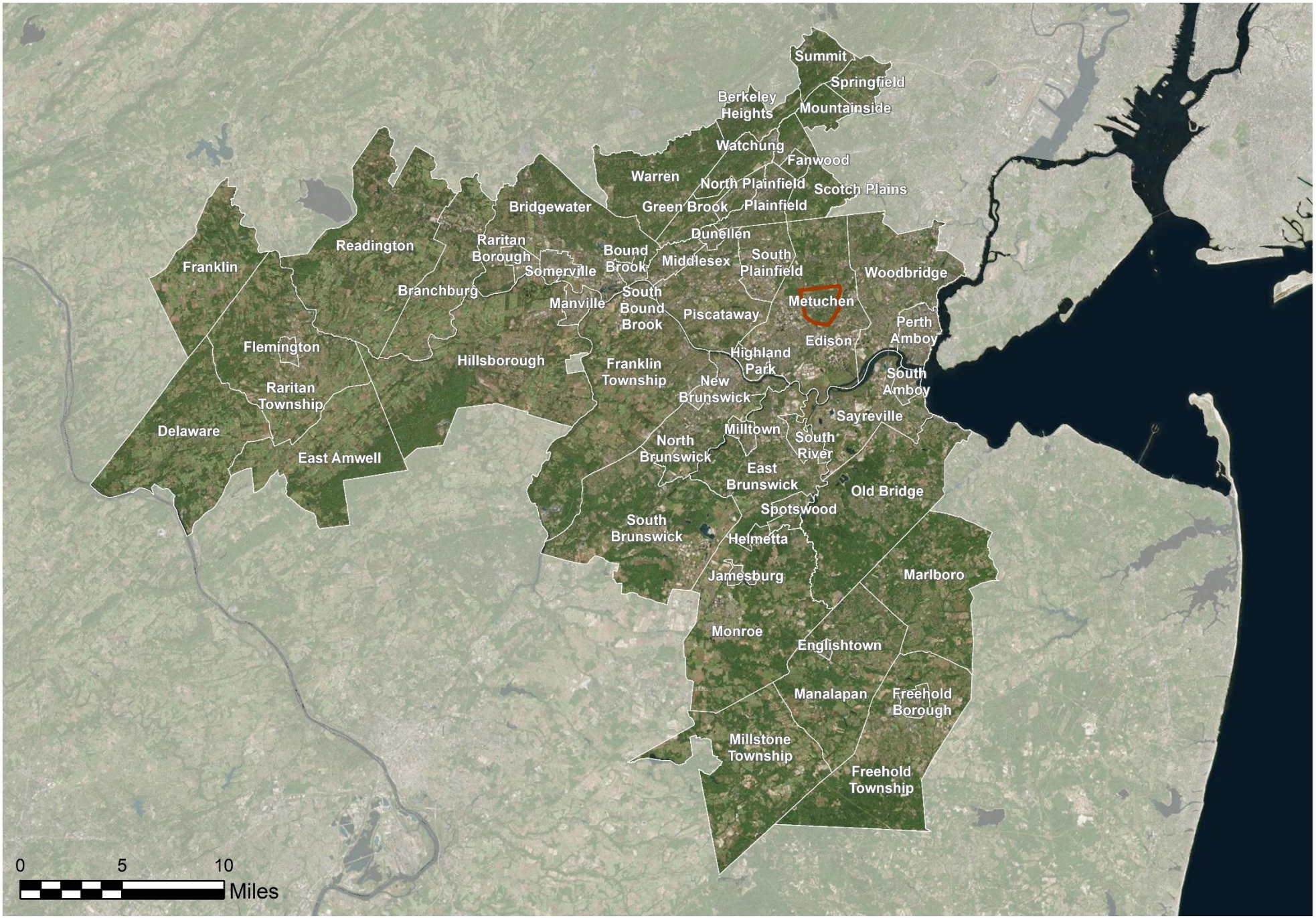
Conclusion

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.

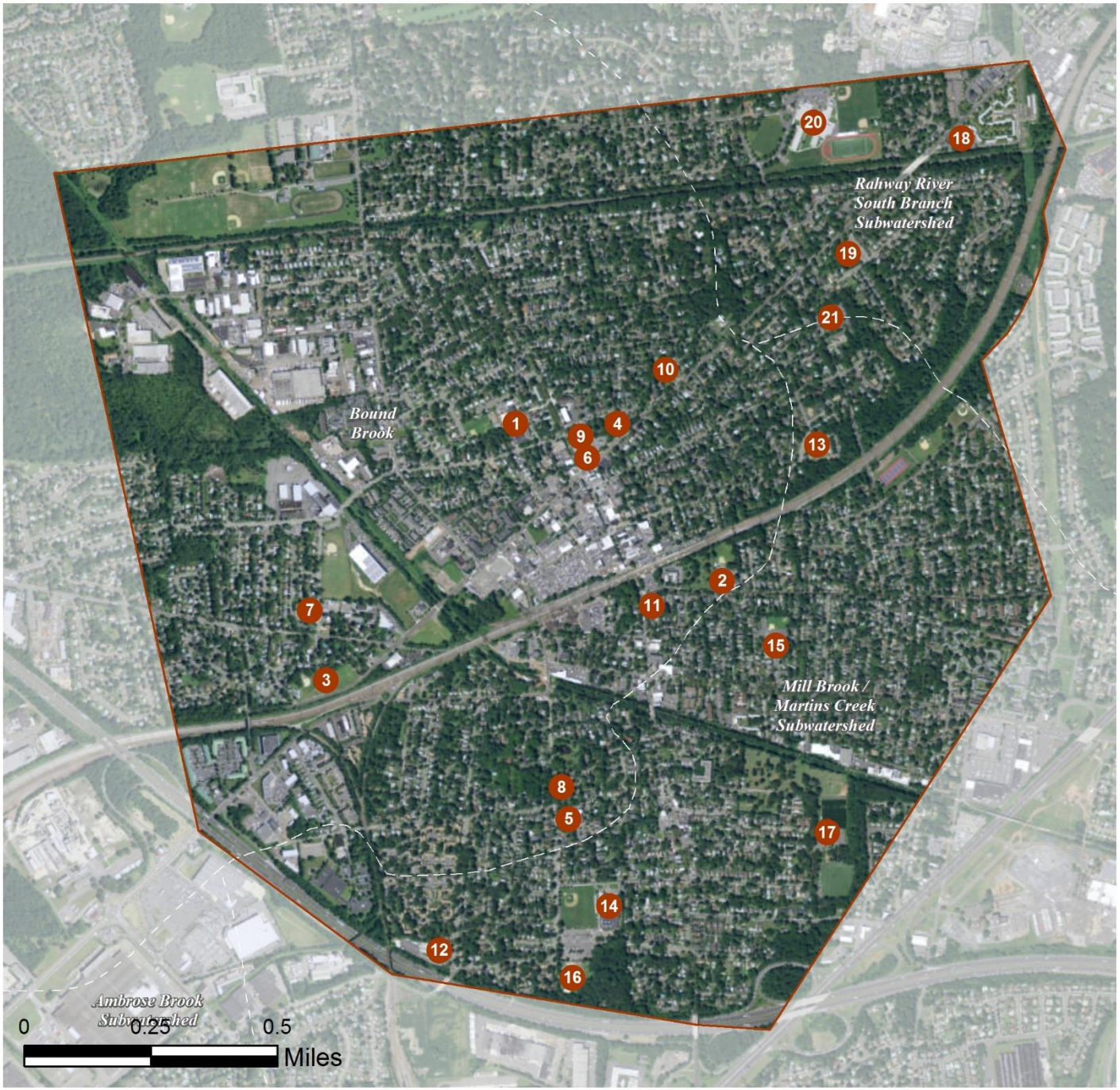
a. Overview Map of the Project

METUCHEN BOROUGH: CLIMATE RESILIENT GREEN INFRASTRUCTURE FOR THE RARITAN BASIN



b. Green Infrastructure Sites

METUCHEN BOROUGH: GREEN INFRASTRUCTURE SITES



SITES WITHIN THE BOUND BROOK SUBWATERSHED:

1. Campbell Elementary School
2. First Presbyterian Church
3. Hampton Park
4. Metuchen Borough Public Library
5. Metuchen Borough YMCA
6. Metuchen Municipal Court
7. New Hope Baptist Church
8. Reformed Church of Metuchen
9. Saint Francis CYO
10. Saint Luke's Episcopal Church
11. US Post Office

SITES WITHIN THE MILL BROOK / MARTINS CREEK SUBWATERSHED:

12. Assembly of God & Christian Academy
13. Centenary Church
14. Edgar Middle School
15. Mildred B. Moss Elementary School
16. Municipal Pool
17. Myrtle Charles Park

SITES WITHIN THE RAHWAY RIVER SOUTH BRANCH SUBWATERSHED:

18. Elks Lodge
19. Metuchen First Baptist Church
20. Metuchen High School
21. Neve Shalom Synagogue

c. Proposed Green Infrastructure Concepts

CAMPBELL ELEMENTARY SCHOOL

Subwatershed: **Bound Brook**

Site Area: **216,120 sq. ft.**

Address: **24 Durham Avenue**
Metuchen, NJ 08840

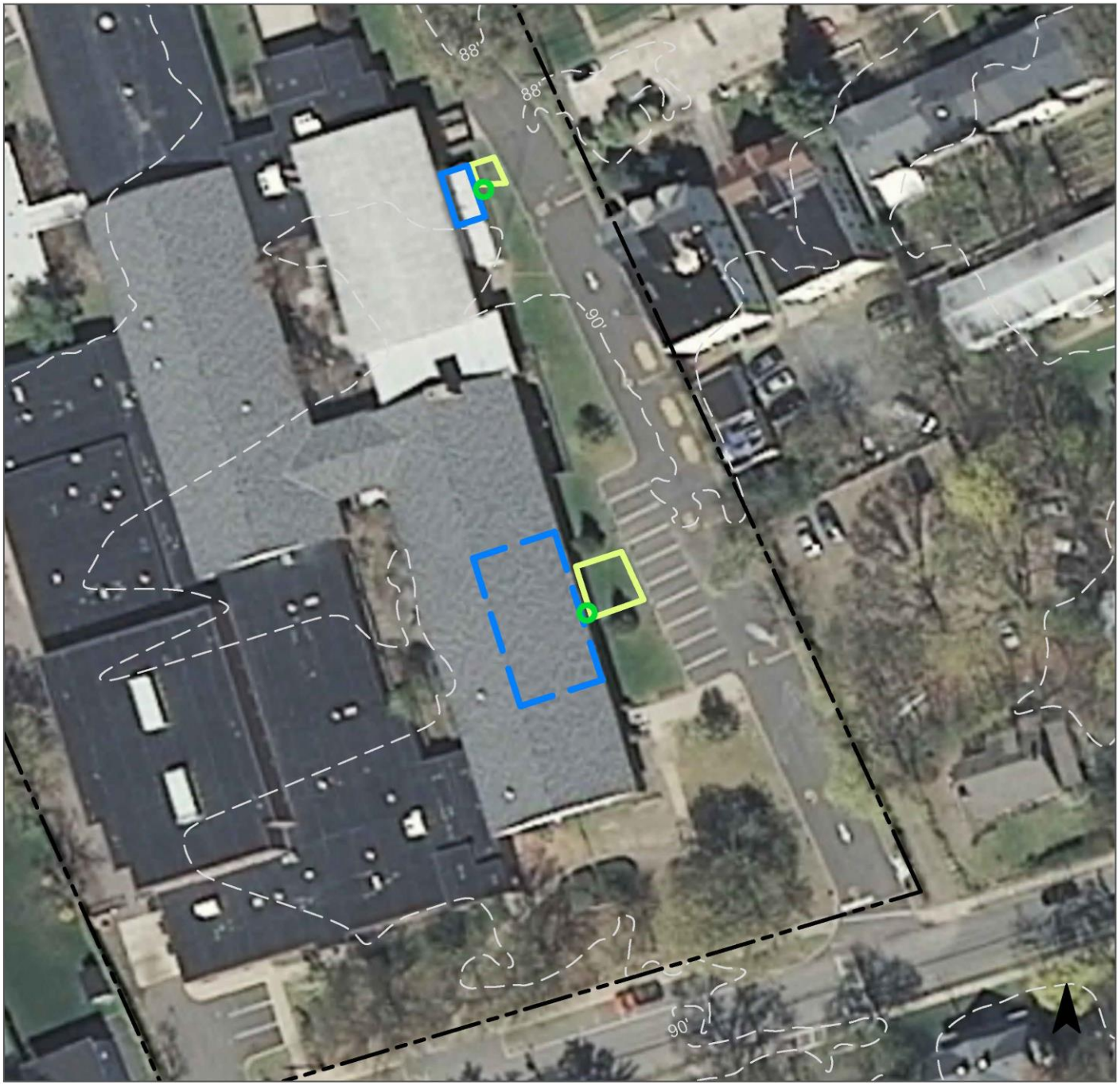
Block and Lot: **Block 60, Lot 56**

On the east side of the school, two rain gardens can be installed to capture, treat, and infiltrate roof runoff by disconnecting and redirecting adjacent downspouts. 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"
69	148,129	7.1	74.8	680.1	0.115	4.06

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	0.060	8	4,376	0.16	513	$2,565

GREEN INFRASTRUCTURE RECOMMENDATIONS



Campbell Elementary

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

0 30' 60'

FIRST PRESBYTERIAN CHURCH

Subwatershed: **Bound Brook**

Site Area: **127,572 sq. ft.**

Address: **270 Woodbridge Avenue**
Metuchen, NJ 08840

Block and Lot: **Block 164, Lot 49**

All of the church's downspouts are directly connected. A rain garden can capture, treat and infiltrate driveway runoff. Parking spaces can be replaced with porous asphalt to infiltrate parking lot 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	52,129	2.5	26.3	239.3	0.041	1.43

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	0.046	6	3,344	0.13	567	$2,835
Pervious pavements	0.544	77	39,921	1.50	3,949	$98,725

GREEN INFRASTRUCTURE RECOMMENDATIONS

First Presbyterian Church

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

0 30' 60'

HAMPTON PARK

Subwatershed: **Bound Brook**

Site Area: **155,385 sq. ft.**

Address: **20 Hampton Street**
Metuchen, NJ 08840

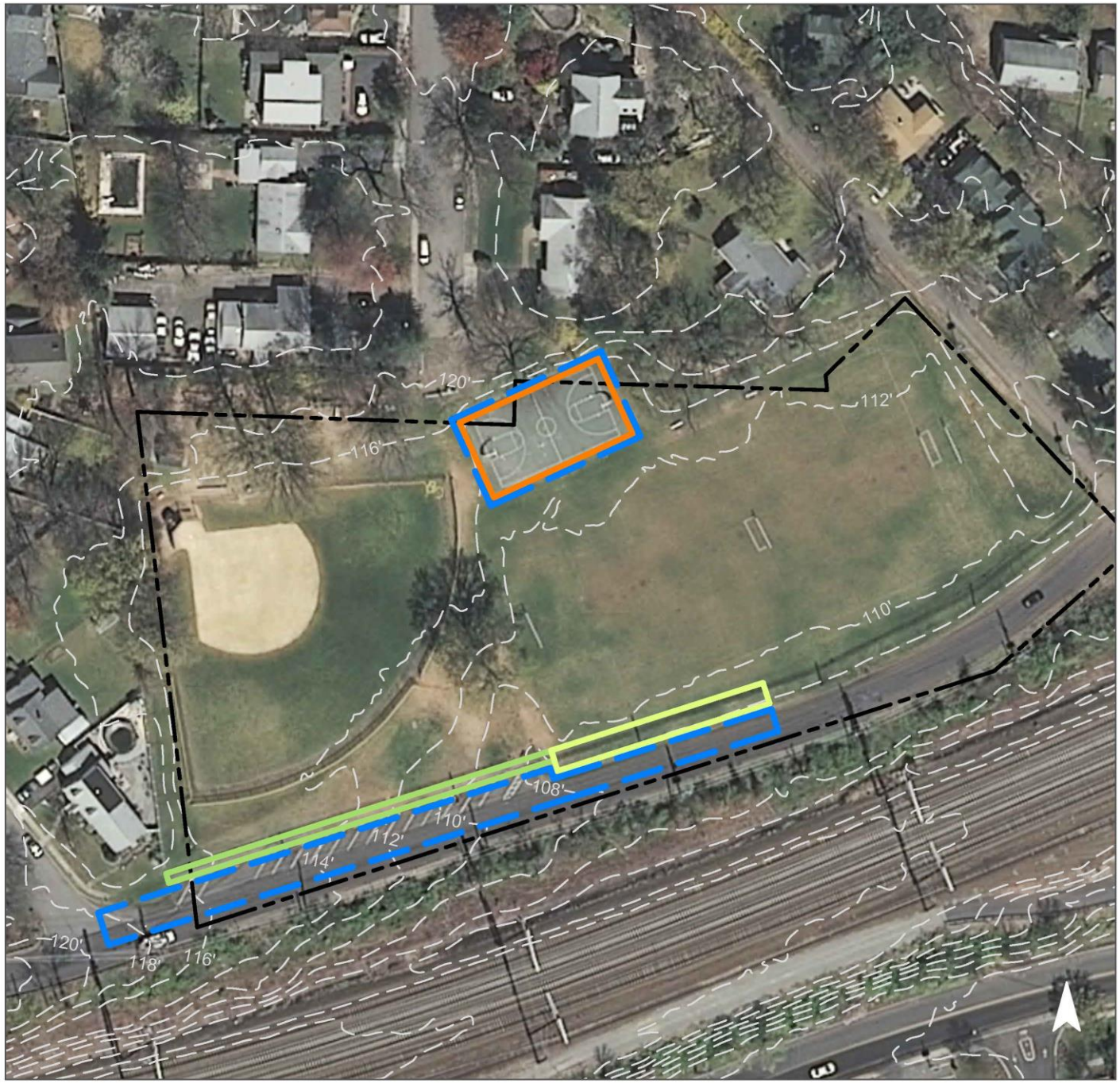
Block and Lot: **Block 79, Lot 25.01**

Hampton Park has a basketball court that can be repaved with pervious pavement to infiltrate stormwater. A bioswale and bioretention system can be installed adjacent to the parking area to 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"
16	24,389	1.2	12.3	112.0	0.019	0.67

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	0.130	18	9,530	0.36	2,072	$10,360
Bioswales	0.109	15	7,974	0.30	1,734	$8,670
Pervious pavements	0.174	25	12,783	0.48	6,650	$166,250

GREEN INFRASTRUCTURE RECOMMENDATIONS



Hampton Park

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

0 50' 100'

METUCHEN BOROUGH PUBLIC LIBRARY

Subwatershed: **Bound Brook**

Site Area: **41,956 sq. ft.**

Address: **480 Middlesex Avenue**
Metuchen, NJ 08840

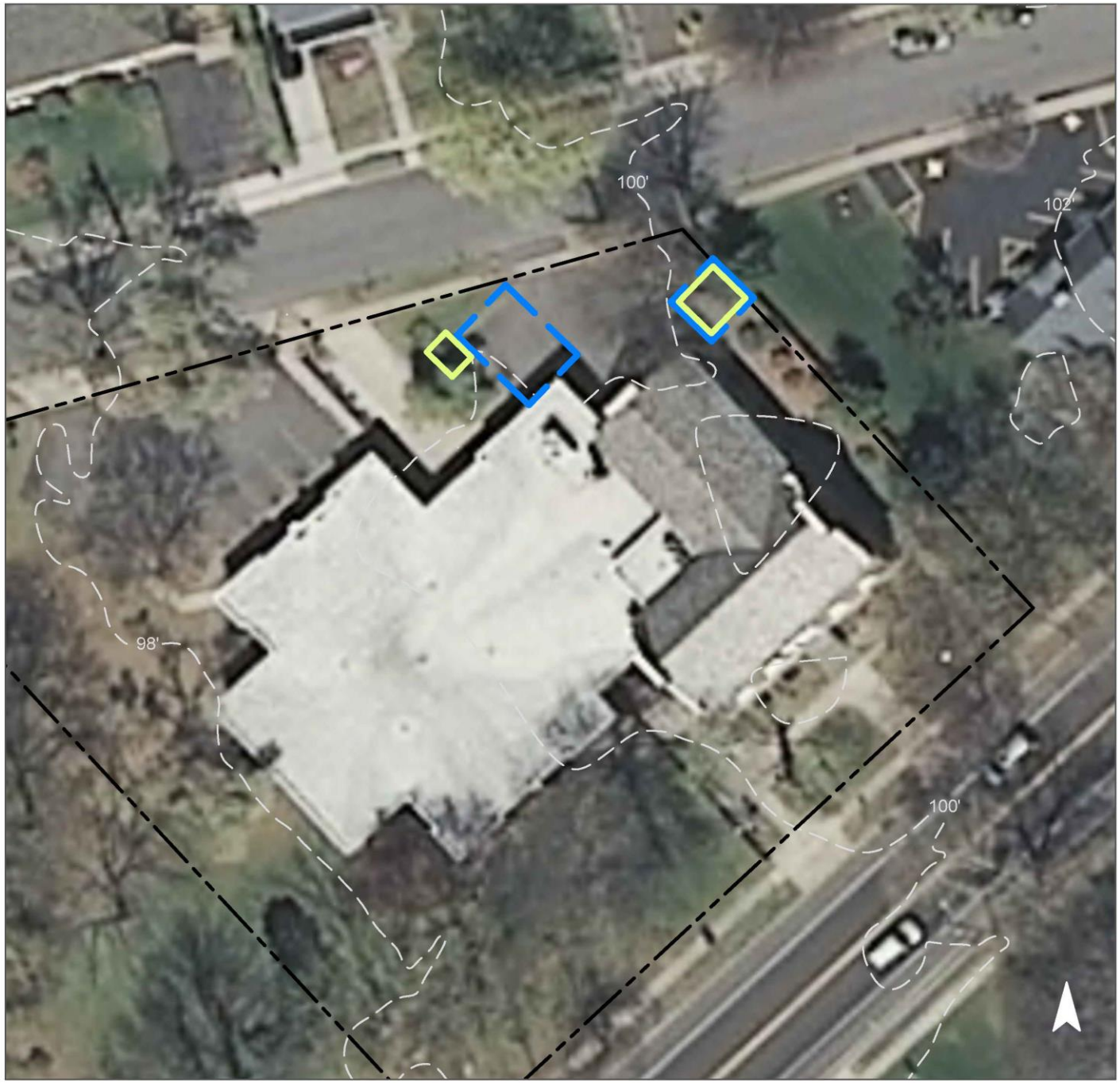
Block and Lot: **Block 102, Lot 2**

The parking lot is in poor condition and is ponding in two corners. The corner on the east side can be depaved to install a rain garden to capture, treat and infiltrate parking lot runoff. A second rain garden can be installed in the turf grass area on the northwest side of the lot, and curb cuts can be made to allow stormwater to flow into the garden. 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"
75	31,482	1.5	15.9	144.5	0.025	0.86

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	0.019	3	1,376	0.05	246	$1,230

GREEN INFRASTRUCTURE RECOMMENDATIONS



Municipal Borough Public Library

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

0 20' 40'

METUCHEN BOROUGH YMCA

Subwatershed: Bound Brook

Site Area: 55,576 sq. ft.

Address: 65 High Street
Metuchen, NJ 08840

Block and Lot: Block 157, Lot 57.01

The YMCA has several disconnected downspouts leading out to the turf grass area north of the building. This area can be turned into a rain garden to capture, treat, and infiltrate the roof runoff. A cistern can be set up on the eastern side of the building to harvest rainwater for the existing community garden. Parking spaces can also be converted into pervious pavement to infiltrate parking lot run off. 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	37,700	1.8	19.0	173.1	0.048	1.68

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
Bioretention systems	0.101	14	7,413	0.28	980	$4,900
Pervious pavements	0.508	72	37,250	1.40	3,516	$87,900
Rainwater harvesting systems	0.007	1	250	0.02	250 (gal)	$499

GREEN INFRASTRUCTURE RECOMMENDATIONS

Metuchen YMCA

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

0 30' 60'

METUCHEN MUNICIPAL COURT

Subwatershed: **Bound Brook**

Site Area: **62,364 sq. ft.**

Address: **500 Main Street**
Metuchen, NJ 08840

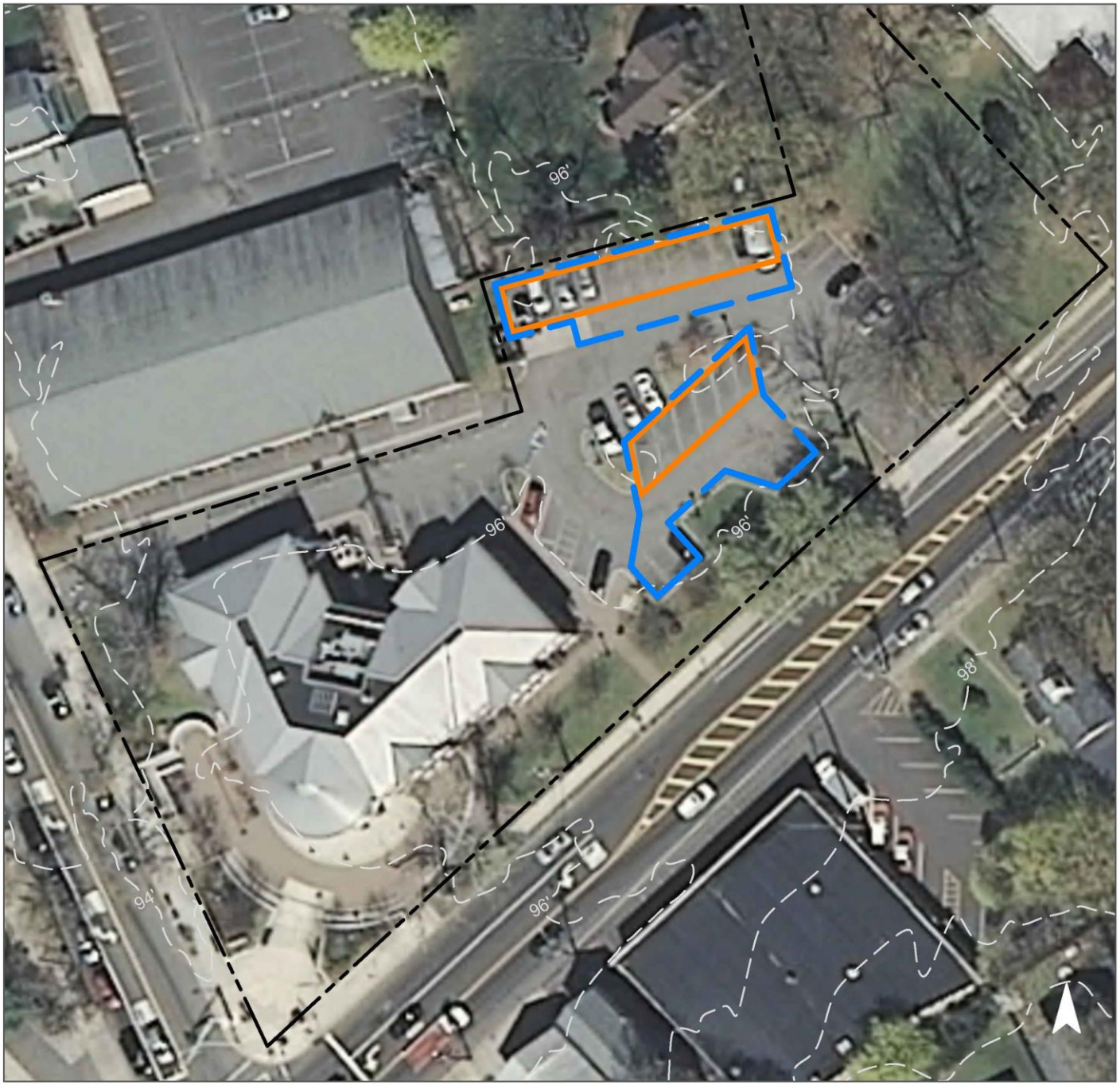
Block and Lot: **Block 102, Lot 25**

The Municipal Court parking lot has an area where ponding occurs. In addition to installing a rain garden in the neighboring property of Saint Francis CYO, this ponding can be mediated by installing pervious pavement in parking spaces. 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"
75	46,773	2.3	23.6	214.8	0.036	1.28

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	0.172	24	12,634	0.47	3,067	$15,335

GREEN INFRASTRUCTURE RECOMMENDATIONS



Metuchen Municipal Court

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

0 30' 60'

NEW HOPE BAPTIST CHURCH

Subwatershed: **Bound Brook**

Site Area: **47,820 sq. ft.**

Address: **45 Hampton Street**
Metuchen, NJ 08840

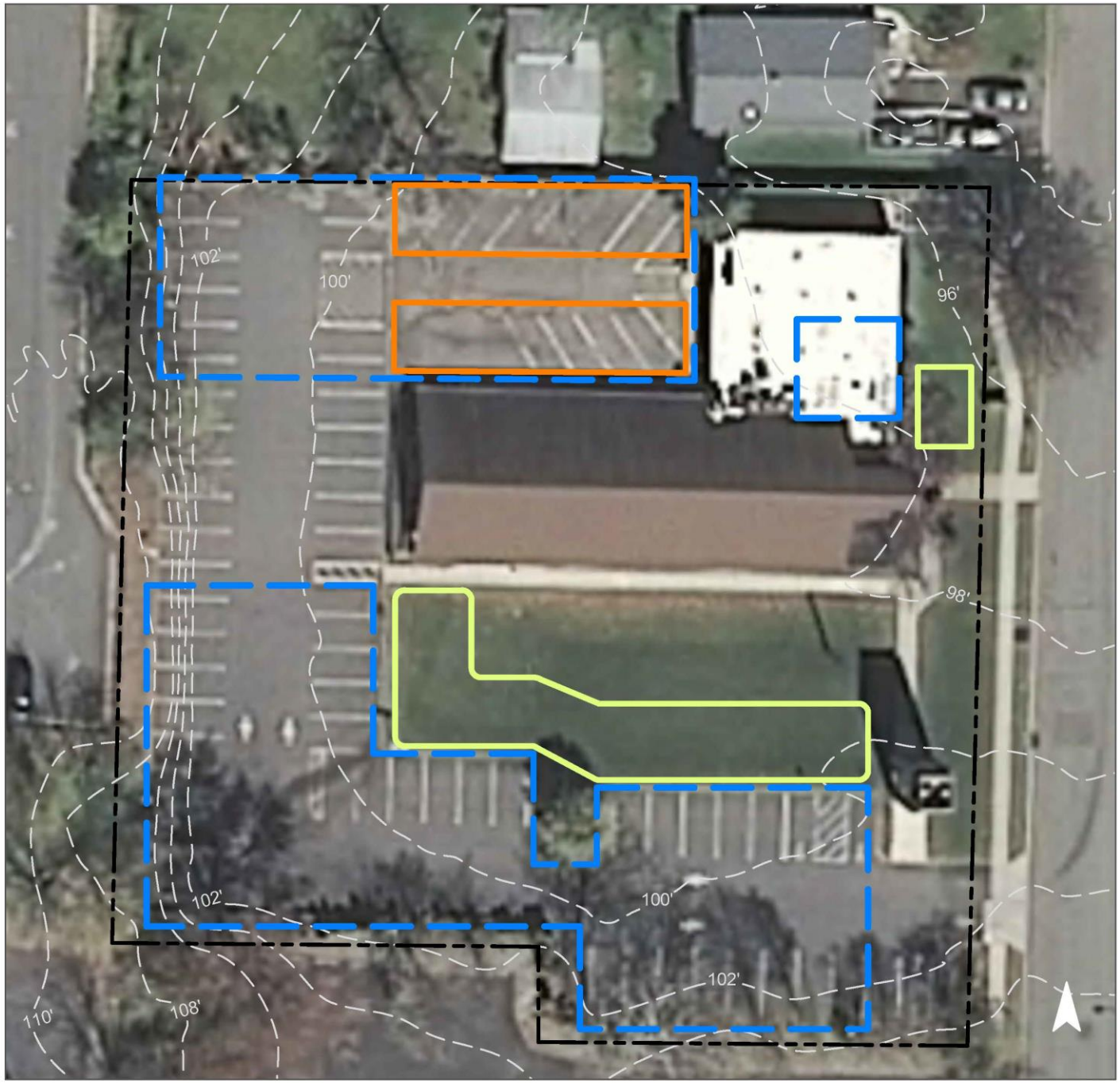
Block and Lot: **Block 68, Lot 12**

This church has severe damage to it's northern parking lot near the building. This area can be replaced with pervious pavement to infiltrate parking lot runoff. Bioretention systems can also be installed to capture, treat, and infiltrate additional parking lot runoff as well as 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"
55	26,301	1.3	13.3	120.8	0.014	0.51

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	0.334	47	24,490	0.92	3,138	$15,690
Pervious pavements	0.192	27	14,107	0.53	2,756	$68,900

GREEN INFRASTRUCTURE RECOMMENDATIONS



New Hope Baptist Chuch

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

0 20' 40'

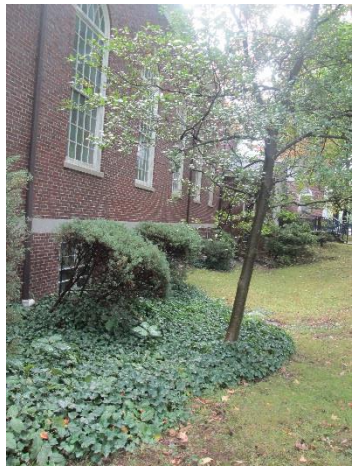
REFORMED CHURCH OF METUCHEN

Subwatershed: **Bound Brook**

Site Area: **37,117 sq. ft.**

Address: **270 Woodbridge Avenue**
Metuchen, NJ 08840

Block and Lot: **Block 150, Lot 30**

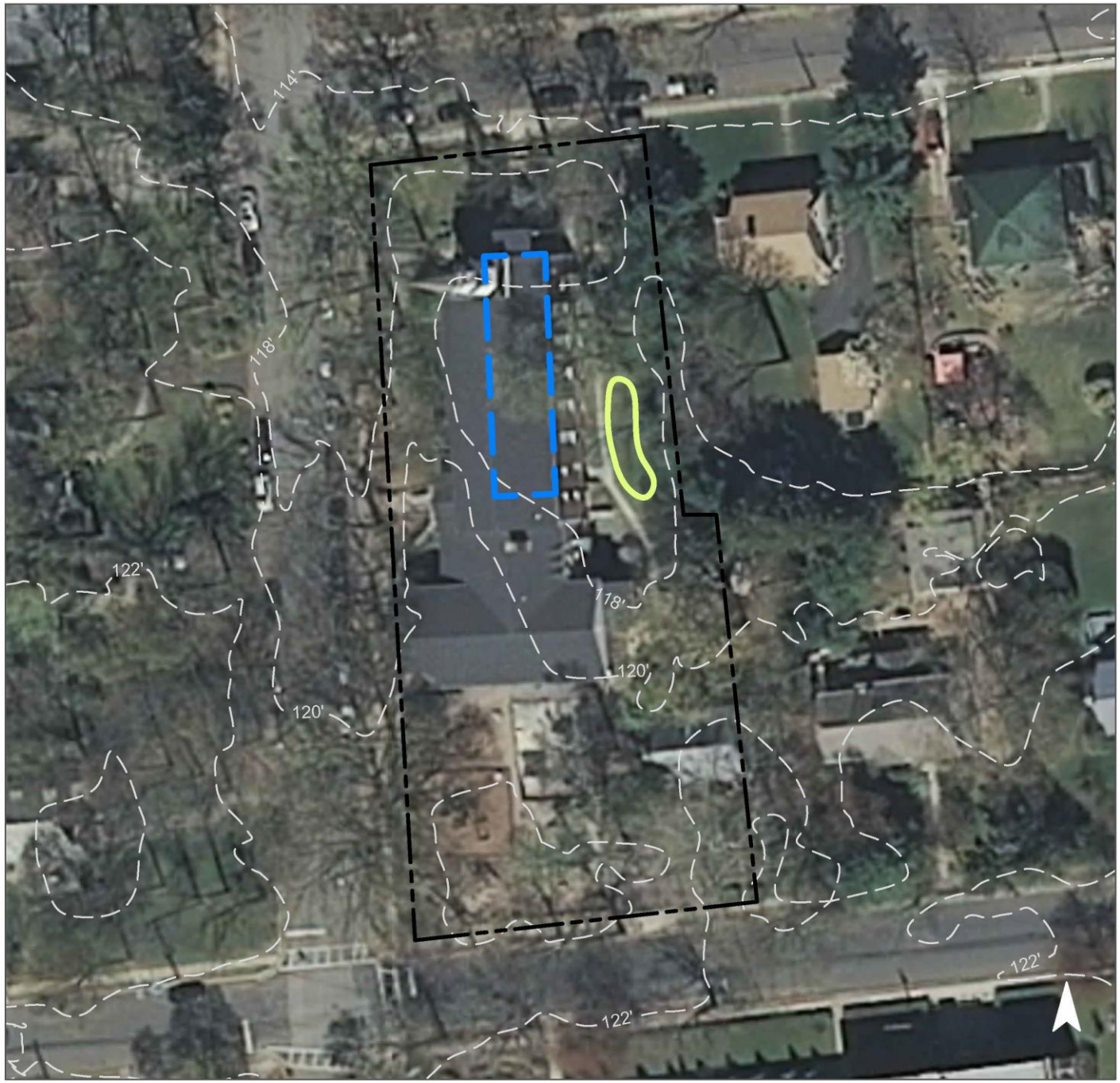


A rain garden can be constructed to capture, treat, and infiltrate runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

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"
75	27,835	1.3	14.1	127.8	0.022	0.76

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	0.062	9	4,533	0.17	630	$3,150

GREEN INFRASTRUCTURE RECOMMENDATIONS



Reformed Church of Metuchen

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

0 30' 60'

SAINT FRANCIS CYO

Subwatershed: **Bound Brook**

Site Area: **44,844 sq. ft.**

Address: **521 Main Street**
Metuchen, NJ 08840

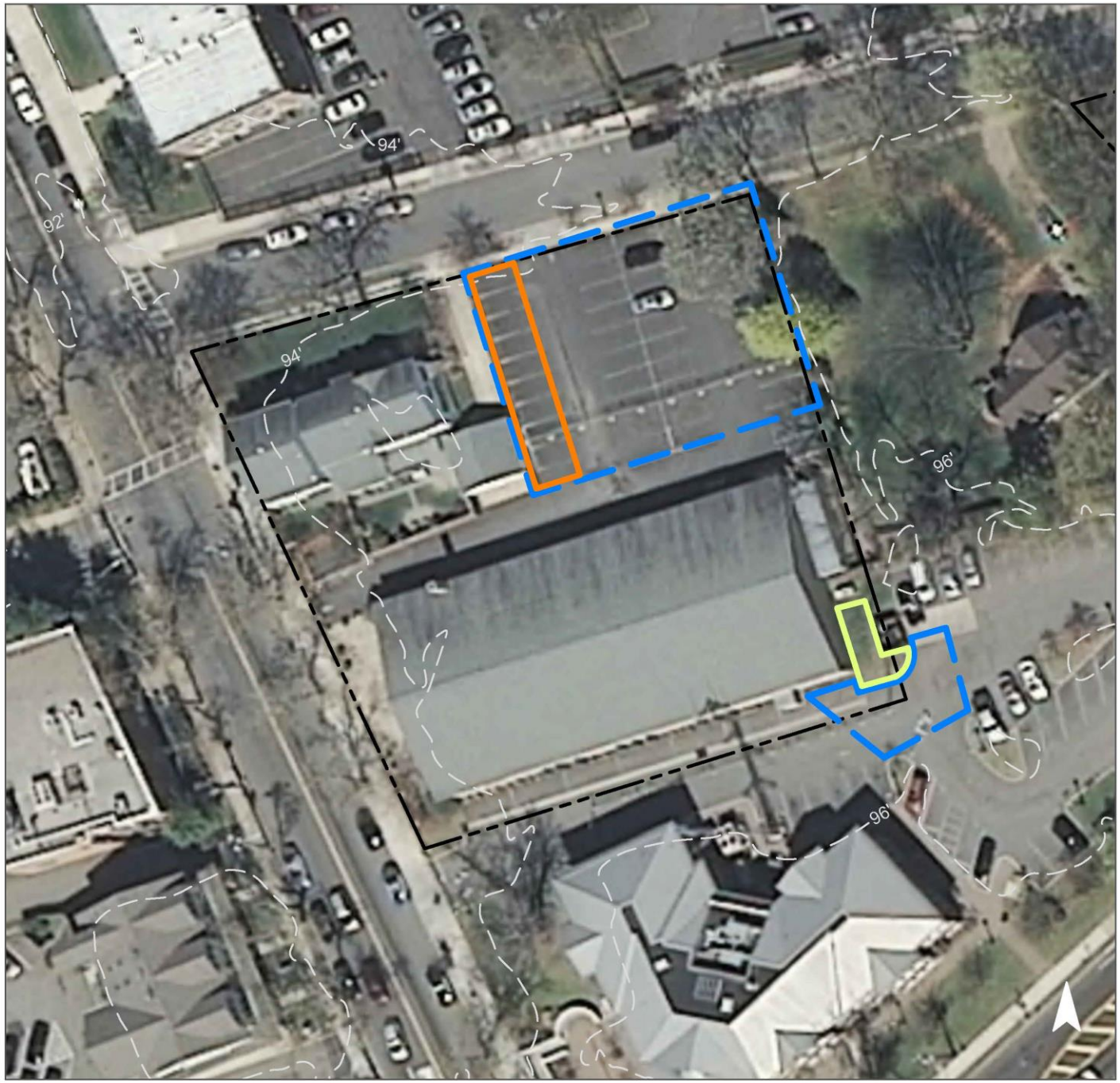
Block and Lot: **Block 102, Lot 37**

Parking spaces can be repaved with porous asphalt to infiltrate parking lot runoff. A bioretention system can also be installed in the turf grass area off of the southeast corner of the CYO building, where water currently pools. This rain garden could also infiltrate runoff from the adjacent Metuchen Municipal Court. 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"
75	33,632	1.6	17.0	154.4	0.026	0.92

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	5	2,745	0.10	441	$2,205
Pervious pavements	0.282	40	20,690	0.78	1,574	$39,350

GREEN INFRASTRUCTURE RECOMMENDATIONS



Saint Francis CYO

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

0 30' 60'

SAINT LUKE'S EPISCOPAL CHURCH

Subwatershed: **Bound Brook**

Site Area: **76,414 sq. ft.**

Address: **17 Oak Avenue**
Metuchen, NJ 08840

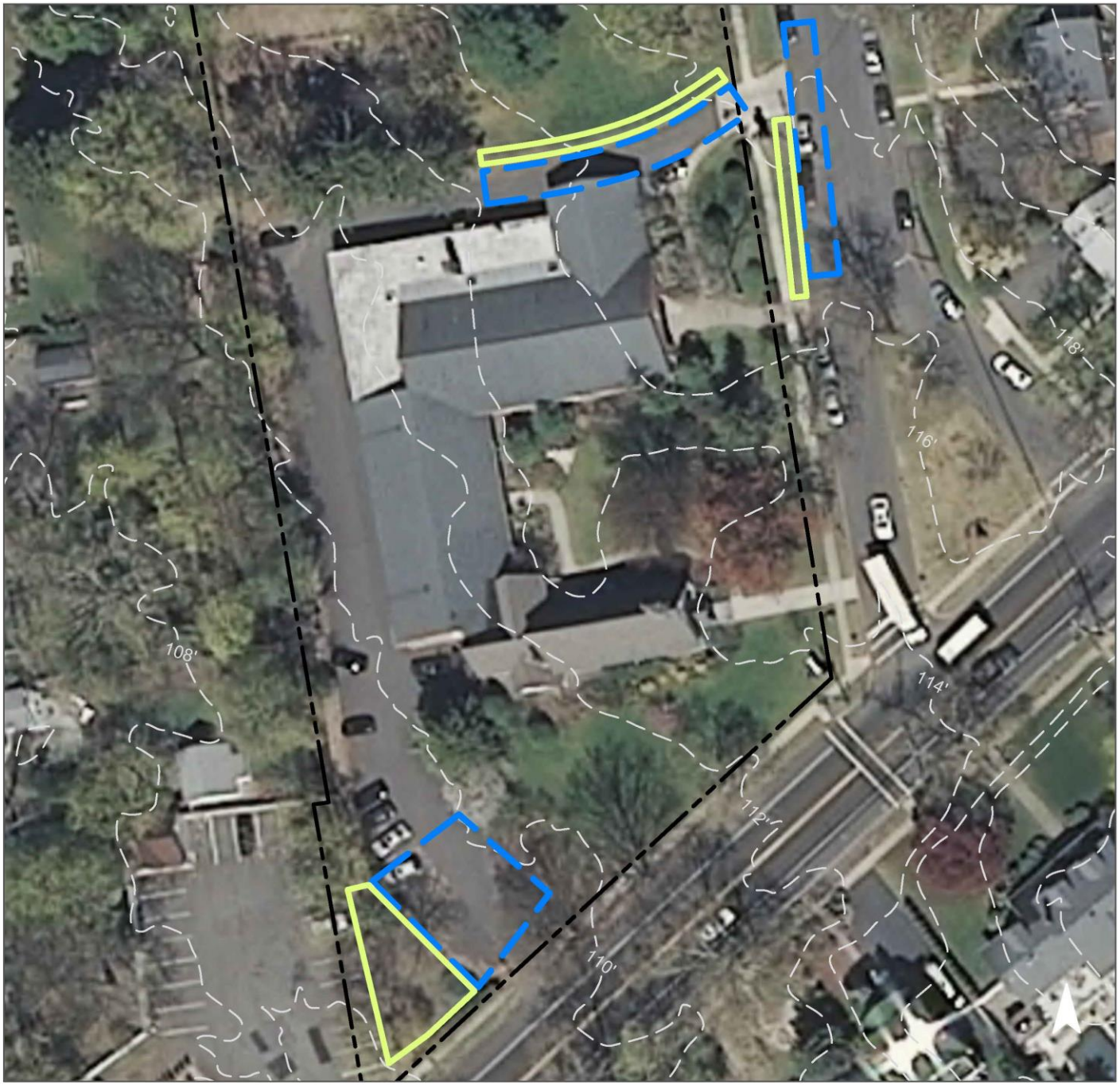
Block and Lot: **Block 104, Lot 8**

This site has several connected downspouts, as well as downspouts that are disconnected onto the parking lot. Parking lot and road runoff can be captured, treated and infiltrated with rain gardens. 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"
66	50,253	2.4	25.4	230.7	0.039	1.38

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	0.128	18	9,357	0.35	2,513	$12,565

GREEN INFRASTRUCTURE RECOMMENDATIONS



Saint Luke's Episcopal Church

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

0 30' 60'

US POST OFFICE

Subwatershed: **Bound Brook**

Site Area: **27,895 sq. ft.**

Address: **360 Main Street**
Metuchen, NJ 08840

Block and Lot: **Block 182, Lot 33**

The Post Office parking lot is in poor condition and ponding occurs after rain events. Parking spaces can be replaced with pervious pavement to reduce impervious cover and promote infiltration. The concrete flow channel near the employee driveway can also be replaced with a bioswale to remove pollutants and allow stormwater to infiltrate. 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"
73	20,247	1.0	10.2	93.0	0.016	0.56

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	0.081	11	5,947	0.22	568	$2,840
Pervious pavements	0.115	16	8,460	0.32	1,935	$48,375

GREEN INFRASTRUCTURE RECOMMENDATIONS

US Post Office

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

0 20' 40'

ASSEMBLY OF GOD AND CHRISTIAN ACADEMY

Subwatershed: Mills Brook/Martins Creek

Site Area: 110,082 sq. ft.

Address: 130 Whittman Avenue
Metuchen, NJ 08840

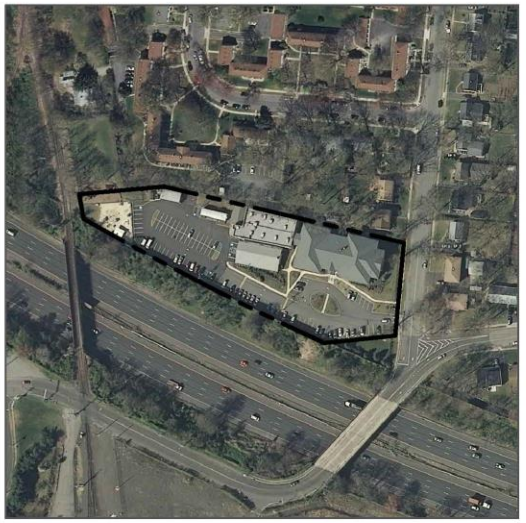
Block and Lot: Block 156, Lot 10

The church has several connected downspouts. On the east side of the church, downspouts can be disconnected into a rain garden, which can capture, treat, and infiltrate stormwater. Parking spaces can also be replaced with porous asphalt to infiltrate additional 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"
71	77,626	3.7	39.2	356.4	0.060	2.13

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	0.052	9	3,785	0.14	545	$2,725
Pervious pavements	0.955	135	70,080	2.63	9,226	$230,650

GREEN INFRASTRUCTURE RECOMMENDATIONS



Assembly of God & Christian Academy

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

0 50' 100'

CENTENARY CHURCH

Subwatershed: **Mill Brook / Martins Creek**

Site Area: **292,791 sq. ft.**

Address: **200 Hillside Avenue**
Metuchen, NJ 08840

Block and Lot: **Block 124.02, Lot 54**

This site has several connected downspouts. A rain garden can capture, treat, and infiltrate roof runoff in the northeast lawn area. 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"
24	70,078	3.4	35.4	321.8	0.055	1.92

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	2,708	0.10	1,045	$5,225

GREEN INFRASTRUCTURE RECOMMENDATIONS

Centenary Church

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

0 30' 60'

EDGAR MIDDLE SCHOOL

Subwatershed: **Mill Brook / Martins Creek**

Site Area: **333,215 sq. ft.**

Address: **49 Brunswick Avenue**
Metuchen, NJ 08840

Block and Lot: **Block 160, Lot 61**

Several areas have ponding water around the site. Bioretention systems can be installed in these areas 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"
40	133,939	6.5	67.6	615.0	0.104	3.67

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	0.365	61	26,778	1.01	3,557	$17,785

GREEN INFRASTRUCTURE RECOMMENDATIONS

Edgar Middle School

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

0 50' 100'

MILDRED B. MOSS ELEMENTARY SCHOOL

Subwatershed: **Mill Brook / Martins Creek**

Site Area: **132,159 sq. ft.**

Address: **16 Simpson Place**
Metuchen, NJ 08840

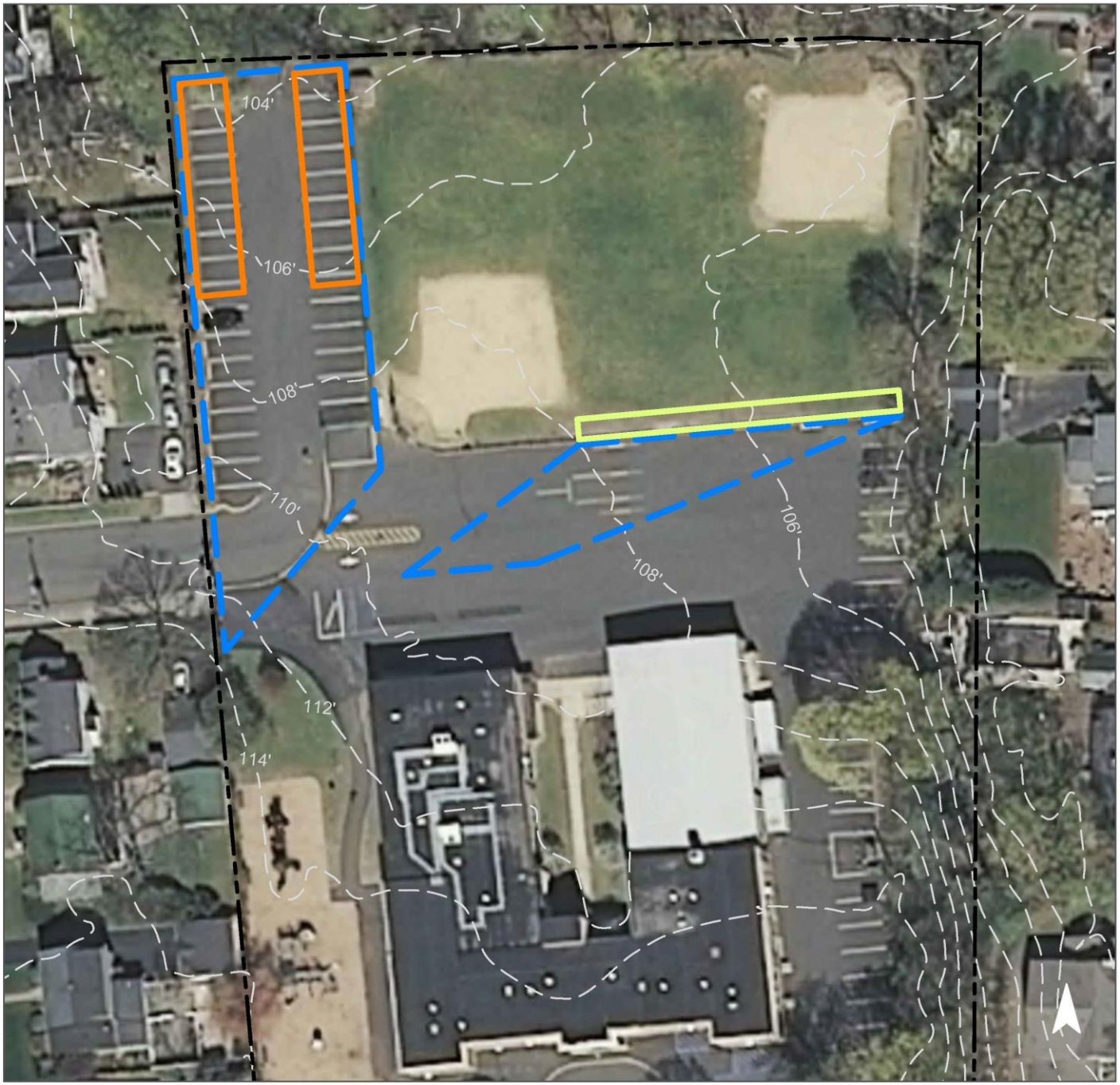
Block and Lot: **Block 185, Lot 69**

Drainage issues include water seeping into the basement and areas that pond after rain events. Parking spaces in the northwest section of the parking lot can be replaced with porous pavement to allow runoff to infiltrate. A rain garden can also be installed to capture, treat and infiltrate additional 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"
65	85,764	4.1	43.3	393.8	0.067	2.35

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	0.104	17	7,667	0.29	1,013	$5,065
Pervious pavements	0.337	48	24,751	0.93	3,015	$75,375

GREEN INFRASTRUCTURE RECOMMENDATIONS



Mildred B. Moss Elementary School

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

0 30' 60'

MUNICIPAL POOL

Subwatershed: **Mill Brook / Martins Creek**

Site Area: **491,524 sq. ft.**

Address: **50 Lake Avenue**
Metuchen, NJ 08840

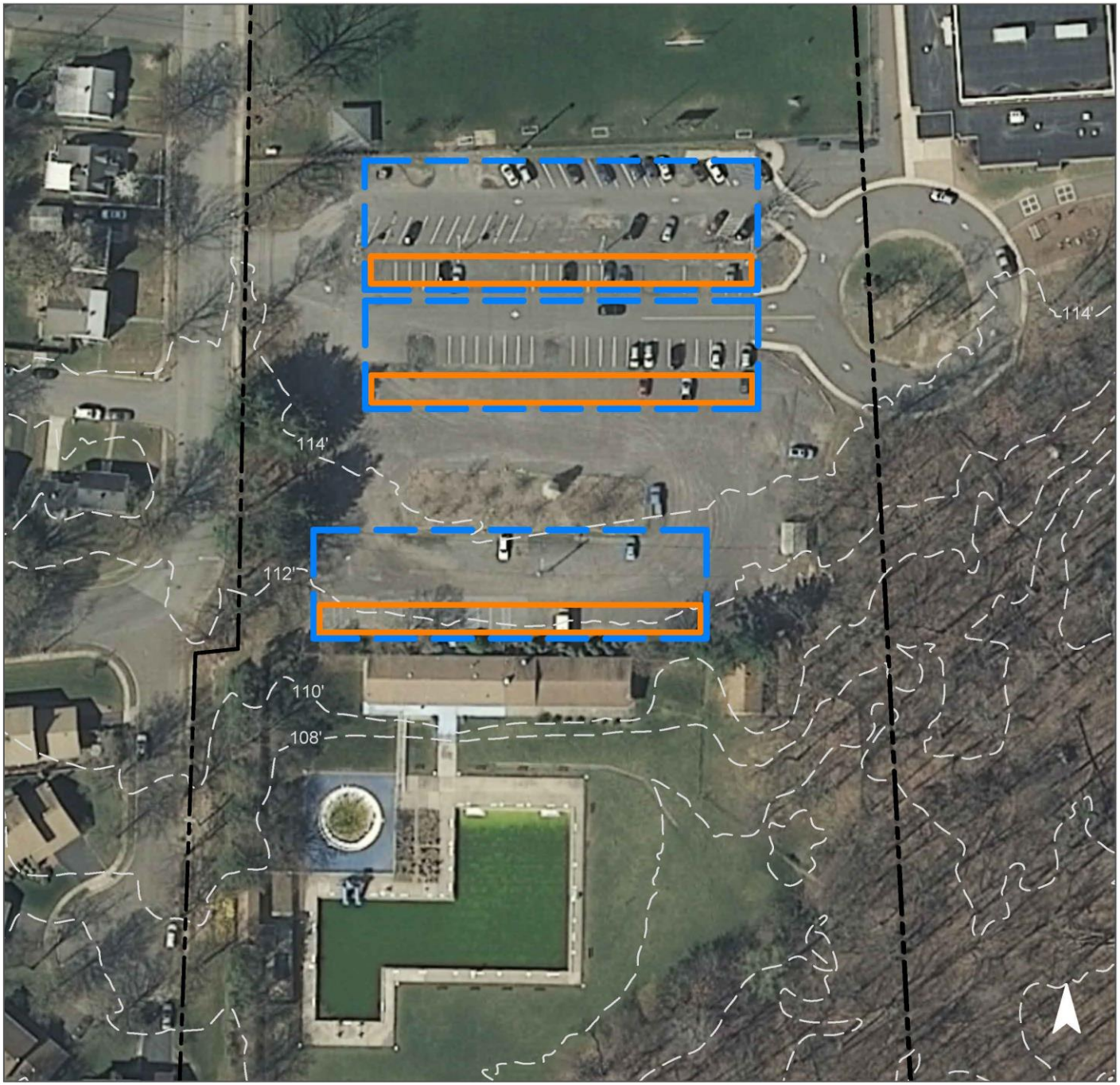
Block and Lot: **Block 155, Lot 1**

The parking lot is in poor condition. Rows of parking spaces can be replaced using pervious pavement to promote infiltration. 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"
36	179,302	8.6	90.6	823.2	0.140	4.92

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	1.411	199	103,523	3.89	13,463	$336,575

GREEN INFRASTRUCTURE RECOMMENDATIONS



Municipal Pool

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

0 50' 100'

MYRTLE CHARLES PARK

Subwatershed: **Mill Brook / Martins Creek**

Site Area: **448,096 sq. ft.**

Address: **30 West Walnut Street**
Metuchen, NJ 08840

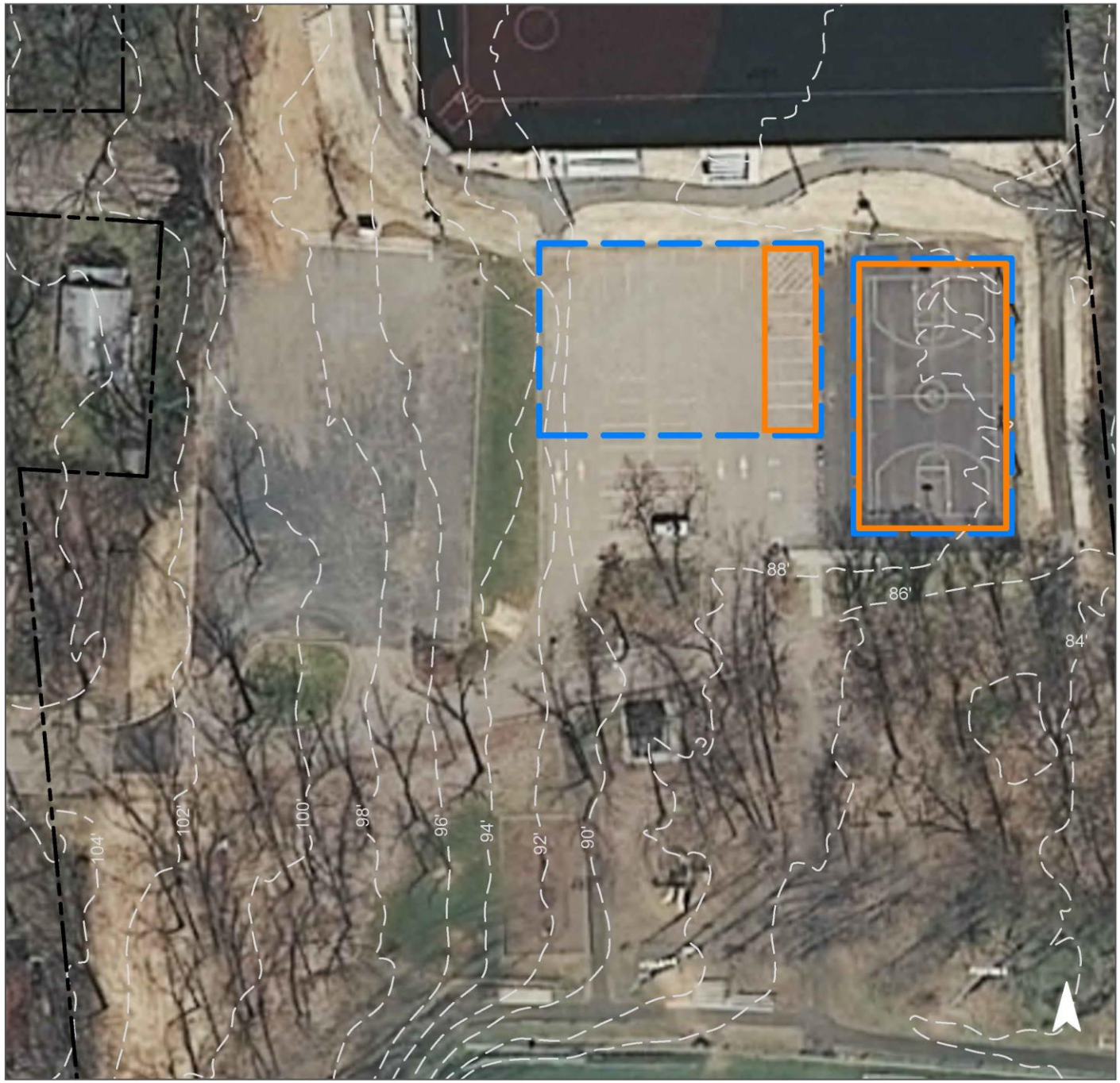
Block and Lot: **Block 213, Lot 1.01**

Parking spaces and play courts 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"
24	106,992	5.2	54.0	491.2	0.083	2.93

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	0.375	53	27,519	1.03	7,467	$186,675

GREEN INFRASTRUCTURE RECOMMENDATIONS



Myrtle Charles Park

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

0 30' 60'

ELKS LODGE

Subwatershed: Rahway River South Branch

Site Area: 40,913 sq. ft.

Address: 87 Middlesex Avenue
Metuchen, NJ 08840

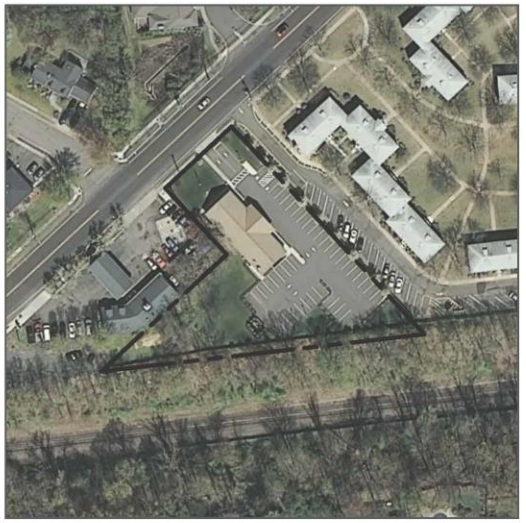
Block and Lot: Block 36, Lot 4

The Elks Lodge parking lot is in good condition. In the future, parking spaces can be converted into pervious pavement to infiltrate parking lot and roof runoff. A rain garden can also be installed to capture, treat, and infiltrate rooftop runoff by disconnecting and redirecting a downspout on the southwest side of the building. 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"
55	22,502	1.1	11.4	103.3	0.018	0.62

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	0.042	7	3,089	0.12	302	$1,510
Pervious pavements	0.393	66	28,820	1.08	3,755	$93,875

GREEN INFRASTRUCTURE RECOMMENDATIONS



Elks Lodge

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

0 30' 60'

METUCHEN FIRST BAPTIST CHURCH

Subwatershed: Rahway River South Branch

Site Area: 82,270 sq. ft.

Address: 225 Middlesex Avenue
Metuchen, NJ 08840

Block and Lot: Block 162.02, Lot 7

The church sits on a hill and runoff from the pathway and the downspouts is causing erosion and gullying. A bioretention system can be installed to help manage stormwater in this area. Rows of parking spaces can also be converted into pervious pavement to infiltrate parking lot 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"
70	57,210	2.8	28.9	262.7	0.045	1.57

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	0.035	6	2,581	0.10	398	$1,990
Pervious pavements	0.674	113	49,473	1.86	7,881	$197,025

GREEN INFRASTRUCTURE RECOMMENDATIONS

Metuchen First Baptist Church

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

0 30' 60'

METUCHEN HIGH SCHOOL

Subwatershed: Rahway River South Branch

Site Area: 1,060,921 sq. ft.

Address: 400 Grove Avenue Metuchen, NJ 08840

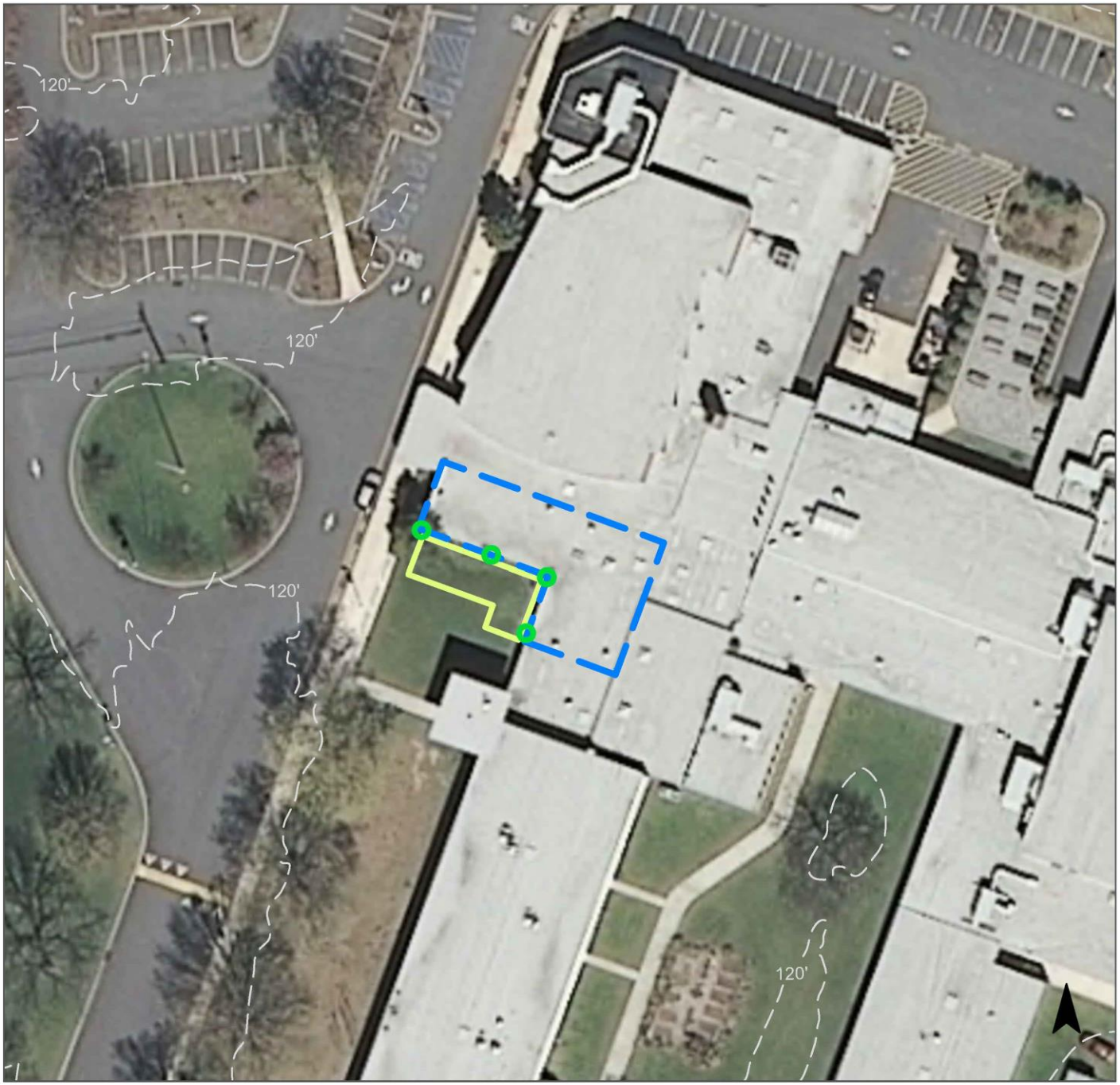
Block and Lot: Block 25.01, Lot 1

There are several downspouts that could be disconnected and redirected into a rain garden near the front of the school. This rain garden could 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"
37	387,783	18.7	195.8	1,780.5	0.302	10.64

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	0.094	16	6,926	0.26	915	$4,575

GREEN INFRASTRUCTURE RECOMMENDATIONS



Metuchen High School

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

0 30' 60'

NEVE SHALOM SYNAGOGUE

Subwatershed: Rahway River South Branch

Site Area: 158,017 sq. ft.

Address: 250 Grove Avenue
Metuchen, NJ 08840

Block and Lot: Block 126, Lot 7

Two rows of parking spaces east of the school can be replaced with pervious pavement to allow stormwater to infiltrate. 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"
49	77,104	3.7	38.9	354.0	0.060	2.11

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
Pervious pavements	0.708	119	51,956	1.95	8,954	$223,850

GREEN INFRASTRUCTURE RECOMMENDATIONS

Neve Shalom Synagogue

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

0 30' 60'

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 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)
BOUND BROOK SUBWATERSHED	**20.50**	**893,063**			**24.1**	**252.0**	**2,290.5**		**11.45**	**498,870**	**0.401**	**14.12**
Campbell Elementary												
Total Site Info	4.96	216,120	60	56	7.1	74.8	680.1	69	3.40	148,129	0.115	4.06
First Presbyterian Church												
Total Site Info	2.93	127,572	164	49	2.5	26.3	239.3	41	1.20	52,129	0.041	1.43
Hampton Park												
Total Site Info	3.57	155,385	79	25.01	1.2	12.3	112.0	16	0.56	24,389	0.019	0.67
Metuchen Borough Public Library												
Total Site Info	0.96	41,956	102	2	1.5	15.9	144.5	75	0.72	31,482	0.025	0.86
Metuchen Borough YMCA												
Total Site Info	1.28	55,576	157	57.01	1.8	19.0	173.1	68	0.87	37,700	0.048	1.68
Metuchen Municipal Court												
Total Site Info	1.43	62,364	102	25	2.3	23.6	214.8	75	1.07	46,773	0.036	1.28
New Hope Baptist Church												
Total Site Info	1.10	47,820	68	12	1.3	13.3	120.8	55	0.60	26,301	0.014	0.51
Reformed Church of Metuchen												
Total Site Info	0.85	37,117	150	30	1.3	14.1	127.8	75	0.64	27,835	0.022	0.76
Saint Francis CYO												
Total Site Info	1.03	44,844	102	37	1.6	17.0	154.4	75	0.77	33,632	0.026	0.92
Saint Luke's Episcopal Church												
Total Site Info	1.75	76,414	104	8	2.4	25.4	230.7	66	1.15	50,253	0.039	1.38
US Post Office												
Total Site Info	0.64	27,895	182	33	1.0	10.2	93.0	73	0.46	20,247	0.016	0.56

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)
MILL BROOK / MARTINS CREEK SUBWATERSHED	**41.50**	**1,807,867**			**31.5**	**330.2**	**3,001.4**		**15.01**	**653,701**	**0.509**	**17.93**
Assembly of God & Christian Academy												
Total Site Info	2.53	110,082	156	10	3.7	39.2	356.4	71	1.78	77,626	0.060	2.13
Centenary Church												
Total Site Info	6.72	292,791	124.02	54	3.4	35.4	321.8	24	1.61	70,078	0.055	1.92
Edgar Middle School												
Total Site Info	7.65	333,215	160	61	6.5	67.6	615.0	40	3.07	133,939	0.104	3.67
Mildred B. Moss Elementary School												
Total Site Info	3.03	132,159	185	69	4.1	43.3	393.8	65	1.97	85,764	0.067	2.35
Municipal Pool												
Total Site Info	11.28	491,524	155	1	8.6	90.6	823.2	36	4.12	179,302	0.140	4.92
Myrtle Charles Park												
Total Site Info	10.29	448,096	213	1.01	5.2	54.0	491.2	24	2.46	106,992	0.083	2.93
RAHWAY RIVER SOUTH BRANCH SUBWATERSHED	**30.81**	**1,342,120**			**26.3**	**275.0**	**2,500.5**		**12.50**	**544,598**	**0.424**	**14.94**
Elks Lodge												
Total Site Info	0.94	40,913	36	4	1.1	11.4	103.3	55	0.52	22,502	0.018	0.62
Metuchen First Baptist Church												
Total Site Info	1.89	82,270	162.02	7	2.8	28.9	262.7	70	1.31	57,210	0.045	1.57
Metuchen High School												
Total Site Info	24.36	1,060,921	25.01	1	18.7	195.8	1,780.5	37	8.90	387,783	0.302	10.64
Neve Shalom Synagogue												
Total Site Info	3.63	158,017	126	7	3.7	38.9	354.0	49	1.77	77,104	0.060	2.11

e. Summary of Proposed Green Infrastructure Practices

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area		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 %
		Area (SF)	Area (ac)									
	BOUND BROOK SUBWATERSHED	**118,969**	**2.73**	**3.100**	**437**	**227,180**	**8.54**	**37,099**			**$592,345**	**23.8%**
1	**Campbell Elementary**											
	Bioretention systems/ rain gardens	2,290	0.05	0.060	8	4,376	0.16	513	5	SF	$2,565	1.5%
	Total Site Info	**2,290**	**0.05**	**0.060**	**8**	**4,376**	**0.16**	**513**			**$2,565**	**1.5%**
2	**First Presbyterian Church**											
	Bioretention systems/ rain gardens	1,747	0.04	0.046	6	3,344	0.13	567	5	SF	$2,835	3.4%
	Pervious pavements	20,880	0.48	0.544	77	39,921	1.50	3,949	25	SF	$98,725	40.1%
	Total Site Info	**22,627**	**0.52**	**0.590**	**83**	**43,265**	**1.63**	**4,516**			**$101,560**	**43.4%**
3	**Hampton Park**											
	Bioretention systems/ rain gardens	4,986	0.11	0.130	18	9,530	0.36	2,072	5	SF	$10,360	20.4%
	Bioswales	4,172	0.10	0.109	15	7,974	0.30	1,734	5	SF	$8,670	17.1%
	Pervious pavements	6,688	0.15	0.174	25	12,783	0.48	6,650	25	SF	$166,250	27.4%
	Total Site Info	**15,846**	**0.36**	**0.413**	**58**	**30,287**	**1.14**	**10,456**			**$185,280**	**65.0%**
4	**Metuchen Borough Public Library**											
	Bioretention systems/ rain gardens	721	0.02	0.019	3	1,376	0.05	246	5	SF	$1,230	6.1%
	Total Site Info	**721**	**0.02**	**0.019**	**3**	**1,376**	**0.05**	**246**			**$1,230**	**6.1%**
5	**Metuchen Borough YMCA**											
	Bioretention systems/ rain gardens	3,877	0.09	0.101	14	7,413	0.28	980	5	SF	$4,900	10.3%
	Pervious pavements	19,483	0.45	0.508	72	37,250	1.40	3,516	25	SF	$87,900	51.7%
	Rainwater harvesting systems	267	0.01	0.007	1	250	0.02	250	2	gal	$500	0.7%
	Total Site Info	**23,627**	**0.54**	**0.616**	**87**	**44,913**	**1.70**	**4,746**			**$93,300**	**62.7%**
6	**Metuchen Municipal Court**											
	Bioretention systems/ rain gardens	6,609	0.15	0.172	24	12,634	0.47	3,067	5	SF	$15,335	9.9%
	Total Site Info	**6,609**	**0.15**	**0.172**	**24**	**12,634**	**0.47**	**3,067**			**$15,335**	**9.9%**
7	**New Hope Baptist Church**											
	Bioretention systems/ rain gardens	12,811	0.29	0.334	47	24,490	0.92	3,138	5	SF	$15,690	48.7%
	Pervious pavements	7,380	0.17	0.192	27	14,107	0.53	2,756	25	SF	$68,900	28.1%
	Total Site Info	**20,191**	**0.46**	**0.526**	**74**	**38,597**	**1.45**	**5,894**			**$84,590**	**76.8%**

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	**Reformed Church of Metuchen**											
	Bioretention systems/ rain gardens	2,370	0.05	0.062	9	4,533	0.17	630	5	SF	$3,150	8.5%
	Total Site Info	**2,370**	**0.05**	**0.062**	**9**	**4,533**	**0.17**	**630**			**$3,150**	**8.5%**
9	**Saint Francis CYO**											
	Bioretention systems/ rain gardens	1,437	0.03	0.037	5	2,745	0.10	441	5	SF	$2,205	4.3%
	Pervious pavements	10,822	0.25	0.282	40	20,690	0.78	1,574	25	SF	$39,350	32.2%
	Total Site Info	**12,259**	**0.28**	**0.319**	**45**	**23,435**	**0.88**	**2,015**			**$41,555**	**36.5%**
10	**Saint Luke's Episcopal Church**											
	Bioretention systems/ rain gardens	4,894	0.11	0.128	18	9,357	0.35	2,513	5	SF	$12,565	9.7%
	Total Site Info	**4,894**	**0.11**	**0.128**	**18**	**9,357**	**0.35**	**2,513**			**$12,565**	**9.7%**
11	**US Post Office**											
	Bioswales	3,110	0.07	0.081	11	5,947	0.22	568	5	SF	$2,840	15.4%
	Pervious pavements	4,425	0.10	0.115	16	8,460	0.32	1,935	25	SF	$48,375	21.9%
	Total Site Info	**7,535**	**0.17**	**0.196**	**28**	**14,407**	**0.54**	**2,503**			**$51,215**	**37.2%**
	MILL BROOK / MARTINS CREEK SUBWATERSHED	**139,560**	**3.20**	**3.636**	**527**	**266,811**	**10.02**	**39,331**			**$860,075**	**37.5%**
12	**Assembly of God & Christian Academy**											
	Bioretention systems/ rain gardens	1,981	0.05	0.052	9	3,785	0.14	545	5	SF	$2,725	2.6%
	Pervious pavements	36,656	0.84	0.955	135	70,080	2.63	9,226	25	SF	$230,650	47.2%
	Total Site Info	**38,637**	**0.89**	**1.007**	**143**	**73,865**	**2.77**	**9,771**			**$233,375**	**49.8%**
13	**Centenary Church**											
	Bioretention systems/ rain gardens	1,417	0.03	0.037	6	2,708	0.10	1,045	5	SF	$5,225	2.0%
	Total Site Info	**1,417**	**0.03**	**0.037**	**6**	**2,708**	**0.10**	**1,045**			**$5,225**	**2.0%**
14	**Edgar Middle School**											
	Bioretention systems/ rain gardens	14,007	0.32	0.365	61	26,778	1.01	3,557	5	SF	$17,785	10.5%
	Total Site Info	**14,007**	**0.32**	**0.365**	**61**	**26,778**	**1.01**	**3,557**			**$17,785**	**10.5%**

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area		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 %
		Area (SF)	Area (ac)									
15	**Mildred B. Moss Elementary School**											
	Bioretention systems/ rain gardens	4,009	0.09	0.104	17	7,667	0.29	1,013	5	SF	$5,065	4.7%
	Pervious pavements	12,948	0.30	0.337	48	24,751	0.93	3,015	25	SF	$75,375	15.1%
	Total Site Info	**16,957**	**0.39**	**0.442**	**65**	**32,418**	**1.22**	**4,028**			**$80,440**	**19.8%**
16	**Municipal Pool**											
	Pervious pavements	54,148	1.24	1.411	199	103,523	3.89	13,463	25	SF	$336,575	30.2%
	Total Site Info	**54,148**	**1.24**	**1.411**	**199**	**103,523**	**3.89**	**13,463**			**$336,575**	**30.2%**
17	**Myrtle-Charles Park**											
	Pervious pavements	14,394	0.33	0.375	53	27,519	1.03	7,467	25	SF	$186,675	13.5%
	Total Site Info	**14,394**	**0.33**	**0.375**	**53**	**27,519**	**1.03**	**7,467**			**$186,675**	**13.5%**
	RAHWAY RIVER SOUTH BRANCH SUBWATERSHED	**74,710**	**1.72**	**1.947**	**326**	**142,845**	**5.37**	**22,205**			**$522,825**	**16.1%**
18	**Elks Lodge**											
	Bioretention systems/ rain gardens	1,614	0.04	0.042	7	3,089	0.12	302	5	SF	$1,510	7.2%
	Pervious pavements	15,073	0.35	0.393	66	28,820	1.08	3,755	25	SF	$93,875	67.0%
	Total Site Info	**16,687**	**0.38**	**0.435**	**73**	**31,909**	**1.20**	**4,057**			**$95,385**	**74.2%**
19	**Metuchen First Baptist Church**											
	Bioretention systems/ rain gardens	1,348	0.03	0.035	6	2,581	0.10	398	5	SF	$1,990	2.4%
	Pervious pavements	25,876	0.59	0.674	113	49,473	1.86	7,881	25	SF	$197,025	45.2%
	Total Site Info	**27,224**	**0.62**	**0.709**	**119**	**52,054**	**1.96**	**8,279**			**$199,015**	**47.6%**
20	**Metuchen High School**											
	Bioretention systems/ rain gardens	3,623	0.08	0.094	16	6,926	0.26	915	5	SF	$4,575	0.9%
	Total Site Info	**3,623**	**0.08**	**0.094**	**16**	**6,926**	**0.26**	**915**			**$4,575**	**0.9%**
21	**Neve Shalom Synagogue**											
	Pervious pavements	27,176	0.62	0.708	119	51,956	1.95	8,954	25	SF	$223,850	35.2%
	Total Site Info	**27,176**	**0.62**	**0.708**	**119**	**51,956**	**1.95**	**8,954**			**$223,850**	**35.2%**