RUTGERS
New Jersey Agricultural
Experiment Station

Draft

Impervious Cover Reduction Action Plan
for
Springfield Township, Union County, New Jersey

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

November 16, 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 Union County in central New Jersey, Springfield Township covers approximately 5.2 square miles. Figures 1 and 2 illustrate that Springfield Township is dominated by urban land uses. A total of 73.6% of the municipality's land use is classified as urban. Of the urban land in Springfield 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 Springfield 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 Springfield Township. Based upon the 2007 NJDEP land use/land cover data, approximately 31.0% of Springfield Township has impervious cover. This level of impervious cover suggests that the streams in Springfield Township are likely non-supporting streams.[1]

Methodology

Springfield 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

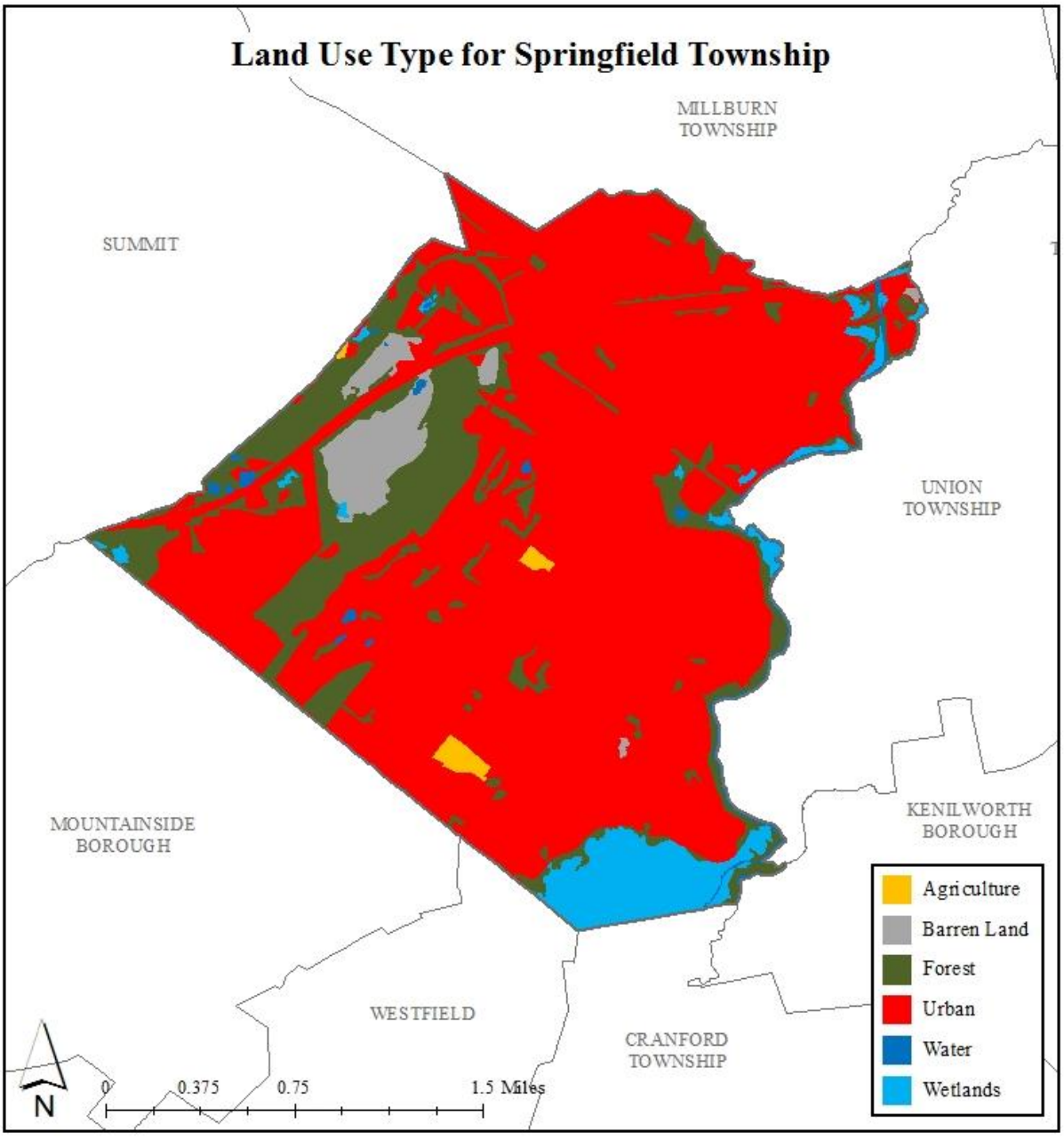


Figure 1: Map illustrating the land use in Springfield Township

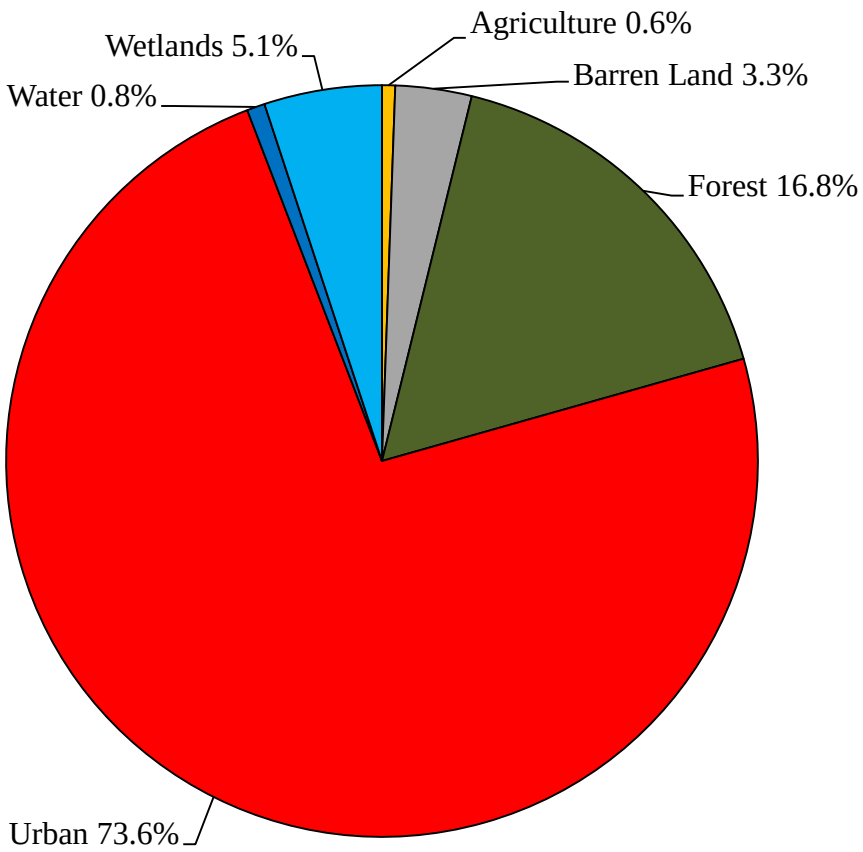


Figure 2: Pie chart illustrating the land use in Springfield Township

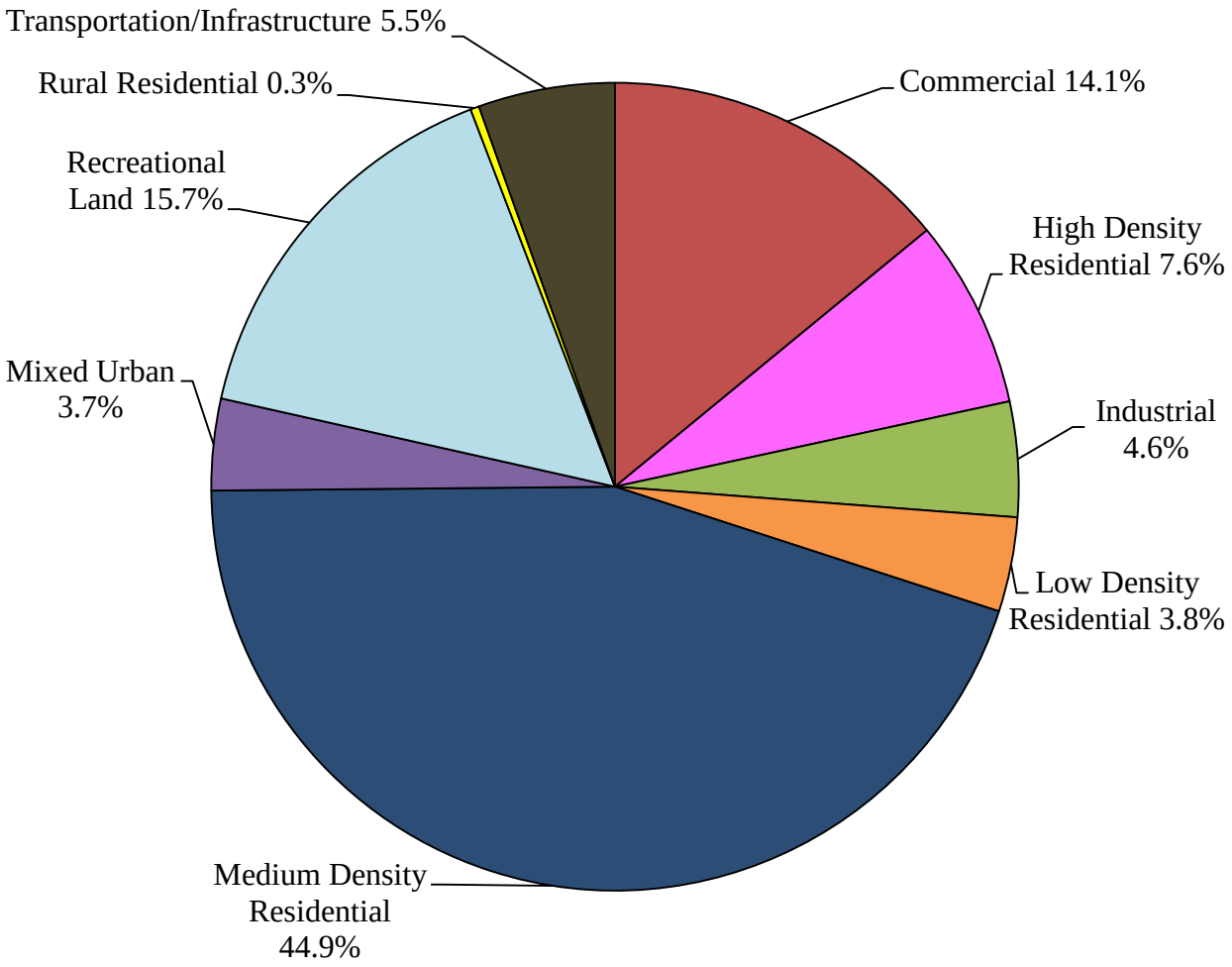


Figure 3: Pie chart illustrating the various types of urban land use in Springfield Township

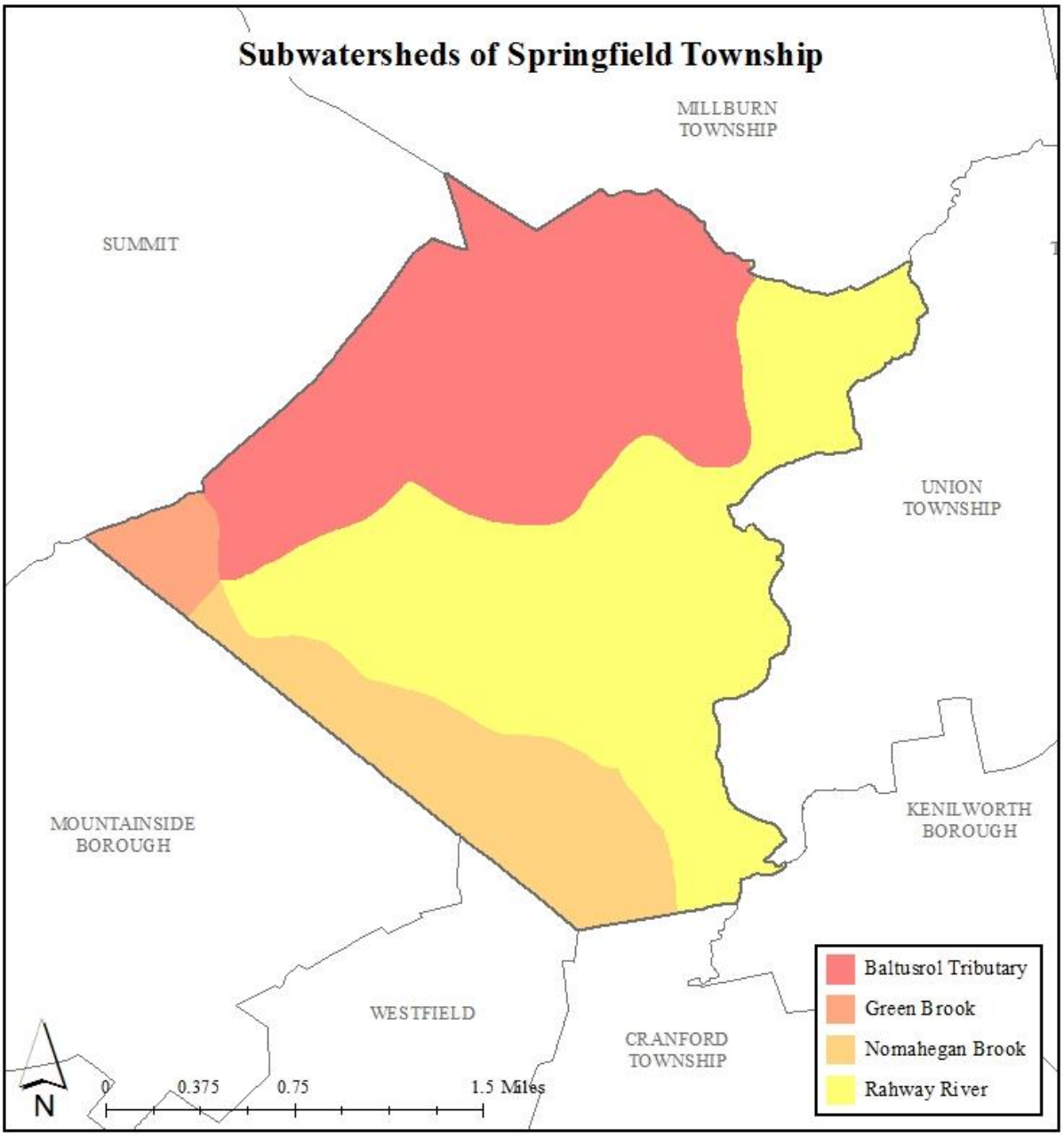


Figure 4: Map of the subwatersheds in Springfield Township

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 Springfield 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 Springfield 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*.

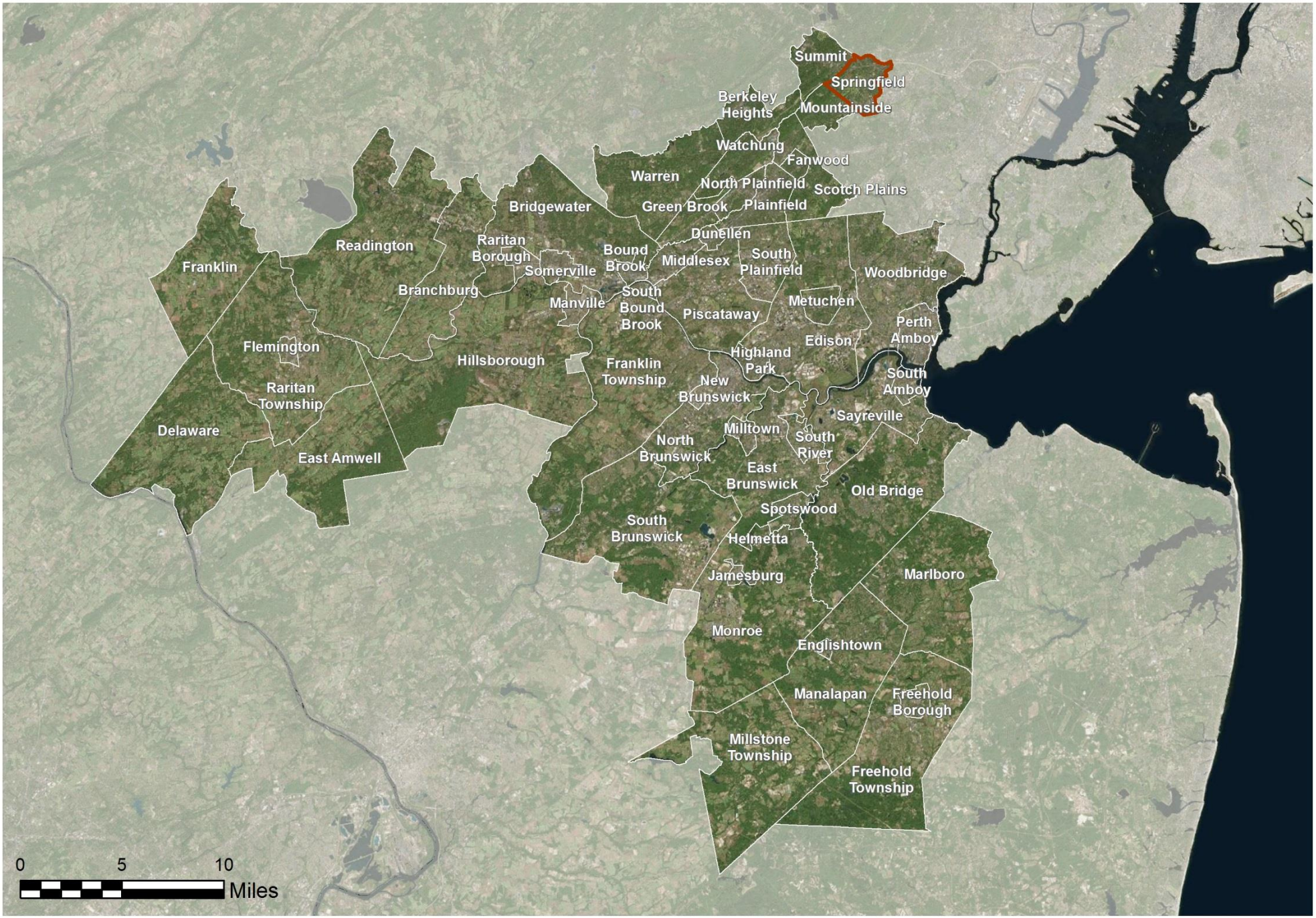
Conclusion

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.

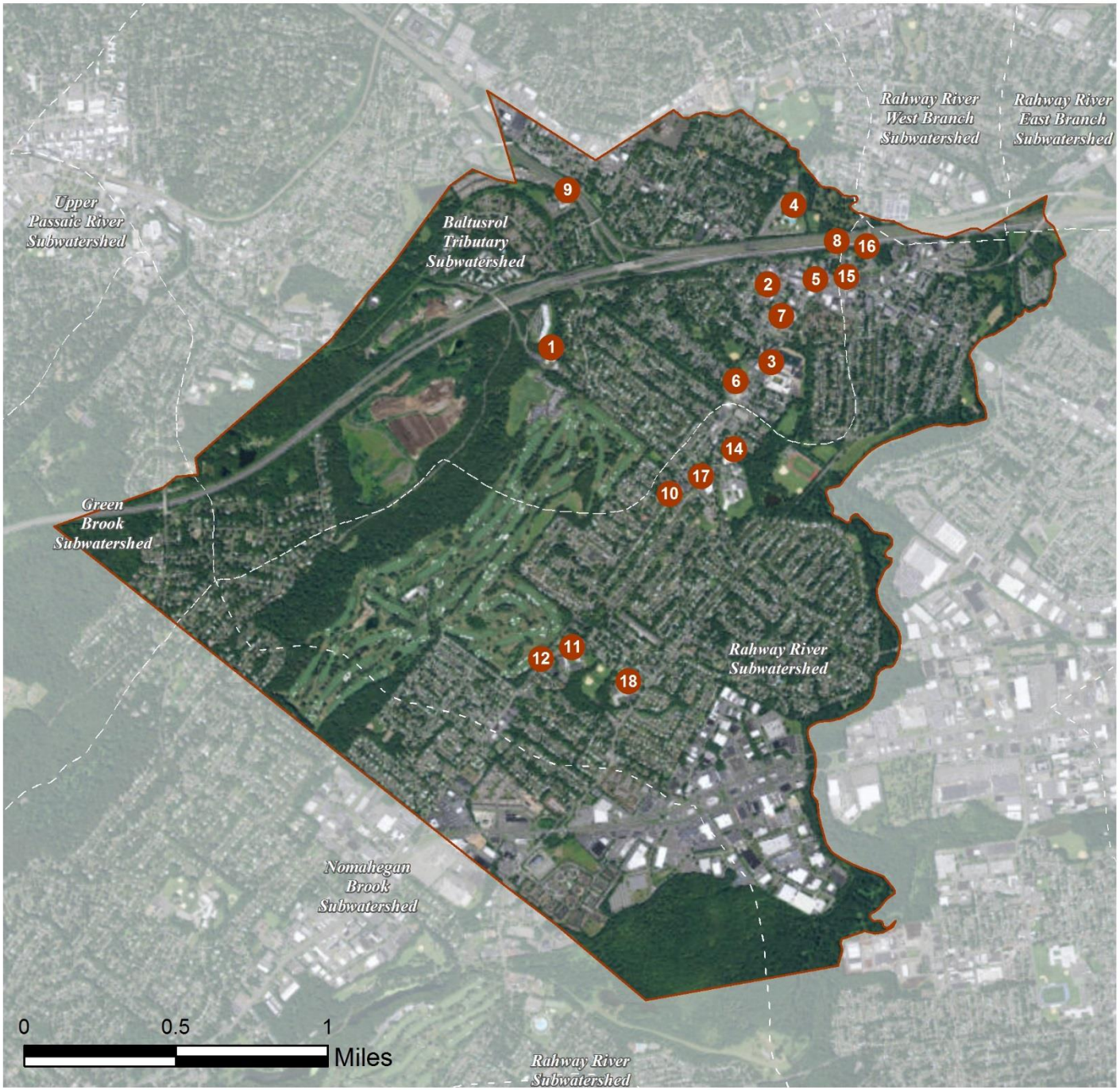
a. Overview Map of the Project

SPRINGFIELD: CLIMATE RESILIENT GREEN INFRASTRUCTURE FOR THE RARITAN BASIN



b. Green Infrastructure Sites

SPRINGFIELD: GREEN INFRASTRUCTURE SITES



SITES WITHIN THE BALTUSROL TRIBUTARY SUBWATERSHED:

1. Calvary Assembly of God
2. James Caldwell Elementary School
3. Jonathan Dayton High School
4. Springfield Community Pool
5. Springfield Department of Public Works
6. Springfield Fire Department
7. Springfield Municipal Court
8. Springfield Presbyterian Church
9. Temple Beth Ahm Yisrael

SITES WITHIN THE RAHWAY RIVER SUBWATERSHED:

10. Congregation Israel
11. Edward V. Walton School
12. Holy Cross Lutheran Church
13. Raymond Chisholm Community Center
14. Saint James the Apostle Parish Community
15. Sarah Baily Senior and Civic Center
16. Springfield Emanuel United Methodist Church
17. Temple Sha'arey Shalom
18. Thelma L. Sandmeier School

c. Proposed Green Infrastructure Concepts

CALVARY ASSEMBLY OF GOD

Subwatershed: Baltusrol Tributary

Site Area: 138,917 sq. ft.

Address: 242 Shunpike Road
Springfield, NJ 07081

Block and Lot: Block 1105, Lot 25

Rain gardens can be installed to capture, treat, and infiltrate roof runoff. Pervious pavement can replace existing parking spaces to allow parking lot runoff to infiltrate. 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"
64	88,845	4.3	44.9	407.9	0.069	2.44

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	0.136	23	10,337	0.39	2,205	$11,025
Pervious pavements	0.792	133	4,353	0.16	9,336	$233,400

GREEN INFRASTRUCTURE RECOMMENDATIONS

Calvary Assembly of God

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

0 50' 100'

JAMES CALDWELL ELEMENTARY SCHOOL

Subwatershed: Baltusrol Tributary

Site Area: 113,228 sq. ft.

Address: 36 Caldwell Place
Springfield, NJ 07081

Block and Lot: Block 705, Lot 7

Parking spaces and the play court can be converted into pervious pavement to 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"
60	68,419	3.3	34.6	314.1	0.053	1.88

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	0.861	144	65,263	2.45	26,679	$666,975

GREEN INFRASTRUCTURE RECOMMENDATIONS

James Caldwell Elementary School

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

0 50' 100'

JONATHAN DAYTON HIGH SCHOOL

Subwatershed: **Baltusrol Tributary**

Site Area: **460,030 sq. ft.**

Address: **139 Mountain Avenue**
Springfield, NJ 07081

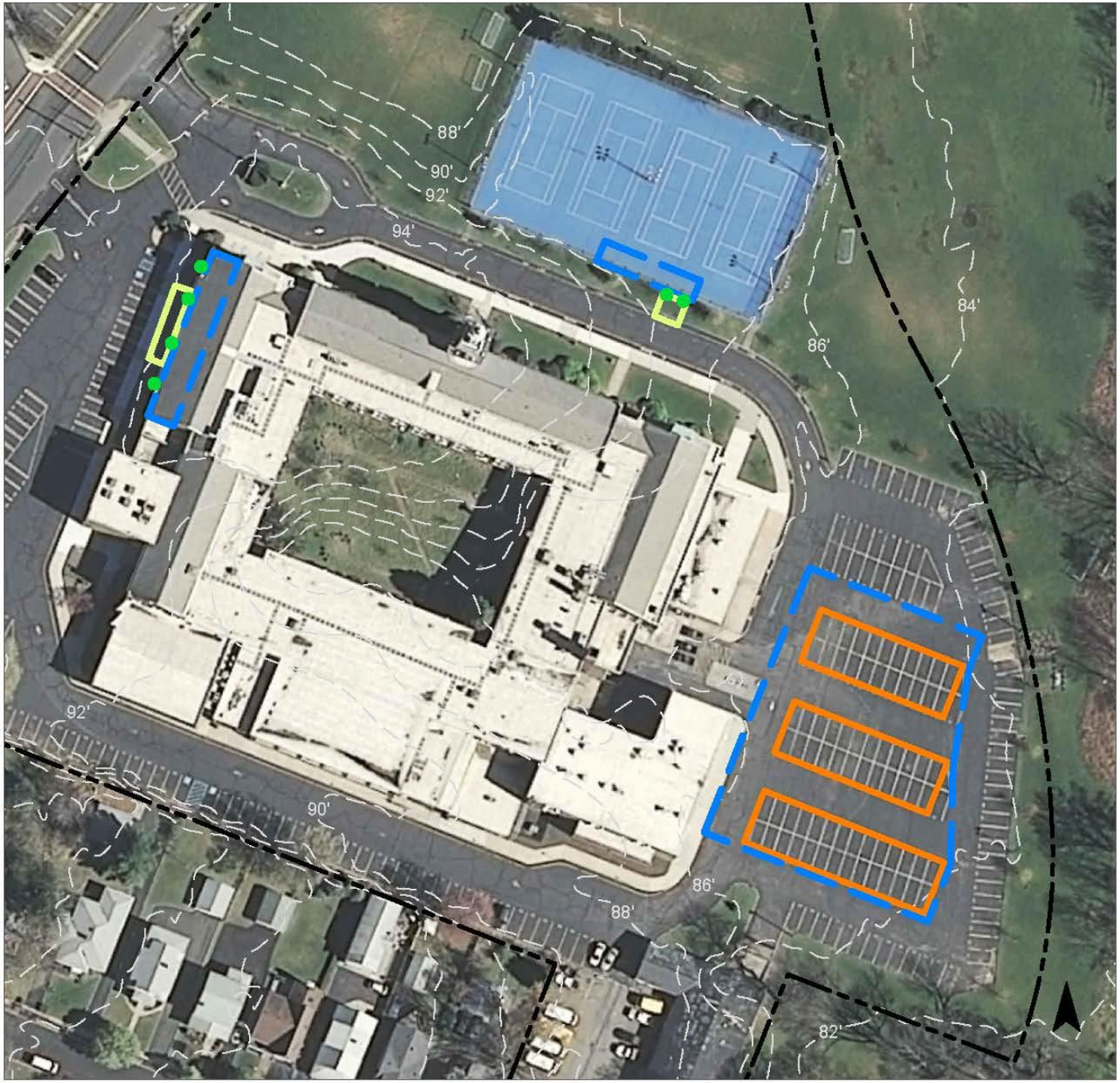
Block and Lot: **Block 802, Lot 2**

Two rain gardens have already been built at the front entrance of the school. Additional rain gardens can be installed on the northwest side of the main building and adjacent to the shed by the fields. Parking spaces can be replaced with pervious pavement to 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"
65	301,209	14.5	152.1	1,383.0	0.235	8.26

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	0.079	13	6,021	0.23	810	$4,050
Pervious pavement	0.678	114	51,365	1.93	12,055	$301,375

GREEN INFRASTRUCTURE RECOMMENDATIONS



Jonathan Dayton High School

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

0 50' 100'

SPRINGFIELD COMMUNITY POOL

Subwatershed: Baltusrol Tributary

Site Area: 667,714 sq. ft.

Address: 44 Morrison Road
Springfield, NJ 07081

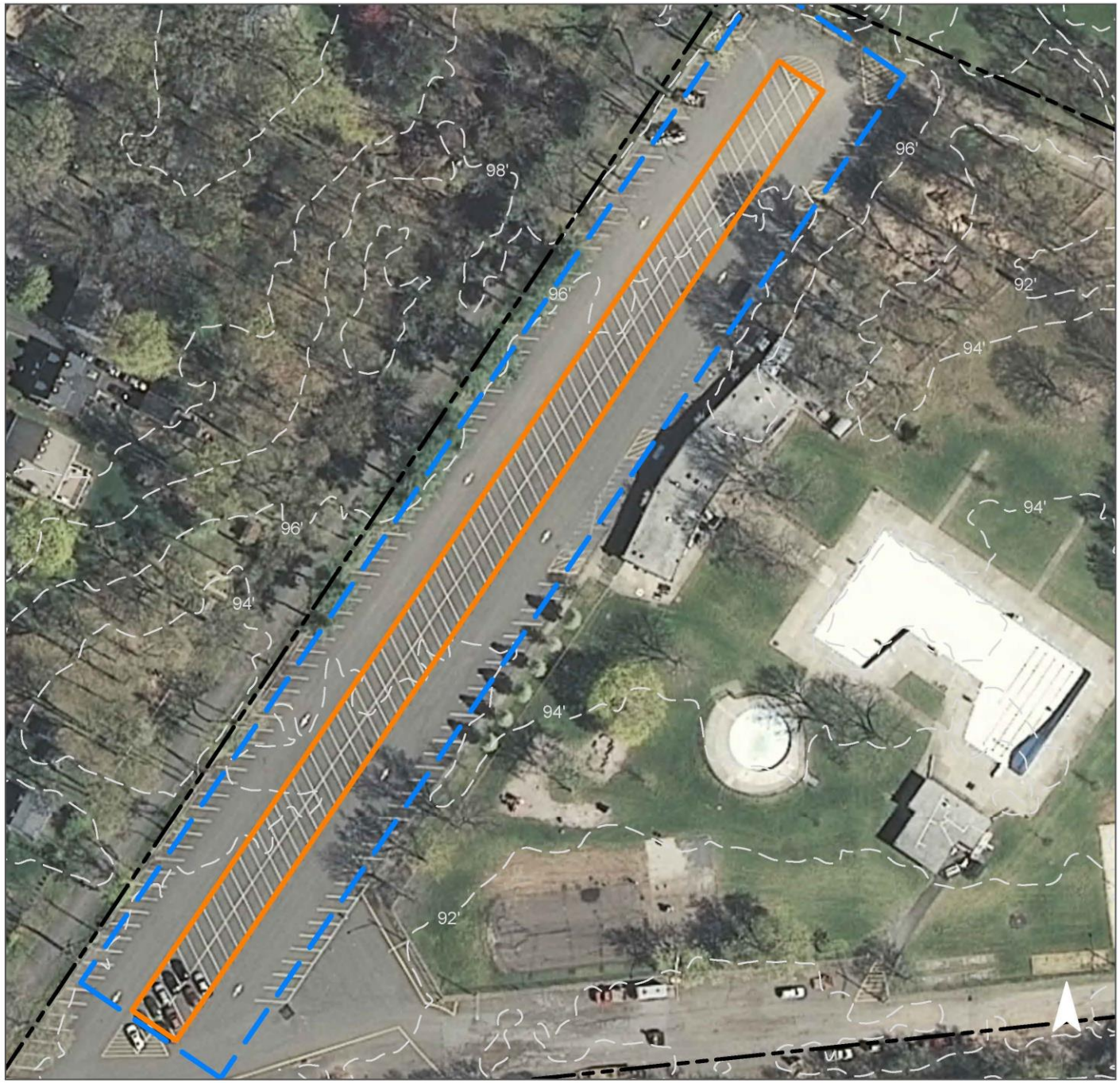
Block and Lot: Block 202, Lot 23

Parking spaces can be replaced with pervious pavement to capture 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"
29	190,945	9.2	96.4	876.7	0.149	5.24

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	2.299	385	174,202	6.54	26,350	$658,750

GREEN INFRASTRUCTURE RECOMMENDATIONS



Springfield Community Pool

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

0 50' 100'

SPRINGFIELD DEPARTMENT OF PUBLIC WORKS

Subwatershed: Baltusrol Tributary

Site Area: 66,374 sq. ft.

Address: 22 Mountain Avenue
Springfield, NJ 07081

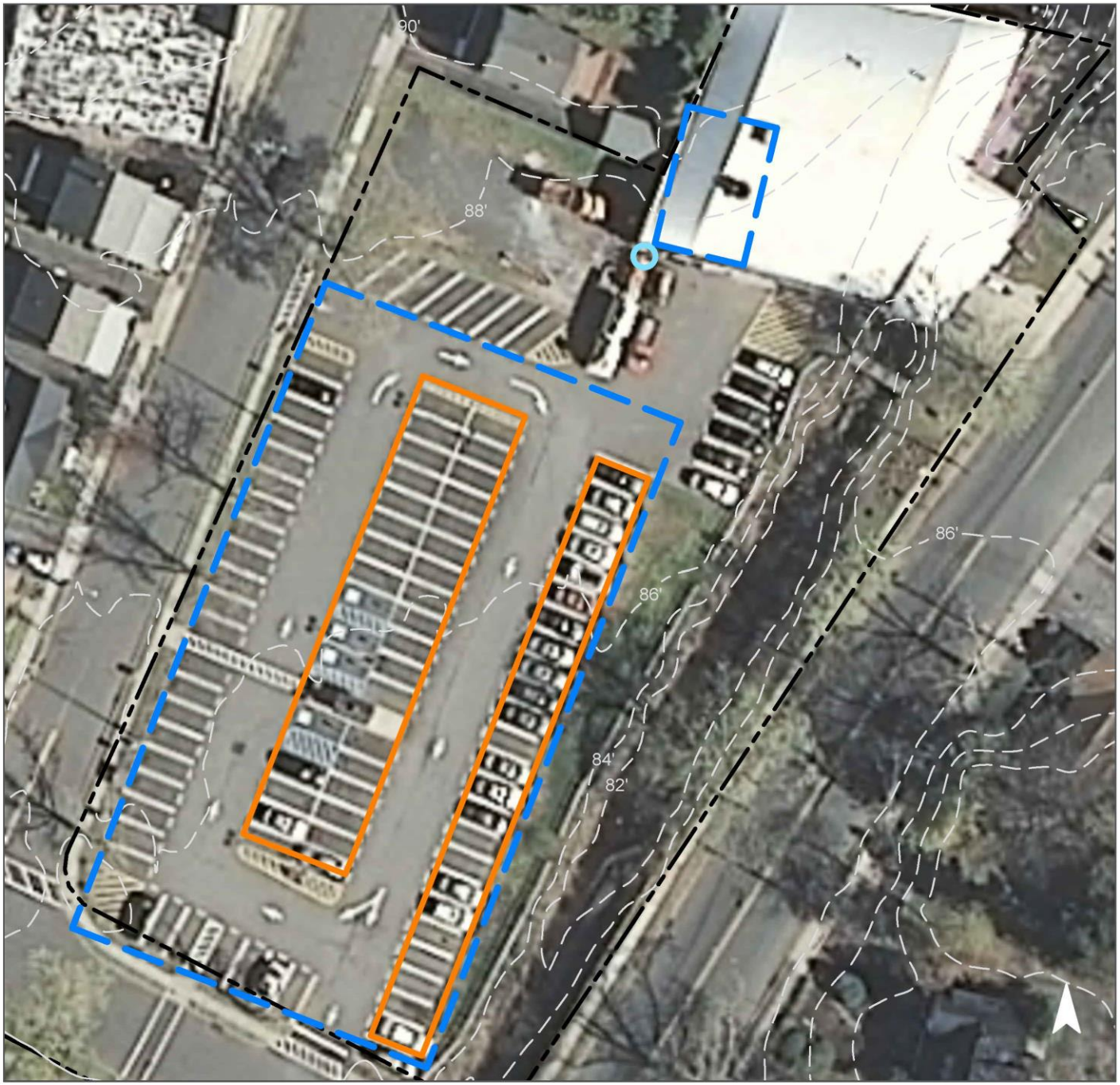
Block and Lot: Block 707, Lot 10

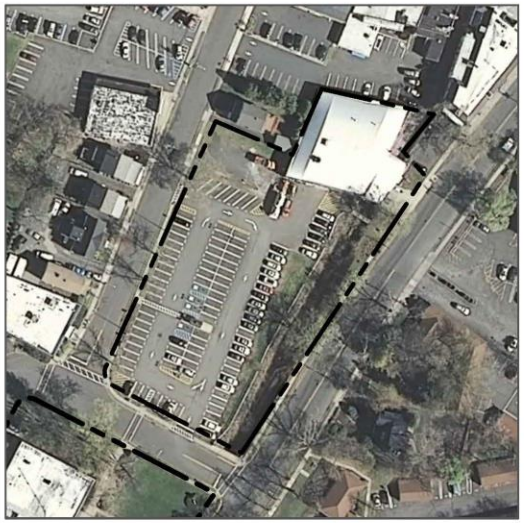
There is an existing rain garden with curb cuts in an area near the stream. Parking spaces can be replaced with pervious pavement to infiltrate additional stormwater. Rainwater can also be harvested in a cistern and used to wash department vehicles. A preliminary soil assessment suggests that more soil 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"
79	52,258	2.5	26.4	239.9	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
Pervious pavements	0.737	123	55,838	2.10	9,440	$236,000
Rainwater harvesting systems	0.036	6	1,290	0.10	1,290 (gal)	$2,581

GREEN INFRASTRUCTURE RECOMMENDATIONS





Springfield Department of Public Works

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

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SPRINGFIELD FIRE DEPARTMENT

Subwatershed: Baltusrol Tributary

Site Area: 42,119 sq. ft.

Address: 200 Mountain Avenue
Springfield, NJ 07081

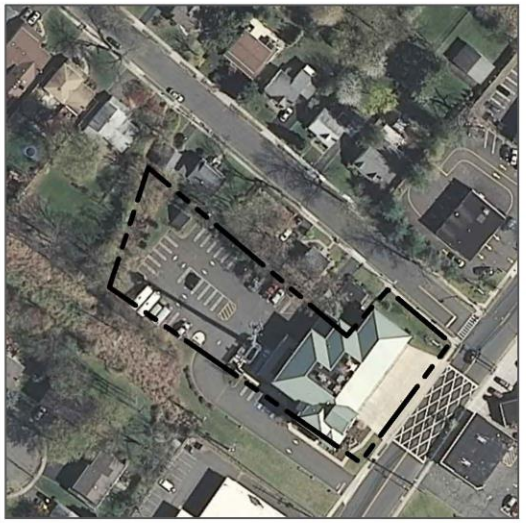
Block and Lot: Block 1202, Lot 35

A cistern can be installed to harvest rainwater that can be used to wash emergency vehicles. Parking spaces can also 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"
70	29,301	1.4	14.8	134.5	0.023	0.80

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	0.198	33	15,992	0.60	992	$24,800
Rainwater harvesting systems	0.018	3	637	0.09	637 (gal)	$1,273

GREEN INFRASTRUCTURE RECOMMENDATIONS



Springfield Fire Department

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

0 25' 50'

SPRINGFIELD MUNICIPAL COURT

Subwatershed: **Baltusrol Tributary**

Site Area: **42,000 sq. ft.**

Address: **100 Mountain Avenue**
Springfield, NJ 07081

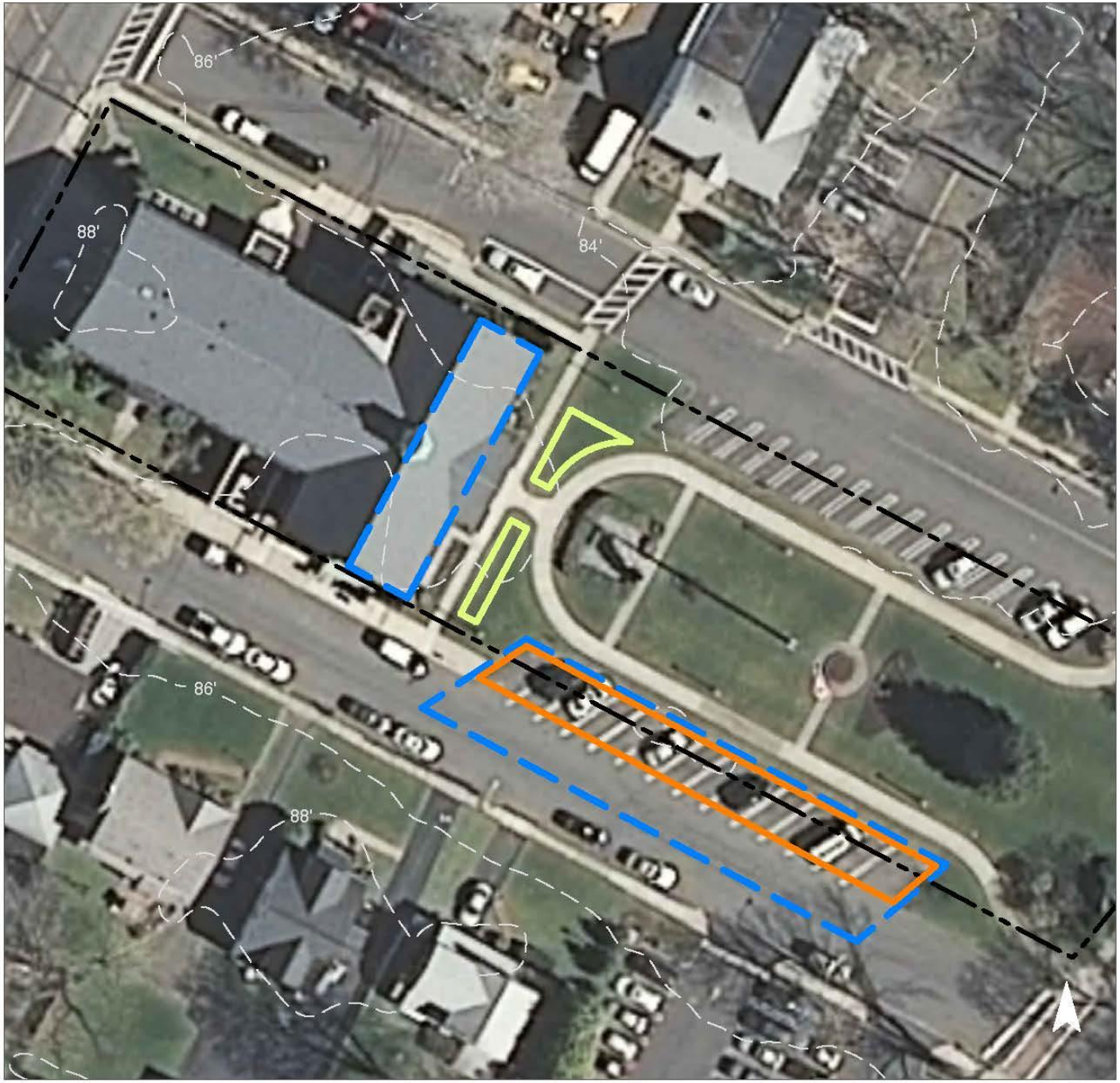
Block and Lot: **Block 711, Lot 1**

Rain gardens can be installed to capture, treat, and infiltrate roof runoff. Parking spaces can also be replaced with pervious pavement 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"
65	27,300	1.3	13.8	125.3	0.021	0.75

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	3,972	0.15	478	$2,390
Pervious pavements	0.149	25	11,295	0.42	2,581	$64,525

GREEN INFRASTRUCTURE RECOMMENDATIONS



Springfield Municipal Court

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

0 25' 50'

SPRINGFIELD PRESBYTERIAN CHURCH

Subwatershed: Baltusrol Tributary

Site Area: 39,016 sq. ft.

Address: 37 Church Mall
Springfield, NJ 07081

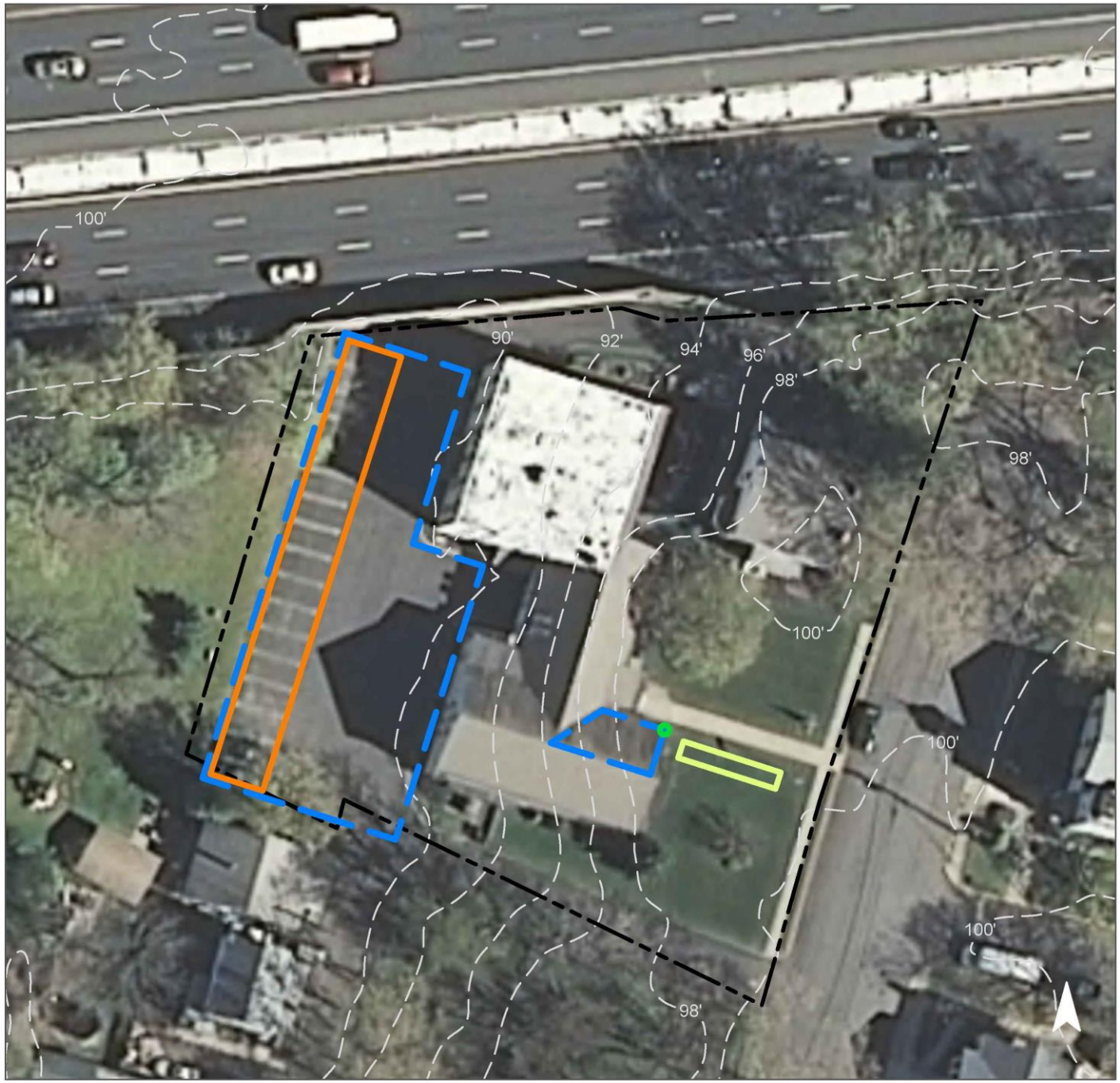
Block and Lot: Block 206, Lot 23

Parking spaces can be replaced with pervious pavement to infiltrate parking lot runoff. A rain garden 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"
63	24,512	1.2	12.4	112.5	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	0.011	2	838	0.03	190	$950
Pervious pavements	0.228	38	17,249	0.65	2,684	$67,100

GREEN INFRASTRUCTURE RECOMMENDATIONS



Springfield Presbyterian Church

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

0 25' 50'

TEMPLE BETH AHM YISRAEL

Subwatershed: Baltusrol Tributary

Site Area: 193,703 sq. ft.

Address: 60 Temple Drive
Springfield, NJ 07081

Block and Lot: Block 506, Lot 1

Parking spaces can be replaced with pervious pavement to capture and infiltrate runoff. Bioretention systems can be installed to capture, treat, and infiltrate rooftop 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"
61	117,917	5.7	59.6	541.4	0.092	3.23

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	0.121	20	9,141	0.34	1,160	$5,800
Pervious pavements	0.264	44	19,972	0.75	3,816	$95,400

GREEN INFRASTRUCTURE RECOMMENDATIONS

Temple Beth Ahm Yisrael

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

0 50' 100'

CONGREGATION ISRAEL

Subwatershed: Rahway River

Site Area: 50,549 sq. ft.

Address: 339 Mountain Avenue
Springfield, NJ 07081

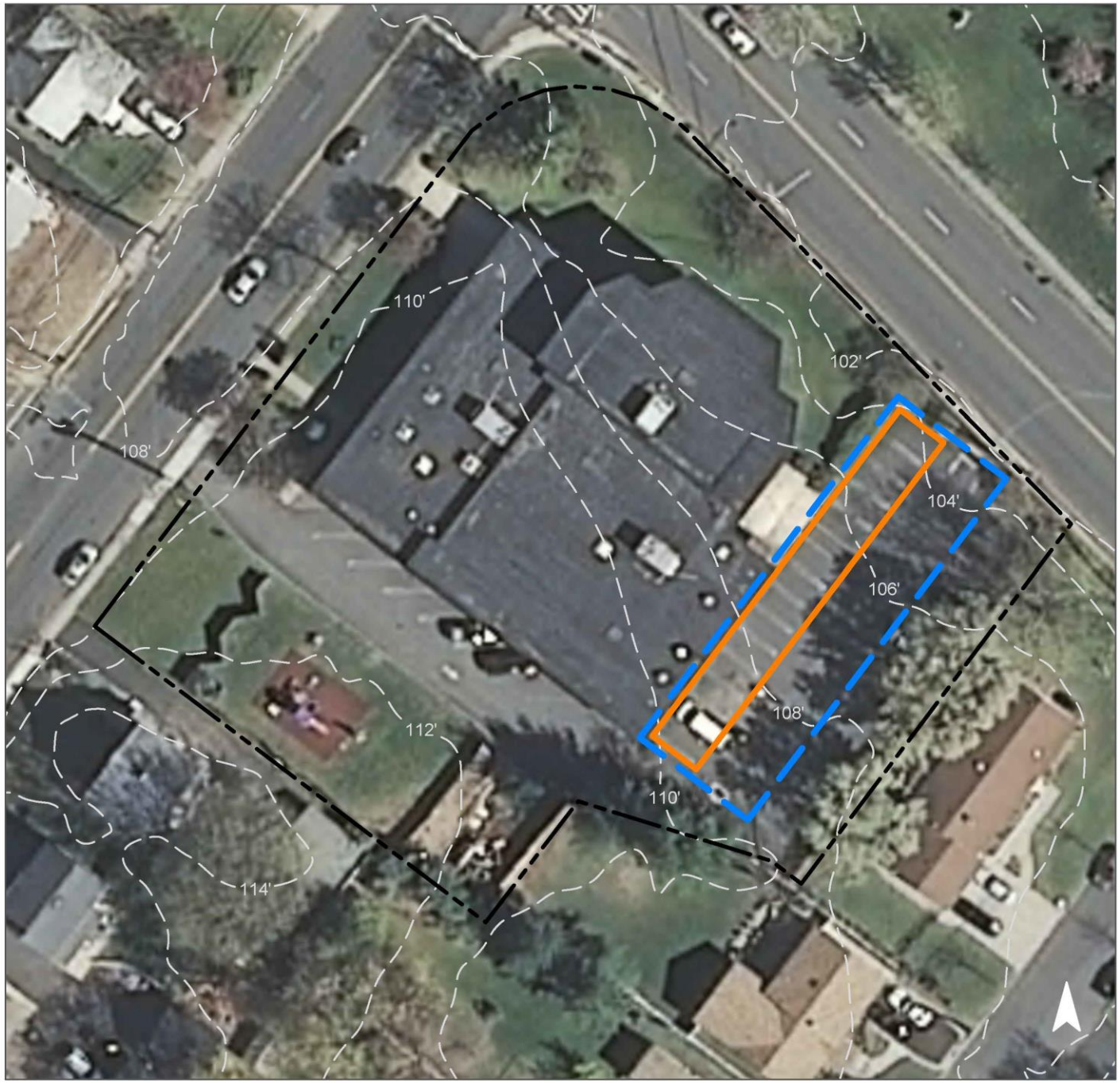
Block and Lot: Block 1801, Lot 36

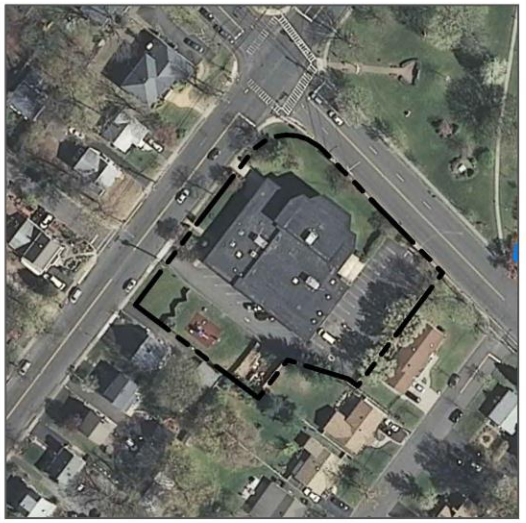
Parking spaces can be converted into pervious pavement to infiltrate runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

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"
75	37,911	1.8	19.1	174.1	0.030	1.04

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	0.163	27	12,320	0.46	2,415	$60,375

GREEN INFRASTRUCTURE RECOMMENDATIONS





Congregation Israel

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

0 25' 50'

EDWARD V. WALTON SCHOOL

Subwatershed: Rahway River

Site Area: 557,293 sq. ft.

Address: 601 Mountain Avenue
Springfield, NJ 07081

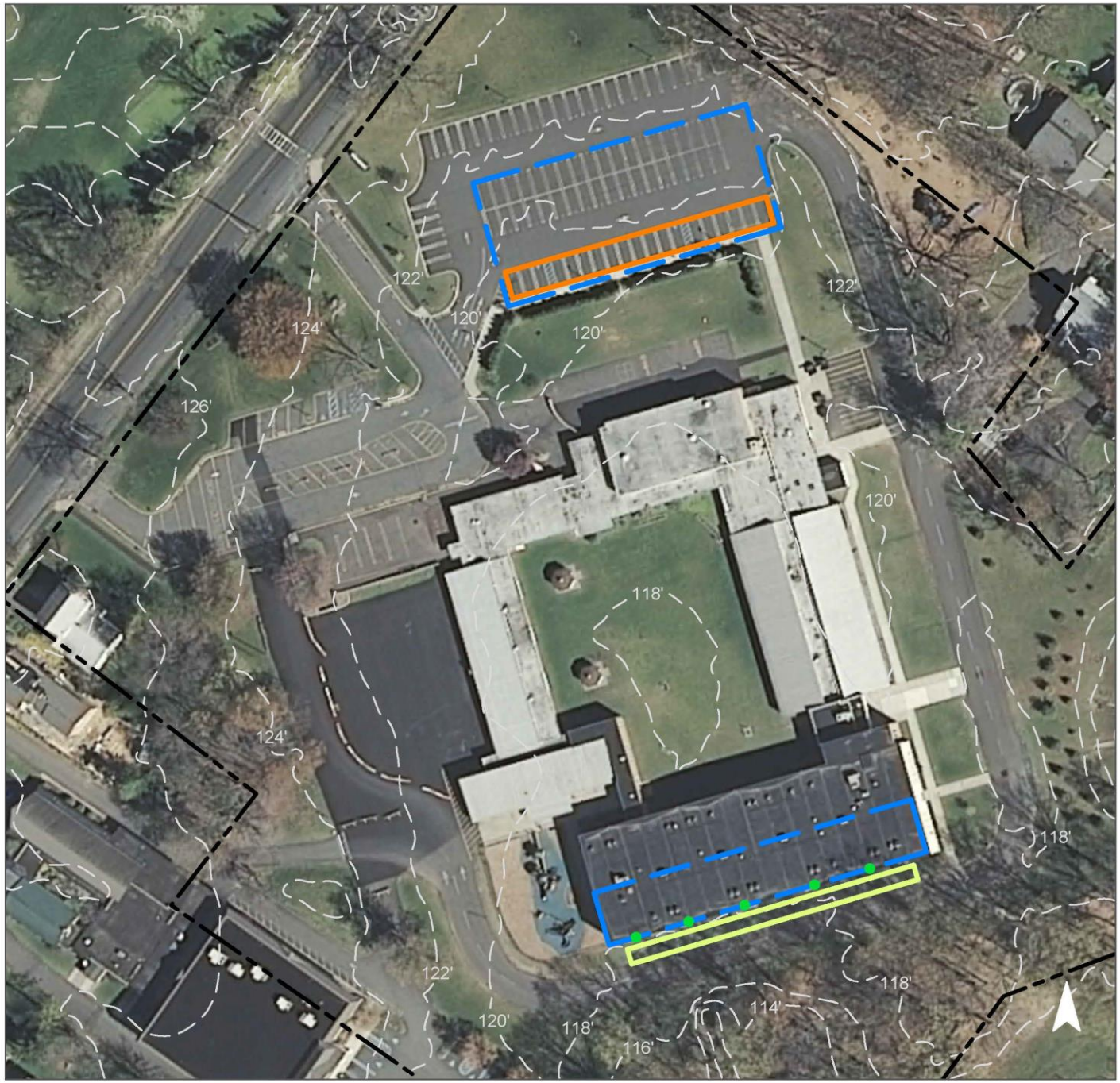
Block and Lot: Block 2901, Lot 78

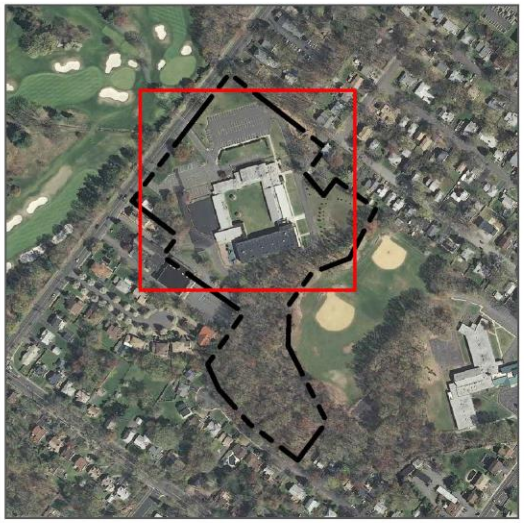
Parking spaces can be replaced using pervious pavement to allow stormwater to infiltrate. A rain garden can also be installed to capture, treat, and infiltrate roof runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green 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"
41	229,951	11.1	116.1	1,055.8	0.179	6.31

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	0.202	34	15,274	0.57	1,921	$9,605
Pervious pavement	0.407	68	30,803	1.16	3,205	$80,125

GREEN INFRASTRUCTURE RECOMMENDATIONS





Edward V. Walton School

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

0 50' 100'

HOLY CROSS LUTHERAN CHURCH

Subwatershed: Rahway River

Site Area: 71,810 sq. ft.

Address: 639 Mountain Avenue
Springfield, NJ 07081

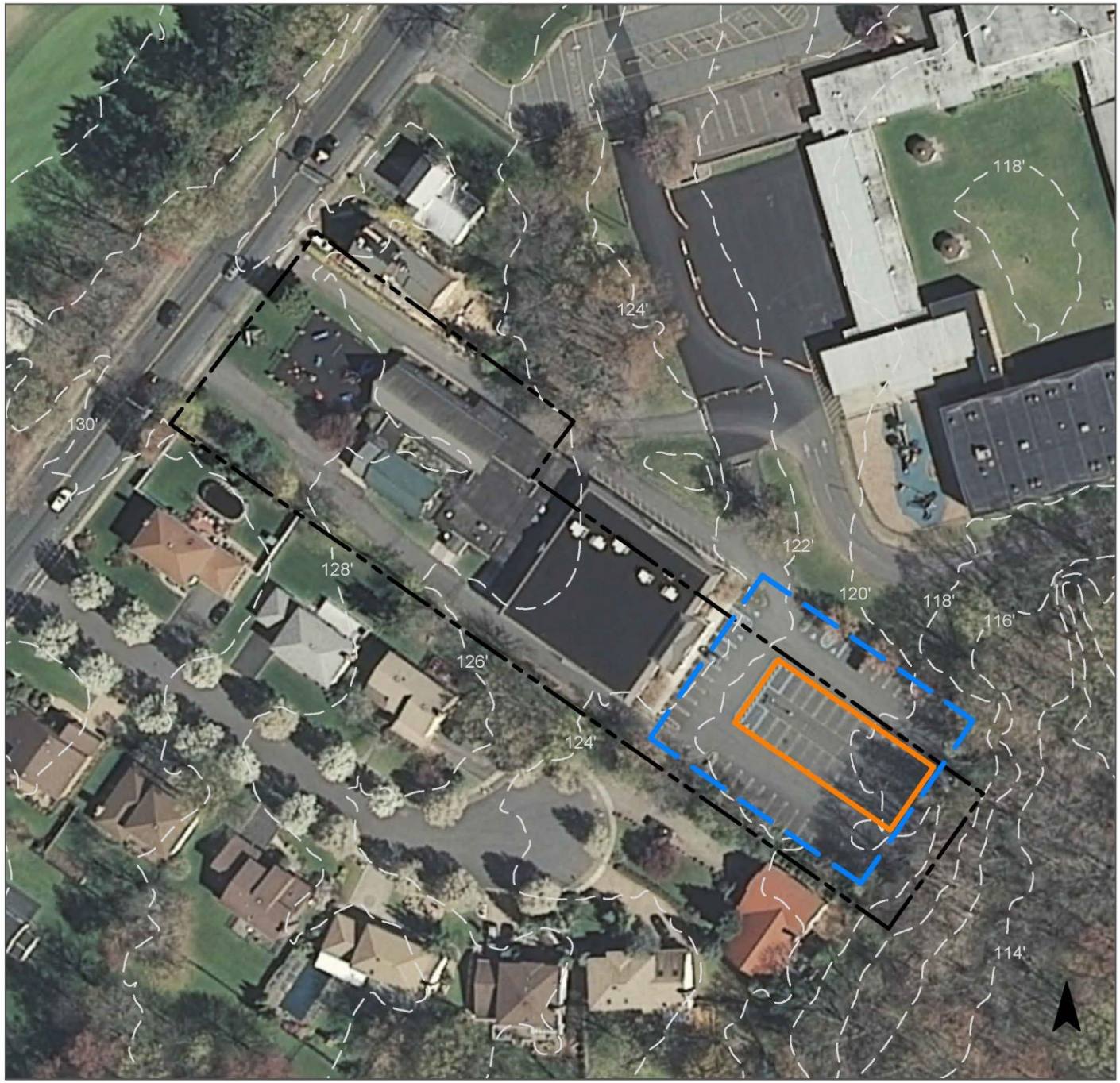
Block and Lot: Block 2901, Lot 75

Parking spaces can be replaced with pervious pavement to capture and infiltrate 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"
74	52,894	2.5	26.7	242.9	0.041	1.45

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	0.566	95	42,898	1.61	6,205	$155,125

GREEN INFRASTRUCTURE RECOMMENDATIONS



Holy Cross Lutheran Church

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

0 50' 100'

RAYMOND CHISHOLM COMMUNITY CENTER

Subwatershed: Rahway River

Site Area: 176,278 sq. ft.

Address: 100 S. Springfield Avenue
Springfield, NJ 07081

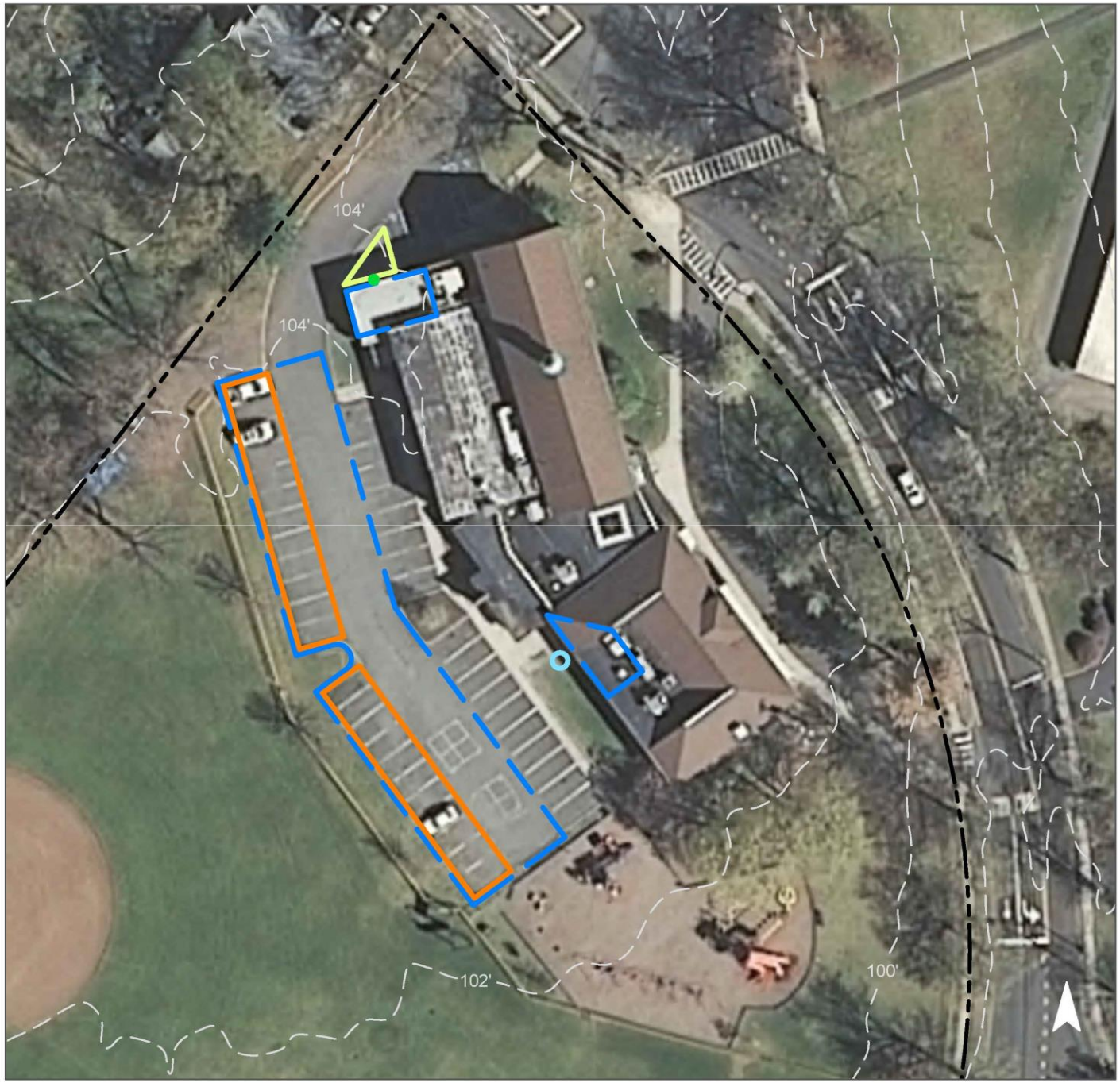
Block and Lot: Block 1804, Lot 6

Parking spaces can be replaced with pervious pavement to infiltrate parking lot runoff. Rainwater can also be harvested in a cistern to be used to conduct car wash fund raisers or to water the existing landscape. A bioretention system can be installed to capture, treat, and infiltrate rooftop 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"
39	68,148	3.3	34.4	312.9	0.053	1.87

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	0.016	3	1,174	0.04	180	$900
Pervious pavements	0.249	42	18,894	0.71	3,742	$93,550
Rainwater harvesting systems	0.013	2	474	0.04	474 (gal)	$948

GREEN INFRASTRUCTURE RECOMMENDATIONS



Raymond Chisholm Community Center

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

0 30' 60'

SAINT JAMES THE APOSTLE PARISH COMMUNITY

Subwatershed: Rahway River

Site Area: 211,850 sq. ft.

Address: 41 S Springfield Avenue
Springfield, NJ 07081

Block and Lot: Block 1402, Lot 6

Rain gardens can be installed to capture, treat, and infiltrate roof runoff. Parking spaces can also be converted into pervious pavement to 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"
62	130,939	6.3	66.1	601.2	0.102	3.59

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	0.073	12	5,513	0.21	850	$4,250
Pervious pavements	0.425	71	32,209	1.21	5,330	$133,250

GREEN INFRASTRUCTURE RECOMMENDATIONS

Saint James The Apostle Parish Community

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

0 50' 100'

SARAH BAILY SENIOR AND CIVIC CENTER

Subwatershed: Rahway River

Site Area: 13,504 sq. ft.

Address: 30 Church Mall
Springfield, NJ 07081

Block and Lot: Block 208, Lot 7

A rain garden can capture, treat, and infiltrate roof runoff. 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"
32	4,301	0.2	2.2	19.7	0.003	0.12

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	1,414	0.05	140	$700
Pervious pavements	0.071	12	5,408	0.20	1,400	$35,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

Sarah Bailey Senior and Civic Center

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

0 25' 50'

SPRINGFIELD EMANUEL UNITED METHODIST CHURCH

Subwatershed: Rahway River

Site Area: 71,790 sq. ft.

Address: 40 Church Mall
Springfield, NJ 07081

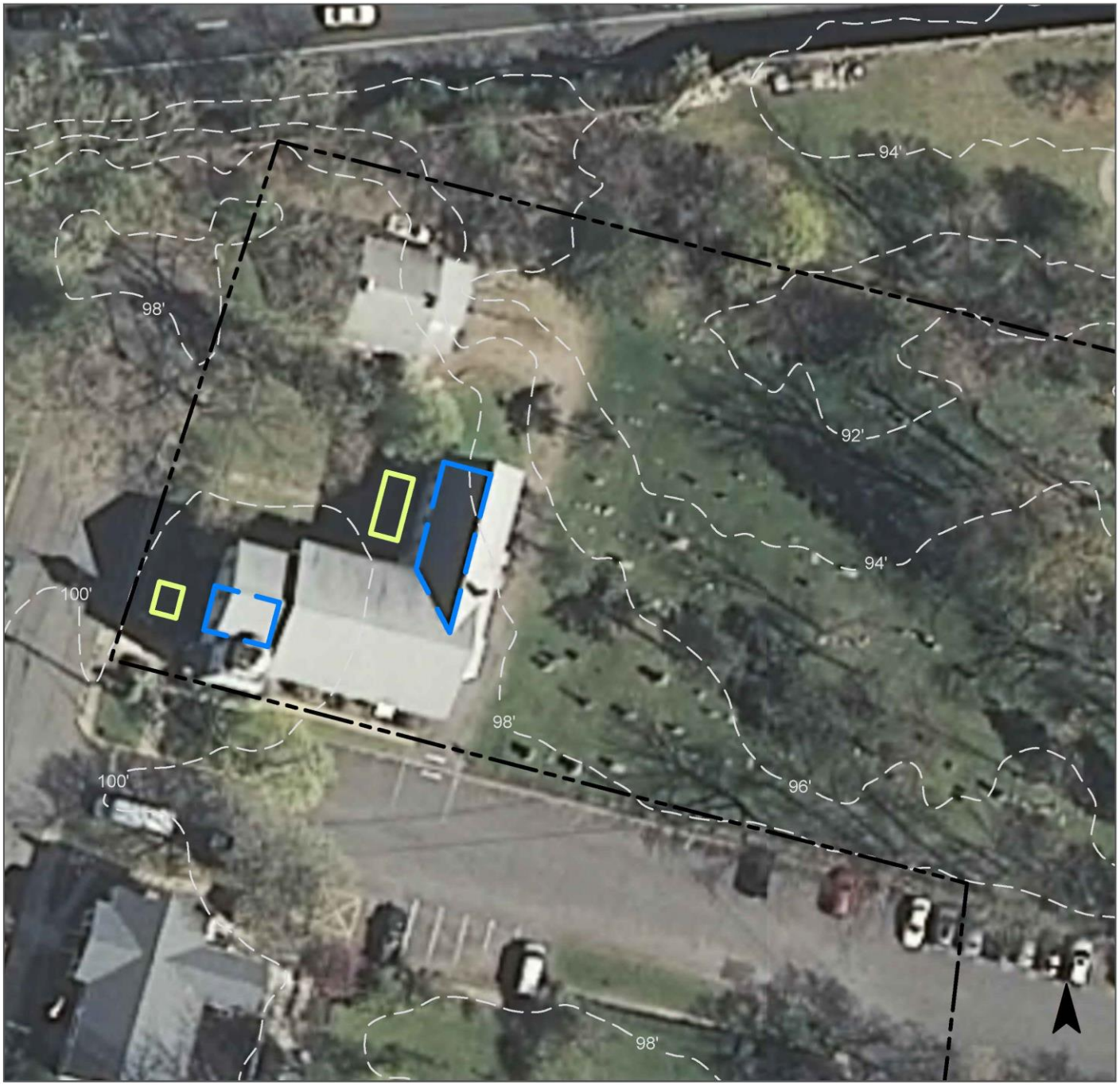
Block and Lot: Block 209, Lot 1

Rain gardens can be installed 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"
31	21,940	1.1	11.1	100.7	0.017	0.60

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	0.027	5	2,042	0.08	290	$1,450

GREEN INFRASTRUCTURE RECOMMENDATIONS



Springfield Emanuel United Methodist Church

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

0 25' 50'

TEMPLE SHA'AREY SHALOM

Subwatershed: Rahway River

Site Area: 65,516 sq. ft.

Address: 78 S. Springfield Avenue
Springfield, NJ 07081

Block and Lot: Block 1403, Lot 18

Parking spaces can be replaced with pervious pavement to capture 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"
78	50,916	2.5	25.7	233.8	0.040	1.40

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	0.372	62	28,147	1.06	9,123	$228,075

GREEN INFRASTRUCTURE RECOMMENDATIONS

Temple Sha'arey Shalom

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

0 25' 50'

THELMA L. SANDMEIER SCHOOL

Subwatershed: Rahway River

Site Area: 591,998 sq. ft.

Address: 666 S. Springfield Avenue
Springfield, NJ 07081

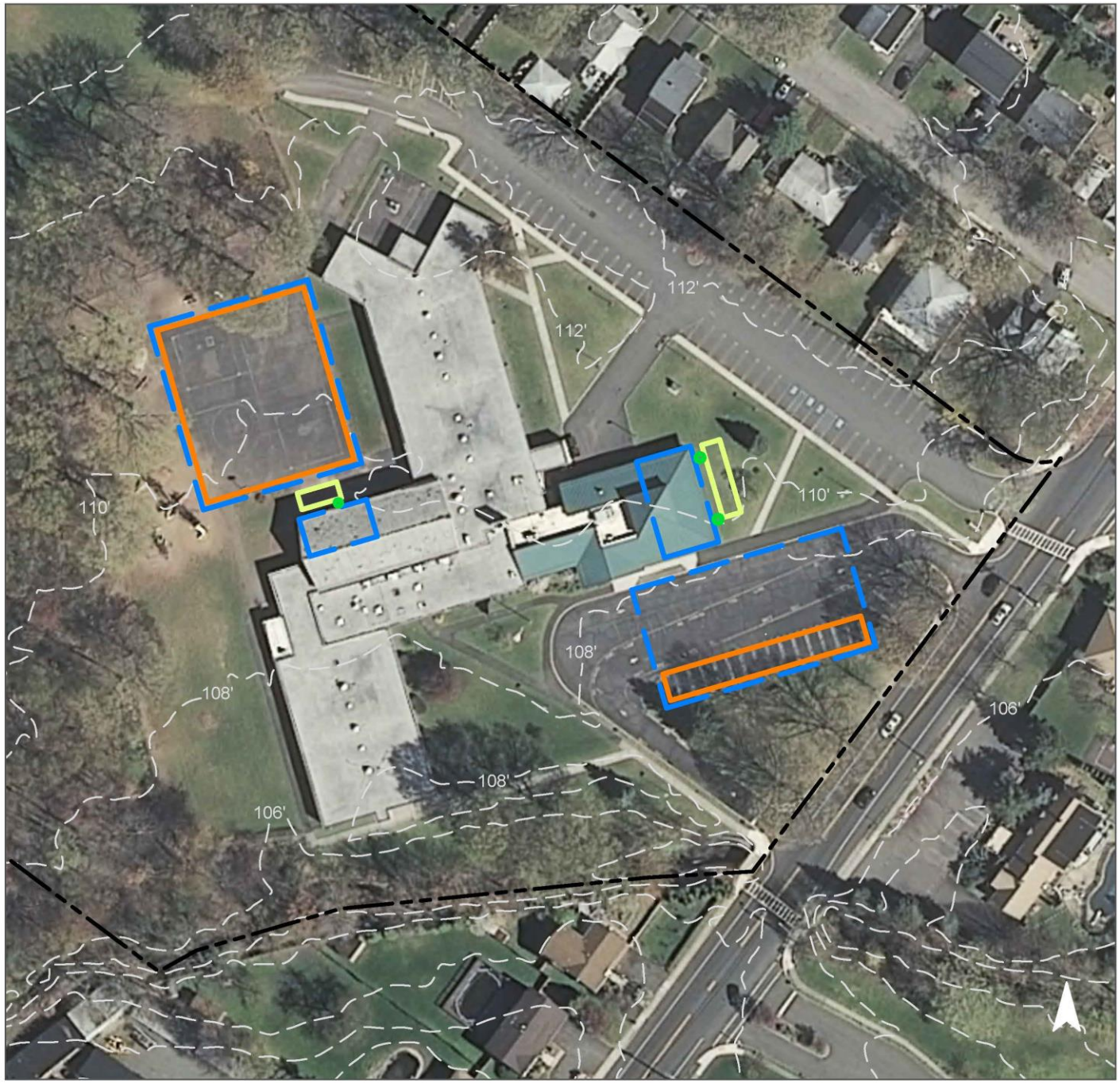
Block and Lot: Block 2901, Lot 1

Rain gardens can be built to capture, treat, and infiltrate roof runoff. Parking spaces and the play court can be converted into pervious pavement to infiltrate additional stormwater 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"
24	144,846	7.0	73.2	665.0	0.113	3.97

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	0.093	16	7,069	0.27	900	$4,500
Pervious pavement	0.607	102	45,987	1.73	14,187	$354,675

GREEN INFRASTRUCTURE RECOMMENDATIONS



Thelma L. Sandmeier School

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

0 50' 100'

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)
BALTUSROL TRIBUTARY SUBWATERSHED	**40.48**	**1,763,101**			**43.4**	**454.9**	**4,135.5**		**20.68**	**900,706**	**0.702**	**24.70**
Calvary Assembly of God												
Total Site Info	3.19	138,917	1105	25	4.3	44.9	407.9	64.0	2.04	88,845	0.069	2.44
James Caldwell Elementary School												
Total Site Info	2.60	113,228	705	7	3.3	34.6	314.1	60.4	1.57	68,419	0.053	1.88
Jonathan Dayton High School												
Total Site Info	10.56	460,030	802	2	14.5	152.1	1,383.0	65.5	6.91	301,209	0.235	8.26
Springfield Community Pool												
Total Site Info	15.33	667,714	202	23	9.2	96.4	876.7	28.6	4.38	190,945	0.149	5.24
Springfield Department of Public Works												
Total Site Info	1.52	66,374	707	10	2.5	26.4	239.9	78.7	1.20	52,258	0.041	1.43
Springfield Fire Department												
Total Site Info	0.97	42,119	1202	35	1.4	14.8	134.5	69.6	0.67	29,301	0.023	0.80
Springfield Municipal Court												
Total Site Info	0.96	42,000	711	1	1.3	13.8	125.3	65.0	0.63	27,300	0.021	0.75
Springfield Presbyterian Church												
Total Site Info	0.90	39,016	206	23	1.2	12.4	112.5	62.8	0.56	24,512	0.019	0.67
Temple Beth Ahm Yisrael												
Total Site Info	4.45	193,703	506	1	5.7	59.6	541.4	60.9	2.71	117,917	0.092	3.23
RAHWAY RIVER SUBWATERSHED	**41.57**	**1,810,588**			**35.8**	**374.7**	**3,406.1**		**17.03**	**741,846**	**0.578**	**20.35**
Congregation Israel												
Total Site Info	1.16	50,549	1801	36	1.8	19.1	174.1	75.0	0.87	37,911	0.030	1.04
Edward V. Walton School												
Total Site Info	12.79	557,293	2901	78	11.1	116.1	1,055.8	41.3	5.28	229,951	0.179	6.31

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)
Holy Cross Lutheran Church												
Total Site Info	1.65	71,810	2901	75	2.5	26.7	242.9	73.7	1.21	52,894	0.041	1.45
Raymond Chisholm Community Center												
Total Site Info	4.05	176,278	1804	6	3.3	34.4	312.9	38.7	1.56	68,148	0.053	1.87
Saint James the Apostle Parish Community												
Total Site Info	4.86	211,850	1402	6	6.3	66.1	601.2	61.8	3.01	130,939	0.102	3.59
Sarah Baily Senior & Civic Center												
Total Site Info	0.31	13,504	208	7	0.2	2.2	19.7	31.8	0.10	4,301	0.003	0.12
Springfield Emanuel United Methodist Church												
Total Site Info	1.65	71,790	209	1	1.1	11.1	100.7	30.6	0.50	21,940	0.017	0.60
Temple Sha'arey Shalom												
Total Site Info	1.50	65,516	506	1	2.5	25.7	233.8	77.7	1.17	50,916	0.040	1.40
Thelma L. Sandmeier School												
Total Site Info	13.59	591,998	2901	1	7.0	73.2	665.0	24.5	3.33	144,846	0.113	3.97

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 %
	BALTUSROL TRIBUTARY SUBWATERSHED	**255,599**	**5.87**	**6.660**	**1,115**	**447,765**	**16.93**	**100,703**			**$2,376,394**	**28.4%**
1	**Calvary Assembly of God**											
	Bioretention systems/rain gardens	5,235	0.12	0.136	23	10,337	0.39	2,205	5	SF	$11,025	5.9%
	Pervious pavements	30,380	0.70	0.792	133	4,353	0.16	9,336	25	SF	$233,400	34.2%
	Total Site Info	**35,615**	**0.82**	**0.928**	**155**	**14,690**	**0.55**	**11,541**			**$244,425**	**40.1%**
2	**James Caldwell Elementary School**											
	Pervious pavements	33,062	0.76	0.861	144	65,263	2.45	26,679	25	SF	$666,975	48.3%
	Total Site Info	**33,062**	**0.76**	**0.861**	**144**	**65,263**	**2.45**	**26,679**			**$666,975**	**48.3%**
3	**Jonathan Dayton High School**											
	Bioretention systems/rain gardens	3,050	0.07	0.079	13	6,021	0.23	810	5	SF	$4,050	1.0%
	Pervious pavements	26,023	0.60	0.678	114	51,365	1.93	12,055	25	SF	$301,375	8.6%
	Total Site Info	**29,073**	**0.67**	**0.758**	**127**	**57,386**	**2.16**	**12,865**			**$305,425**	**9.7%**
4	**Springfield Community Pool**											
	Pervious pavements	88,250	2.03	2.299	385	174,202	6.54	26,350	25	SF	$658,750	46.2%
	Total Site Info	**88,250**	**2.03**	**2.299**	**385**	**174,202**	**6.54**	**26,350**			**$658,750**	**46.2%**
5	**Springfield Department of Public Works**											
	Pervious pavements	28,286	0.65	0.737	123	55,838	2.10	9,440	25	SF	$236,000	54.1%
	Rainwater harvesting systems	1,380	0.03	0.036	6	1,290	0.10	1,290	2	gal	$2,581	2.6%
	Total Site Info	**29,666**	**0.68**	**0.773**	**129**	**57,128**	**2.20**	**10,730**			**$238,581**	**56.8%**
6	**Springfield Fire Department**											
	Pervious pavements	7,606	0.17	0.198	33	15,992	0.60	992	25	SF	$24,800	26.0%
	Rainwater harvesting systems	681	0.02	0.018	3	637	0.09	637	2	gal	$1,273	2.3%
	Total Site Info	**8,287**	**0.19**	**0.216**	**36**	**16,629**	**0.69**	**1,629**			**$26,073**	**28.3%**
7	**Springfield Municipal Court**											
	Bioretention systems/rain gardens	2,011	0.05	0.052	9	3,972	0.15	478	5	SF	$2,390	7.4%
	Pervious pavements	5,723	0.13	0.149	25	11,295	0.42	2,581	25	SF	$64,525	21.0%
	Total Site Info	**7,734**	**0.18**	**0.202**	**34**	**15,267**	**0.57**	**3,059**			**$66,915**	**28.3%**

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	**Springfield Presbyterian Church**											
	Bioretention systems/rain gardens	426	0.01	0.011	2	838	0.03	190	5	SF	$950	1.7%
	Pervious pavements	8,738	0.20	0.228	38	17,249	0.65	2,684	25	SF	$67,100	35.6%
	Total Site Info	**9,164**	**0.21**	**0.239**	**40**	**18,087**	**0.68**	**2,874**			**$68,050**	**37.4%**
9	**Temple Beth Ahm Yisrael**											
	Bioretention systems/rain gardens	4,630	0.11	0.121	20	9,141	0.34	1,160	5	SF	$5,800	3.9%
	Pervious pavements	10,118	0.23	0.264	44	19,972	0.75	3,816	25	SF	$95,400	8.6%
	Total Site Info	**14,748**	**0.34**	**0.384**	**64**	**29,113**	**1.09**	**4,976**			**$101,200**	**12.5%**
	RAHWAY RIVER SUBWATERSHED	**126,723**	**2.91**	**3.302**	**553**	**249,626**	**9.40**	**50,362**			**$1,162,528**	**17.1%**
10	**Congregation Israel**											
	Pervious pavements	6,241	0.14	0.163	27	12,320	0.46	2,415	25	SF	$60,375	16.5%
	Total Site Info	**6,241**	**0.14**	**0.163**	**27**	**12,320**	**0.46**	**2,415**			**$60,375**	**16.5%**
11	**Edward V. Walton School**											
	Bioretention systems/rain gardens	7,737	0.18	0.202	34	15,274	0.57	1,921	5	SF	$9,605	3.4%
	Pervious pavements	15,606	0.36	0.407	68	30,803	1.16	3,205	25	SF	$80,125	6.8%
	Total Site Info	**23,343**	**0.54**	**0.608**	**102**	**46,077**	**1.73**	**5,126**			**$89,730**	**10.2%**
12	**Holy Cross Lutheran Church**											
	Pervious pavements	21,733	0.50	0.566	95	42,898	1.61	6,205	25	SF	$155,125	41.1%
	Total Site Info	**21,733**	**0.50**	**0.566**	**95**	**42,898**	**1.61**	**6,205**			**$155,125**	**41.1%**
13	**Raymond Chisholm Community Center**											
	Bioretention systems/rain gardens	595	0.01	0.016	3	1,174	0.04	180	5	SF	$900	0.9%
	Pervious pavements	9,570	0.22	0.249	42	18,894	0.71	3,742	25	SF	$93,550	14.0%
	Rainwater harvesting systems	507	0.01	0.013	2	474	0.04	474	2	gal	$948	0.7%
	Total Site Info	**10,672**	**0.24**	**0.278**	**47**	**20,542**	**0.79**	**4,396**			**$95,398**	**15.7%**
14	**Saint James the Apostle Parish Community**											
	Bioretention systems/rain gardens	2,792	0.06	0.073	12	5,513	0.21	850	5	SF	$4,250	2.1%
	Pervious pavements	16,315	0.37	0.425	71	32,209	1.21	5,330	25	SF	$133,250	12.5%
	Total Site Info	**19,107**	**0.44**	**0.498**	**83**	**37,722**	**1.42**	**6,180**			**$137,500**	**14.6%**

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 %
15	**Sarah Baily Senior & Civic Center**											
	Bioretention systems/rain gardens	718	0.02	0.019	3	1,414	0.05	140	5	SF	$700	16.7%
	Pervious pavements	2,740	0.06	0.071	12	5,408	0.20	1,400	25	SF	$35,000	63.7%
	Total Site Info	**3,458**	**0.08**	**0.090**	**15**	**6,822**	**0.25**	**1,540**			**$35,700**	**80.4%**
16	**Springfield Emanuel United Methodist Church**											
	Bioretention systems/rain gardens	1,034	0.02	0.027	5	2,042	0.08	290	5	SF	$1,450	4.7%
	Total Site Info	**1,034**	**0.02**	**0.027**	**5**	**2,042**	**0.08**	**290**			**$1,450**	**4.7%**
17	**Temple Sha'arey Shalom**											
	Pervious pavements	14,260	0.33	0.372	62	28,147	1.06	9,123	25	SF	$228,075	28.0%
	Total Site Info	**14,260**	**0.33**	**0.372**	**62**	**28,147**	**1.06**	**9,123**			**$228,075**	**28.0%**
18	**Thelma L. Sandmeier School**											
	Bioretention systems/rain gardens	3,580	0.08	0.093	16	7,069	0.27	900	5	SF	$4,500	2.5%
	Pervious pavements	23,295	0.53	0.607	102	45,987	1.73	14,187	25	SF	$354,675	16.1%
	Total Site Info	**26,875**	**0.62**	**0.700**	**117**	**53,056**	**2.00**	**15,087**			**$359,175**	**18.6%**