RUTGERS
New Jersey Agricultural
Experiment Station

Impervious Cover Reduction Action Plan
for
Bloomsbury Borough, Hunterdon County, New Jersey

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

August 9, 2021

ACKNOWLEDGEMENTS:

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New Jersey Agricultural Experiment Station

NATIONAL FISH AND WILDLIFE FOUNDATION NFWF

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Introduction

Located in Hunterdon County, New Jersey, Bloomsbury Borough covers approximately 0.96 square miles. Figures 1 and 2 illustrate that Bloomsbury Borough is dominated by urban land use. A total of 41.7% of the municipality's land use is classified as urban. Of the urban land in Bloomsbury Borough, medium density residential is the dominant land use (Figure 3).

The New Jersey Department of Environmental Protection's (NJDEP) 2015 land use/land cover geographical information system (GIS) data layer categorizes Bloomsbury 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 Bloomsbury Borough. Based upon the 2015 NJDEP land use/land cover data, approximately 19.5% of Bloomsbury Borough has impervious cover. This level of impervious cover suggests that the streams in Bloomsbury Borough are likely impacted streams. [1]

Methodology

Bloomsbury Borough contains a portion of one subwatershed (Figure 4). For this impervious cover reduction action plan (RAP), projects have been identified in the one subwatershed. Aerial imagery initially was studied to identify potential project sites that contain extensive impervious cover. Field inspections were conducted to determine if viable options exist at the sites to reduce impervious cover or to disconnect impervious surfaces from draining directly to the local waterway or storm sewer system. During the field inspections, appropriate green infrastructure practices for the sites were recommended. Sites that already had green infrastructure stormwater management practices in place were not considered.

[1] Schuler, T.R., L. Fraley-McNeal, and K. Cappiella. 2009. Is Impervious Cover Still Important? Review of Recent Research. *Journal of Hydrologic Engineering* 14 (4): 309-315.

Figure 1: Map of land use in Bloomsbury Borough

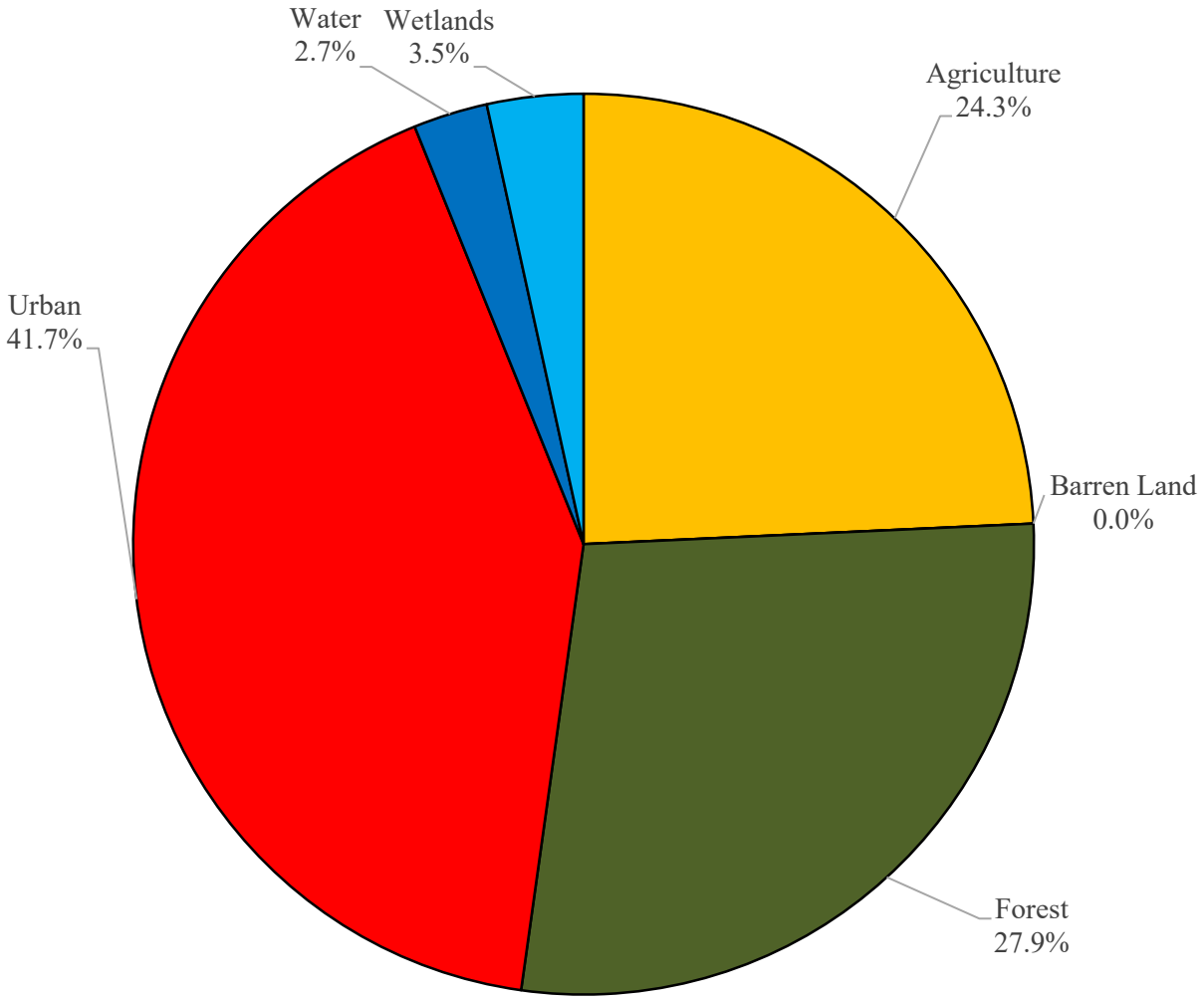


Figure 2: Pie chart illustrating the land use in Bloomsbury Borough

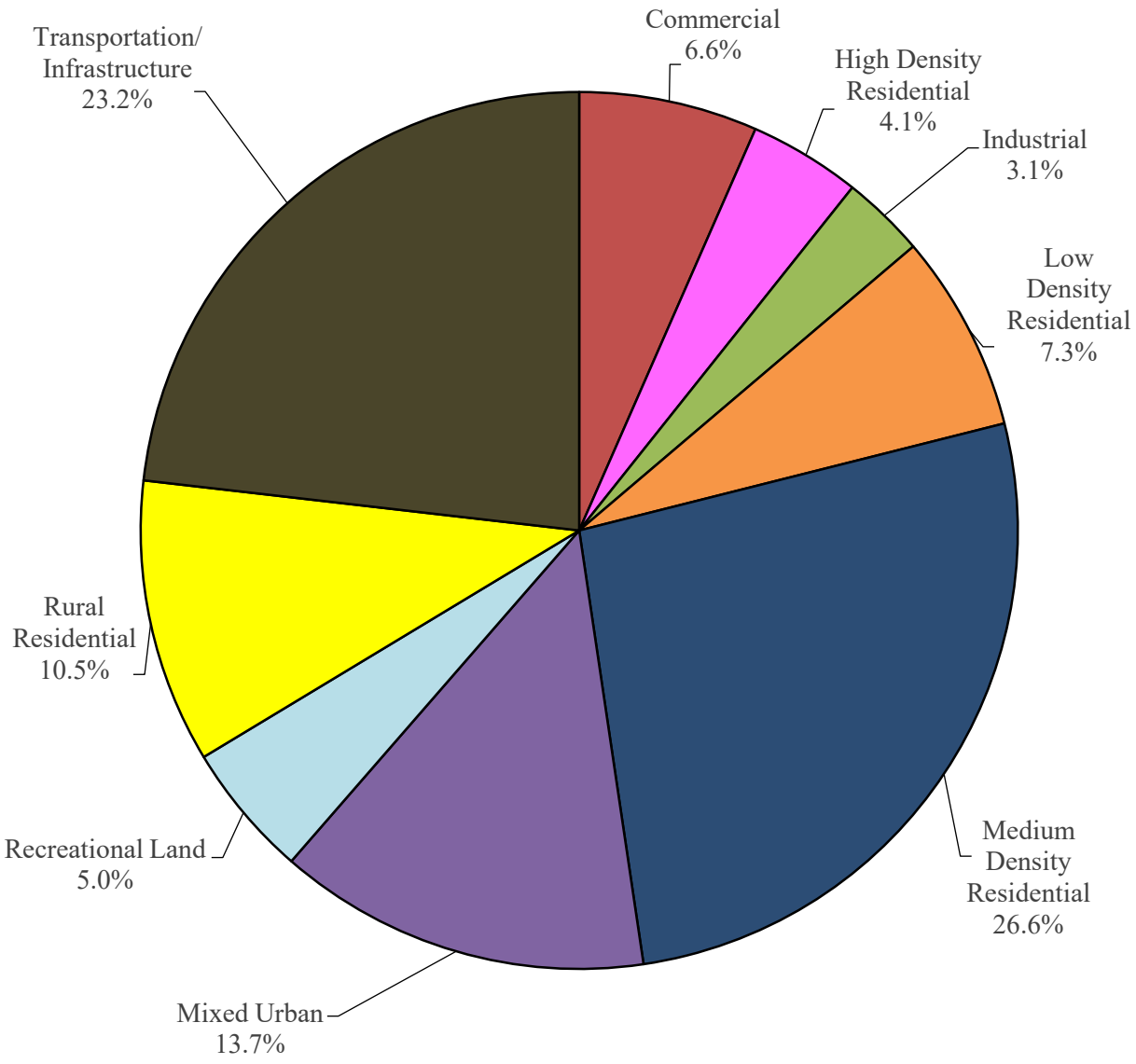


Figure 3: Pie chart illustrating the various types of urban land use in Bloomsbury Borough

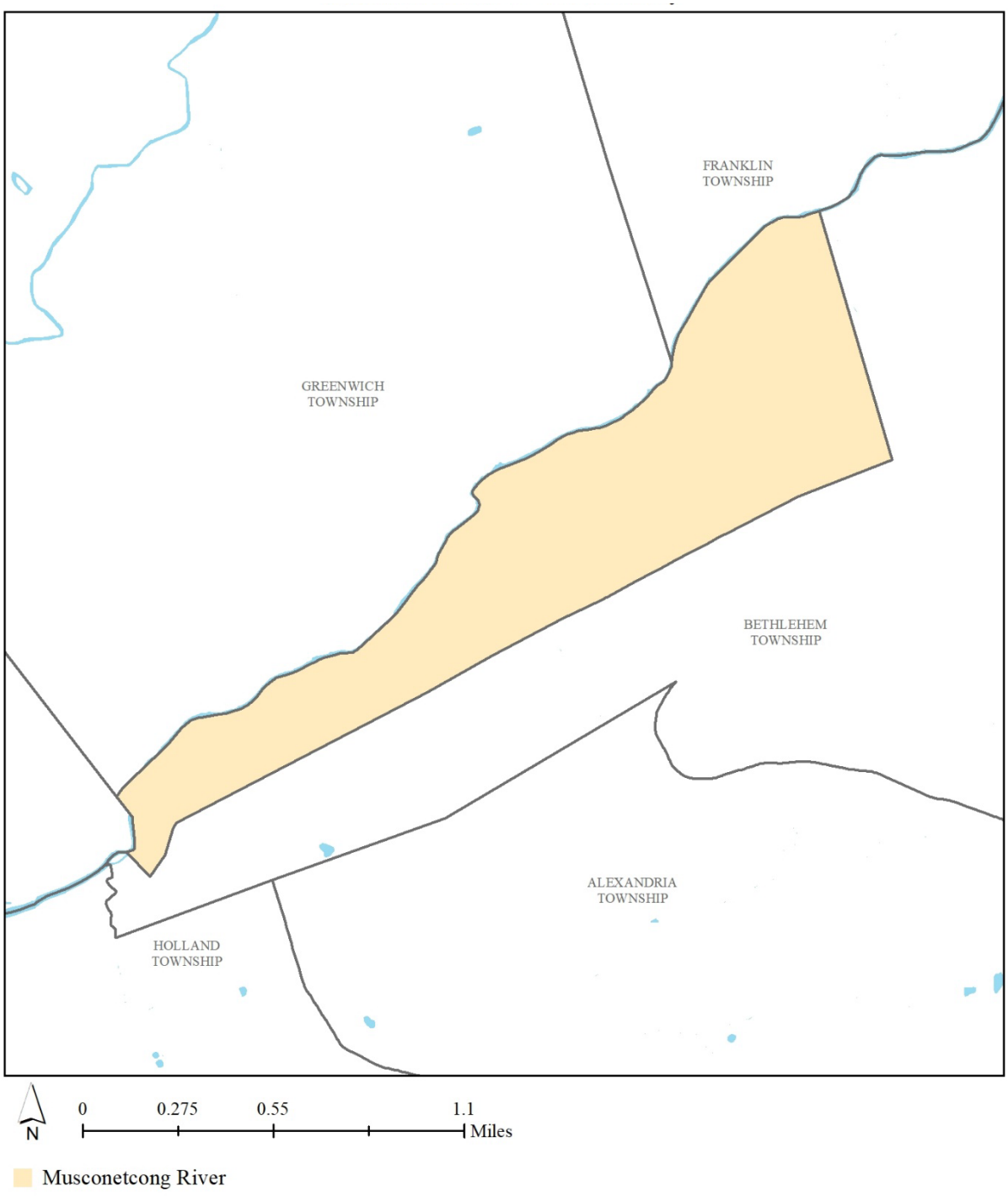


Figure 4: Map of the subwatersheds in Bloomsbury Borough

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 2015 NJDEP land use/land cover database. For impervious areas, runoff volumes were determined for the New Jersey water quality design storm (1.25 inches of rain over two hours) and for the average annual rainfall total of 44 inches.

Preliminary soil assessments were conducted for each potential project site identified in Bloomsbury 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, allowing for the capture of 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, February 2004, Page 3-11.

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 principle, 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 yield 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 Bloomsbury Borough. The practices are discussed below.

Disconnected downspouts

This is often referred to as simple disconnection. A downspout is simply disconnected 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 are designed with an underlying stone layer to retain stormwater runoff and allow it to slowly seep into the ground.




[3] United States Environmental Protection Agency (USEPA). 2015. Benefits of Green Infrastructure. http://www.epa.gov/greeninfrastructure/benefits-green-infrastructure

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 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.

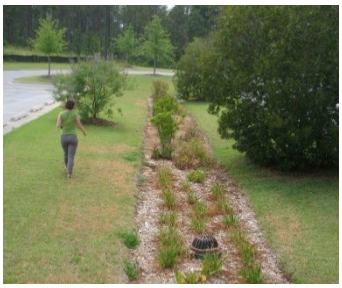
Downspout planter boxes

These are large wooden boxes that house a variety of water-retaining and/or filtering plants. When installed at the base of a downspout, water is captured by the plants which reduces stormwater runoff volume, provides a water source for the vegetation, and provides a small patch of habitat and food sources for birds and insects.

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. Bioswales are often designed for larger scale sites where water needs time to move and slowly infiltrate into the groundwater. Much like rain garden systems, bioswales can also be designed with an underdrain pipe that allows excess water to discharge to the nearest catch basin or existing stormwater system.

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. Tree filter boxes 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

Appendix A contains information on potential project sites where green infrastructure practices could be installed with a focus on existing site conditions. The recommended green infrastructure practices and the drainage area that the green infrastructure practices can treat are identified for each potential project site. For each practice, recharge potential, TSS removal potential, maximum volume reduction potential per storm, peak reduction potential, and estimated project costs are provided. This information will be especially useful in instances where proposed development projects cannot satisfy the New Jersey stormwater management requirements (N.J.A.C. 7:8).

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 through a wide variety of volunteer groups, such as Boy Scouts, Girl Scouts, Municipal Green Teams, corporate volunteerism, faith-based groups, school groups, watershed groups, and other active community organizations.

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 green infrastructure action plan into a stormwater mitigation plan and incorporate it into the municipal stormwater control ordinance.

Appendix A: Climate Resilient Green Infrastructure

a. Green Infrastructure Sites

BLOOMSBURY: GREEN INFRASTRUCTURE SITES

SITES WITHIN THE MUSCONETCONG RIVER SUBWATERSHED

1. Bloomsbury Hose Co. Station 43
2. Bloomsbury Island
3. Bloomsbury Municipal Park
4. Bloomsbury Public School
5. Bloomsbury United Methodist Church
6. Roman Catholic Church of the Annunciation
7. Farmers Insurance Gary Burdick
8. First Presbyterian Church of Bloomsbury
9. RLS Financial Services
10. Siris Pharmaceutical Services
11. USPS

b. Proposed Green Infrastructure Concepts

BLOOMSBURY HOSE CO. STATION 43

Subwatershed: MUSCONETCONG RIVER SUBWATERSHED SITES

Site Area: 19,105 sq. ft.

Address: 91 Brunswick Avenue
Bloomsbury, NJ 08804

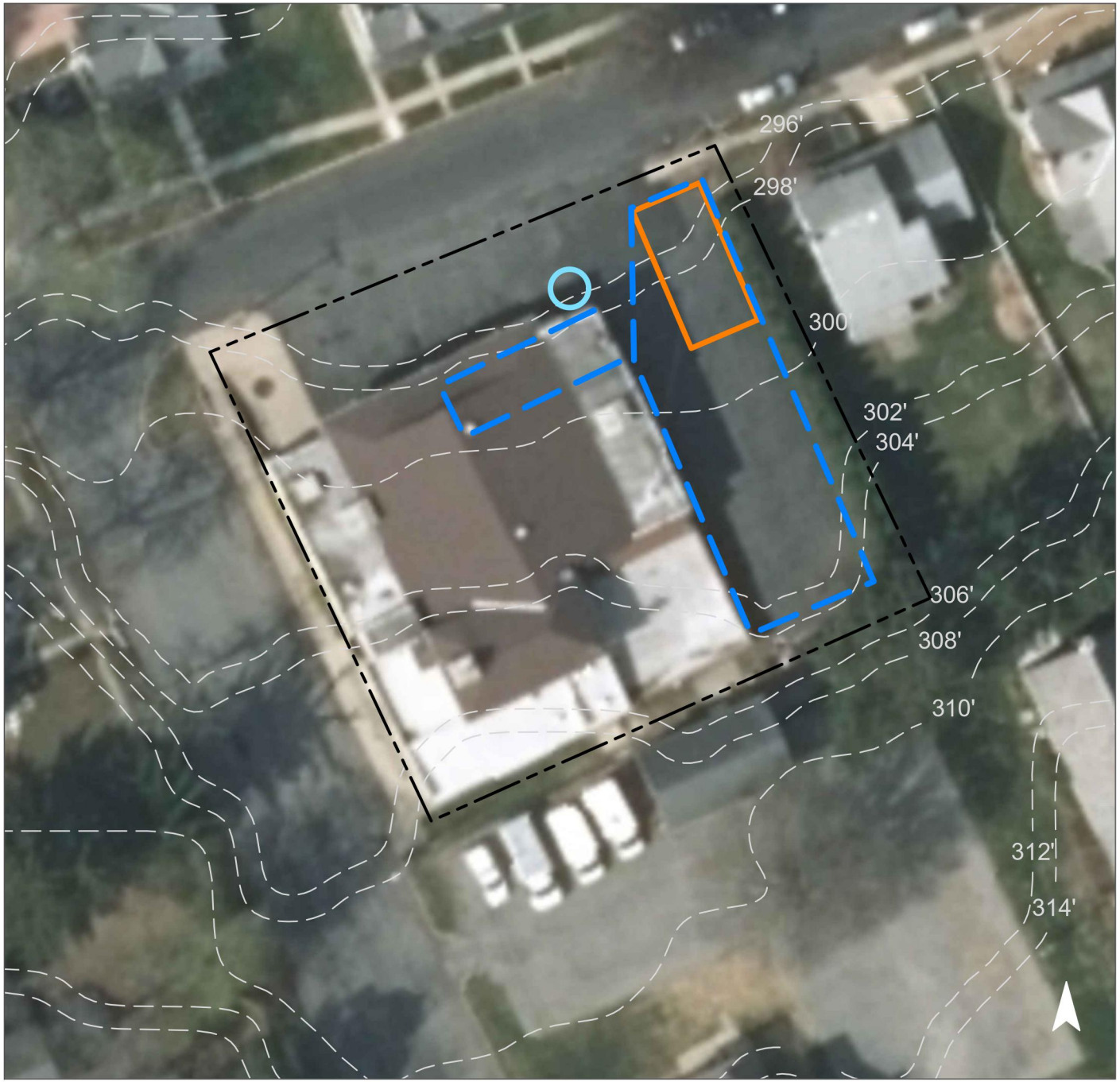
Block and Lot: Block 20, Lot 1

Parking spaces in the parking lot to the east of the building can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot and the street. A cistern can be installed northeast of the building to capture and store runoff from the rooftop to be reused for non-potable uses. 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"
88	16,875	0.8	8.5	77.5	0.013	0.46

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Pervious pavement	0.098	16	7,410	0.28	800	$20,000
Rainwater harvesting	0.018	3	500	0.02	500 (gal)	$1,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Bloomsbury Hose Co. Station 43

- pervious pavement
- rainwater harvesting
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 20' 40'

BLOOMSBURY ISLAND

Subwatershed: MUSCONETCONG RIVER SUBWATERSHED SITES

Site Area: 1,715 sq. ft.

Address: 956-960 NJ-173
Bloomsbury, NJ 08804

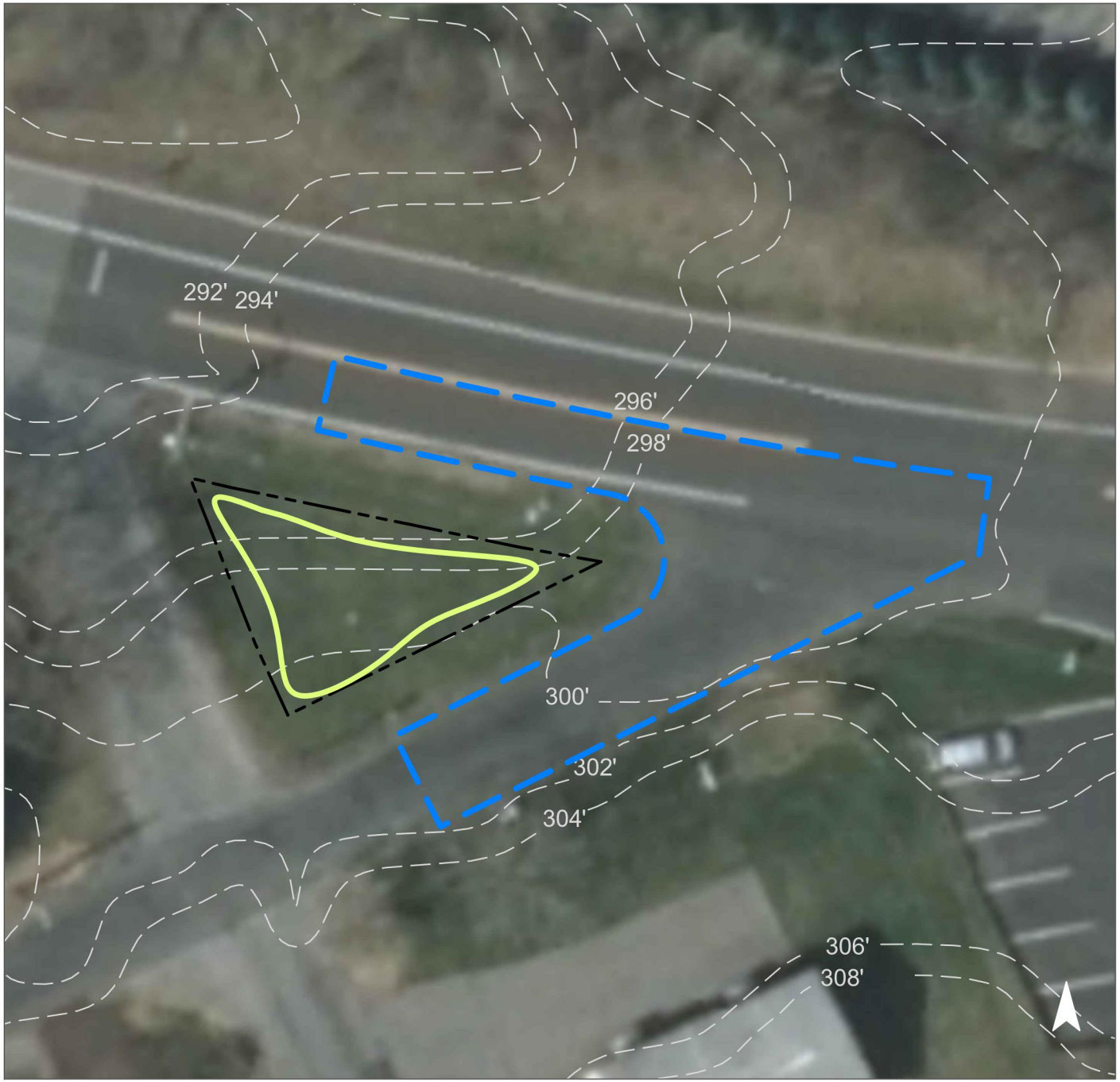
Block and Lot: Block 33, Lot 1

A rain garden can be installed inside the island to capture, treat, and infiltrate stormwater runoff from the street. 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"
45	780	0.0	0.4	3.6	0.001	0.02

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention system	0.113	19	8,590	0.32	1,090	$5,450

GREEN INFRASTRUCTURE RECOMMENDATIONS



Bloomsbury Island

- bioretention system
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 10' 20'

BLOOMSBURY MUNICIPAL PARK

Subwatershed: MUSCONETCONG RIVER SUBWATERSHED SITES

Site Area: 68,500 sq. ft.

Address: 100 County Road 579
Bloomsbury, NJ 08804

Block and Lot: Block 5, Lot 1

Parking spaces in the northeast part of the parking lot can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. A rain garden can be installed to the north of the building to capture, treat, and infiltrate stormwater runoff from the roof. 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"
52	35,695	1.7	18.0	163.9	0.028	0.98

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention system	0.020	3	1,480	0.06	190	$950
Pervious pavement	0.079	13	5,990	0.23	1,400	$35,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

Bloomsbury Municipal Park

- bioretention system
- pervious pavement
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 30' 60'

BLOOMSBURY PUBLIC SCHOOL

Subwatershed: MUSCONETCONG RIVER SUBWATERSHED SITES

Site Area: 46,115 sq. ft.

Address: 20 Main Street
Bloomsbury, NJ 08804

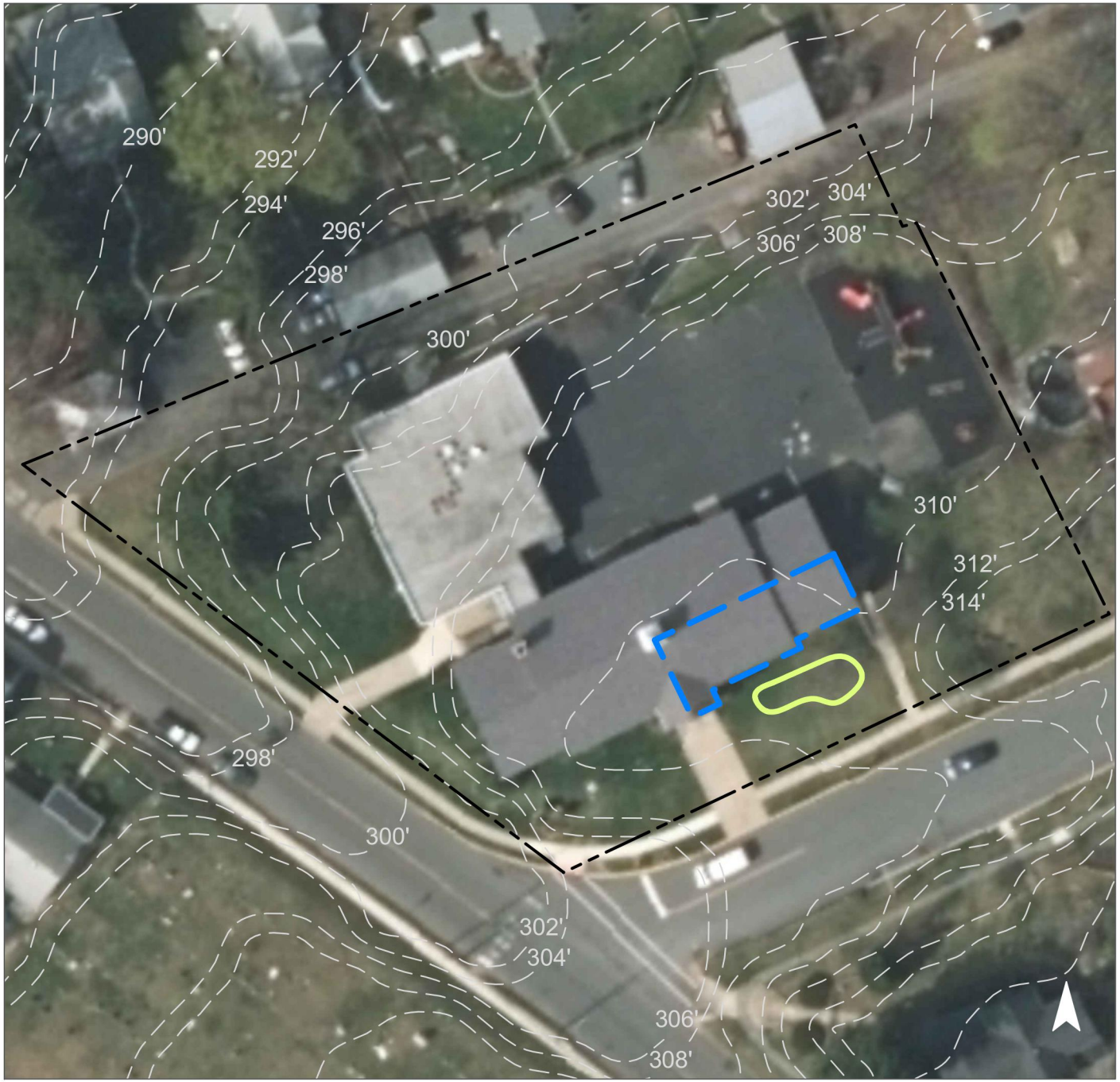
Block and Lot: Block 16, Lot 11

A rain garden can be installed in the turfgrass area south of the building to capture, treat, and infiltrate stormwater runoff from the roof. 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"
74	34,270	1.7	17.3	157.3	0.027	0.94

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 system	0.038	6	2,910	0.11	370	$1,850

GREEN INFRASTRUCTURE RECOMMENDATIONS



Bloomsbury Public School

- bioretention system
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 25' 50'

BLOOMSBURY UNITED METHODIST CHURCH

Subwatershed: MUSCONETCONG RIVER SUBWATERSHED SITES

Site Area: 46,115 sq. ft.

Address: 61 Church Street
Bloomsbury, NJ 08804

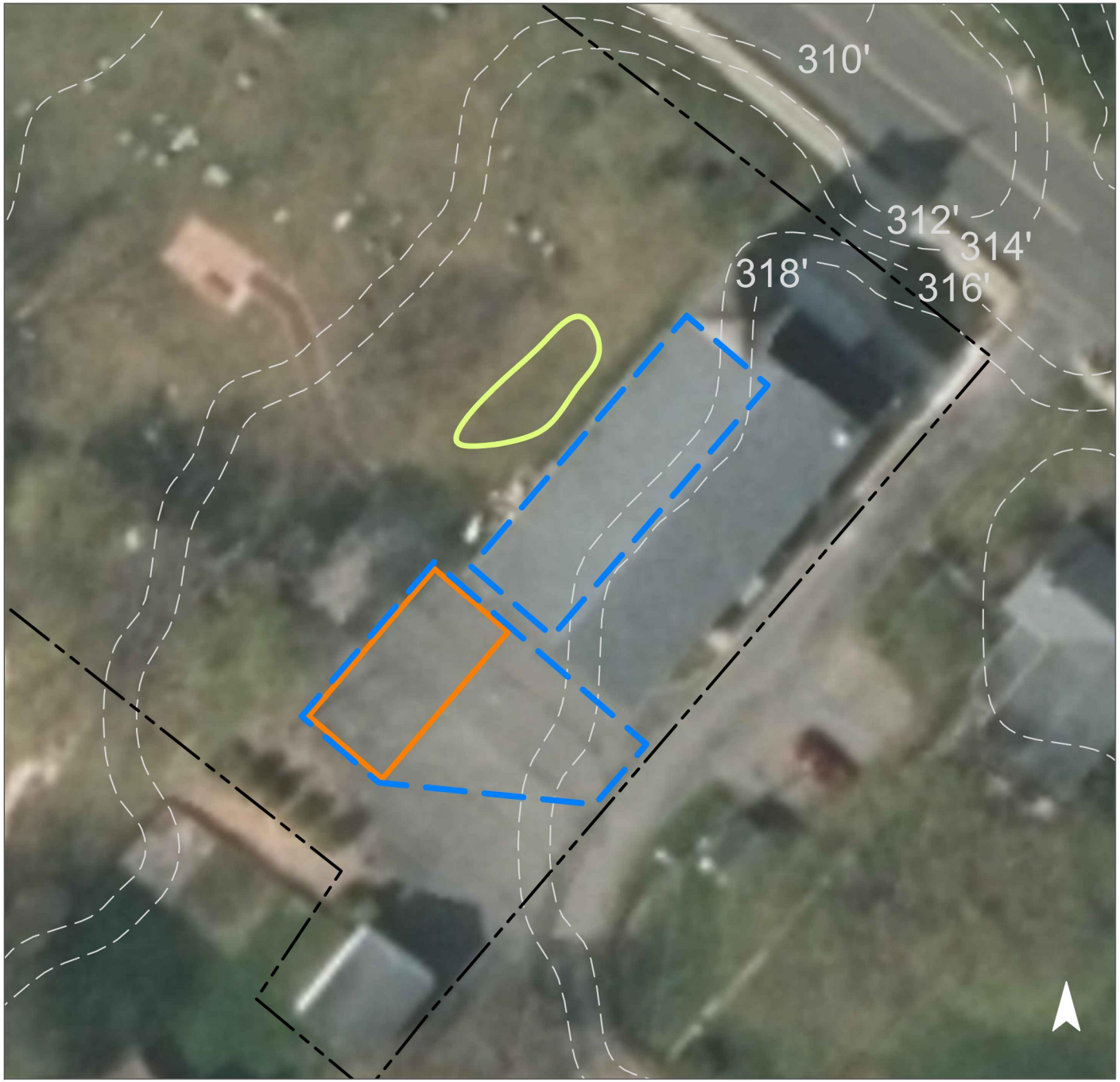
Block and Lot: Block 14, Lot 11

Parking spaces in the parking lot to the south of the building can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot and the street. A rain garden can be installed in the turfgrass area north of the building to capture, treat, and infiltrate stormwater runoff from the roof. 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"
33	14,750	0.7	7.4	67.7	0.011	0.40

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
Bioretention system	0.036	6	2,690	0.10	340	$1,700
Pervious pavement	0.046	8	3,500	0.13	800	$20,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Bloomsbury United Methodist Church

- bioretention system
- pervious pavement
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 25' 50'

ROMAN CATHOLIC CHURCH OF THE ANNUNCIATION

Subwatershed: MUSCONETCONG RIVER SUBWATERSHED SITES

Site Area: 34,450 sq. ft.

Address: 80 Main Street
Bloomsbury, NJ 08804

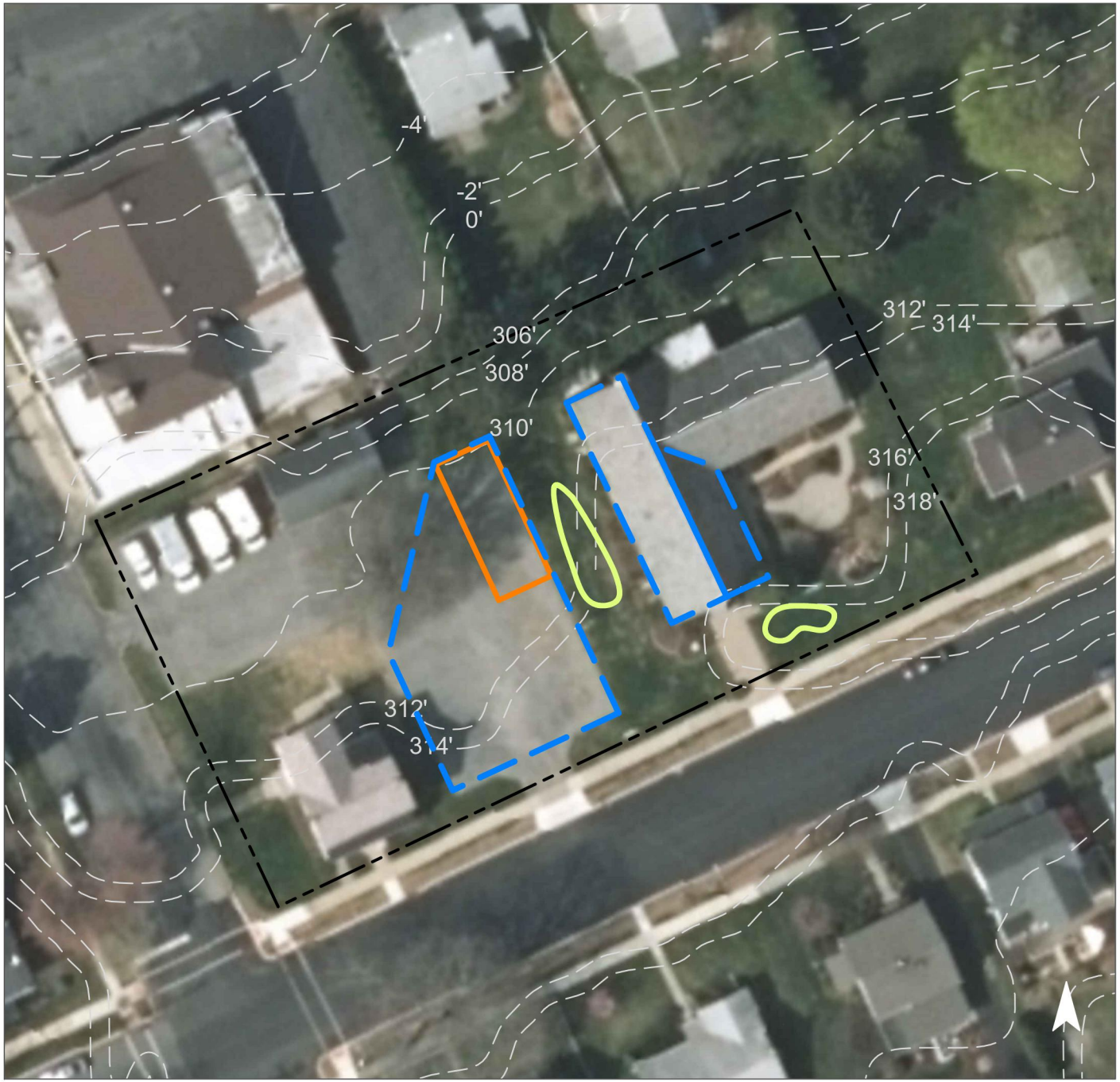
Block and Lot: Block 20, Lots 2 & 4

Parking spaces in the parking lot to the west of the building can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot and the street. Two rain gardens can be installed to the south and west of the building to capture, treat, and infiltrate stormwater runoff from the roof. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
64	22,055	1.1	11.1	101.3	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	0.060	10	4,570	0.17	580	$2,900
Pervious pavement	0.130	22	9,870	0.37	1,000	$25,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Roman Catholic Church of the Annunciation

- bioretention system
- pervious pavement
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 25' 50'

FARMERS INSURANCE - GARY BURDICK

Subwatershed: MUSCONETCONG RIVER SUBWATERSHED SITES

Site Area: 15,115 sq. ft.

Address: 962 NJ-173
Bloomsbury, NJ 08804

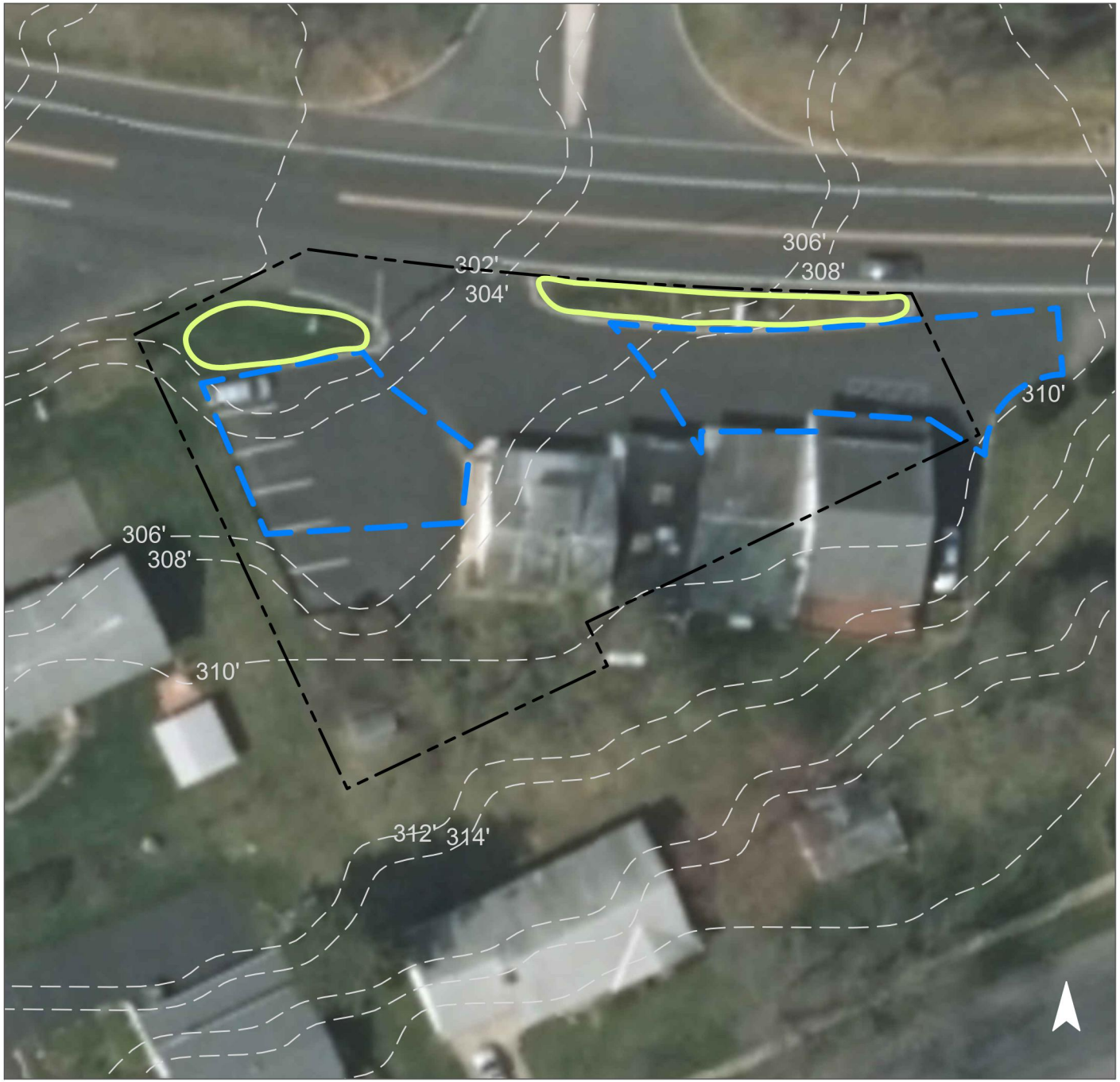
Block and Lot: Block 27, Lot 4

Two rain gardens can be installed in the turfgrass islands north of the parking lot to capture, treat, and infiltrate stormwater runoff from the parking lot. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
45	6,870	0.3	3.5	31.5	0.005	0.19

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	0.133	22	10,110	0.38	1,280	$6,400

GREEN INFRASTRUCTURE RECOMMENDATIONS



Farmers Insurance – Gary Burdick

- bioretention system
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 20' 40'

FIRST PRESBYTERIAN CHURCH OF BLOOMSBURY

Subwatershed: MUSCONETCONG RIVER SUBWATERSHED SITES

Site Area: 85,765 sq. ft.

Address: 66 Church Street
Bloomsbury, NJ 08804

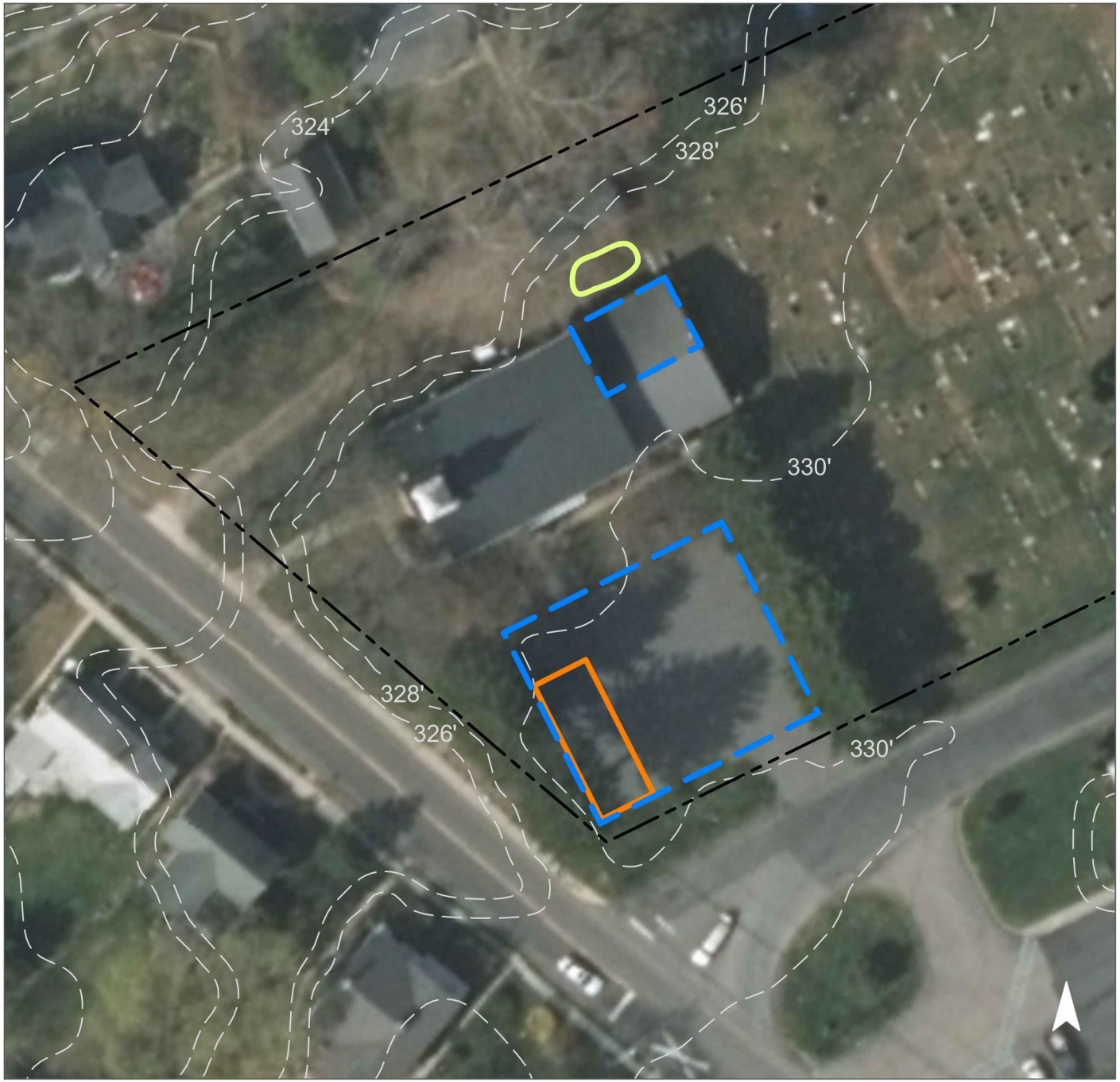
Block and Lot: Block 15, Lot 14

A rain garden can be installed in the turfgrass area north of the building to capture, treat, and infiltrate stormwater runoff from the roof. Porous pavement can be installed in the parking lot to capture, treat, and infiltrate stormwater runoff from the parking lot. 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"
27	23,130	1.1	11.7	106.2	0.018	0.63

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 system	0.023	4	1,730	0.06	220	$1,100
Pervious pavement	0.146	24	11,060	0.42	1,000	$25,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



First Presbyterian Church of Bloomsbury

- bioretention system
- pervious pavement
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 25' 50'

RLS FINANCIAL SERVICES

Subwatershed: MUSCONETCONG RIVER SUBWATERSHED SITES

Site Area: 15,110 sq. ft.

Address: 86 North Street
Bloomsbury, NJ 08804

Block and Lot: Block21, Lot 4

A rain garden can be installed in the turfgrass area west of the building to capture, treat, and infiltrate stormwater runoff from the roof. 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"
76	11,530	0.6	5.8	52.9	0.009	0.32

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 system	0.013	2	990	0.04	125	$625

GREEN INFRASTRUCTURE RECOMMENDATIONS

RLS Financial Services

- bioretention system
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 15' 30'

SIRIS PHARMACEUTICAL SERVICES

Subwatershed: MUSCONETCONG RIVER SUBWATERSHED SITES

Site Area: 52,630 sq. ft.

Address: 75 North Street
Bloomsbury, NJ 08804

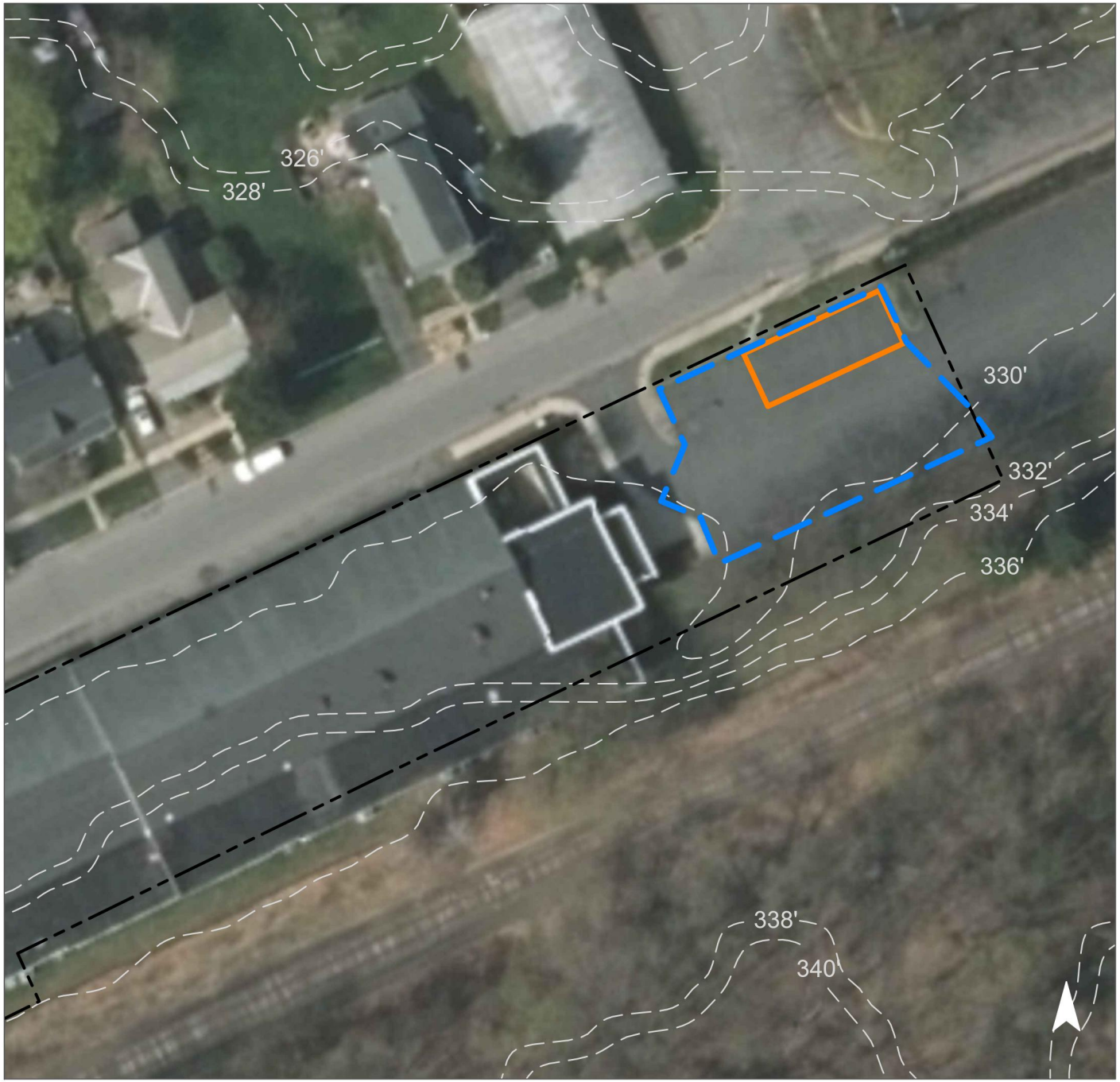
Block and Lot: Block 8, Lot 2

Parking spaces in the parking lot to the east of the building can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. 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"
77	40,565	2.0	20.5	186.2	0.032	1.11

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 pavement	0.140	23	10,590	0.40	1,000	$25,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Siris Pharmaceutical Services

- pervious pavement
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 25' 50'

USPS

Subwatershed: MUSCONETCONG RIVER SUBWATERSHED SITES

Site Area: 6,520 sq. ft.

Address: 53 Center Street
Bloomsbury, NJ 08804

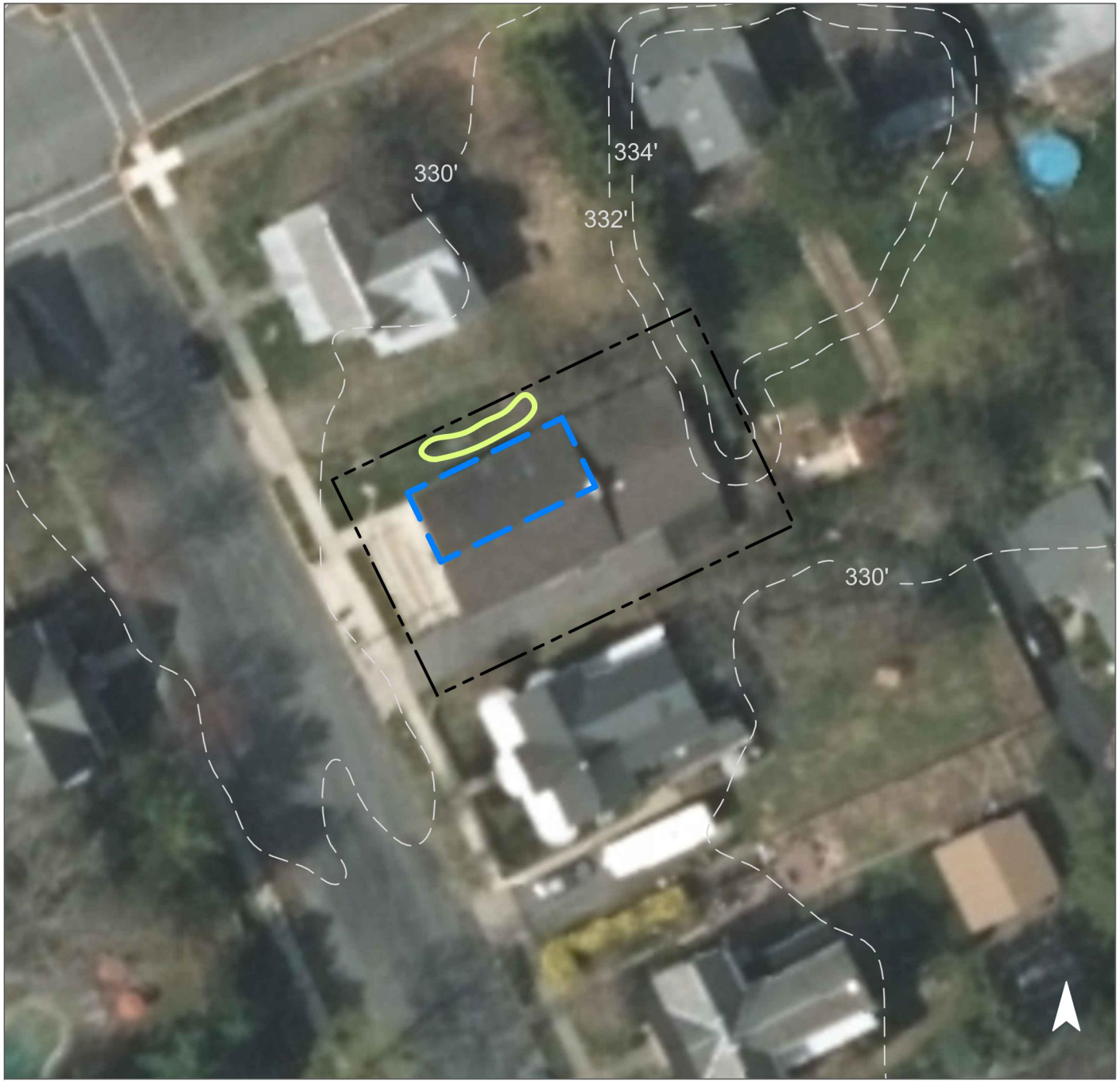
Block and Lot: Block 19, Lot 1

A rain garden can be installed in the turfgrass area north of the building to capture, treat, and infiltrate stormwater runoff from the roof. 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	3,555	0.2	1.8	16.3	0.003	0.10

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 system	0.023	4	1,780	0.07	160	$800

GREEN INFRASTRUCTURE RECOMMENDATIONS



USPS

- bioretention system
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 20' 40'

c. Summary of Existing Conditions

Summary of Existing Conditions

	Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	I.C. %	I.C. Area (ac)	I.C. Area (SF)	Existing Annual Loads (Commercial)			Runoff Volumes from I.C.		Runoff Volumes from I.C.	
									TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	Water Quality Storm (1.25" over 2-hours) (cu.ft.)	Annual (cu.ft.)	Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (Mgal)
	MUSCONETCONG RIVER SUBWATERSHED SITES	**8.79**	**389,250**				**4.82**	**210,075**	**10.1**	**106.1**	**964.5**	**21,883**	**770,275**	**0.1637**	**5.762**
1	**Bloomsbury Hose Co. Station 43**														
	Total Site Info	0.44	19,105	20	1	88	0.39	16,875	0.8	8.5	77.5	1,758	61,875	0.0131	0.463
2	**Bloomsbury Island**														
	Total Site Info	0.04	1,715	33	1	45	0.02	780	0.0	0.4	3.6	81	2,860	0.0006	0.021
3	**Bloomsbury Municipal Park**														
	Total Site Info	1.57	68,500	5	1	52	0.82	35,695	1.7	18.0	163.9	3,718	130,882	0.0278	0.979
4	**Bloomsbury Public School**														
	Total Site Info	1.06	46,115	16	11	74	0.79	34,270	1.7	17.3	157.3	3,570	125,657	0.0267	0.940
5	**Bloomsbury United Methodist Church**														
	Total Site Info	1.02	44,225	14	11	33	0.34	14,750	0.7	7.4	67.7	1,536	54,083	0.0115	0.405
6	**Roman Catholic Church of the Annunciation**														
	Total Site Info	0.79	34,450	20	4, 2	64	0.51	22,055	1.1	11.1	101.3	2,297	80,868	0.0172	0.605
7	**Farmers Insurance - Gary Burdick**														
	Total Site Info	0.35	15,115	27	4	45	0.16	6,870	0.3	3.5	31.5	716	25,190	0.0054	0.188
8	**First Presbyterian Church of Bloomsbury**														
	Total Site Info	1.97	85,765	15	14	27	0.53	23,130	1.1	11.7	106.2	2,409	84,810	0.0180	0.634
9	**RLS Financial Services**														
	Total Site Info	0.35	15,110	21	4	76	0.26	11,530	0.6	5.8	52.9	1,201	42,277	0.0090	0.316
10	**Siris Pharmaceutical Services**														
	Total Site Info	1.21	52,630	8	2	77	0.93	40,565	2.0	20.5	186.2	4,226	148,738	0.0316	1.113
11	**USPS**														
	Total Site Info	0.15	6,520	19	1	55	0.08	3,555	0.2	1.8	16.3	370	13,035	0.0028	0.098

d. 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	Unit Cost ($/unit)	Unit	Total Cost ($)	I.C. Treated %
	MUSCONETCONG RIVER SUBWATERSHED SITES	**42,850**	**0.98**	**1.116**	**187**	**83,770**	**3.16**				**$172,775**	**20%**
1	**Bloomsbury Hose Co. Station 43**											
	Pervious pavement	3,750	0.09	0.098	16	7,410	0.28	800	25	SF	$20,000	22%
	Rainwater harvesting	675	0.02	0.018	3	500	0.02	500	2	gal	$1,000	4%
	Total Site Info	**4,425**	**0.10**	**0.115**	**19**	**7,910**	**0.30**				**$21,000**	**22%**
2	**Bloomsbury Island**											
	Bioretention system	4,350	0.10	0.113	19	8,590	0.32	1,090	5	SF	$5,450	558%
	Total Site Info	**4,350**	**0.10**	**0.113**	**19**	**8,590**	**0.32**				**$5,450**	**558%**
3	**Bloomsbury Municipal Park**											
	Bioretention system	750	0.02	0.020	3	1,480	0.06	190	5	SF	$950	2%
	Pervious pavement	3,035	0.07	0.079	13	5,990	0.23	1,400	25	SF	$35,000	9%
	Total Site Info	**3,785**	**0.09**	**0.099**	**17**	**7,470**	**0.29**				**$35,950**	**11%**
4	**Bloomsbury Public School**											
	Bioretention system	1,475	0.03	0.038	6	2,910	0.11	370	5	SF	$1,850	4%
	Total Site Info	**1,475**	**0.03**	**0.038**	**6**	**2,910**	**0.11**				**$1,850**	**4%**
5	**Bloomsbury United Methodist Church**											
	Bioretention system	1,365	0.03	0.036	6	2,690	0.10	340	5	SF	$1,700	9%
	Pervious pavement	1,775	0.04	0.046	8	3,500	0.13	800	25	SF	$20,000	12%
	Total Site Info	**3,140**	**0.07**	**0.082**	**14**	**6,190**	**0.23**				**$21,700**	**21%**
6	**Roman Catholic Church of the Annunciation**											
	Bioretention systems	2,315	0.05	0.060	10	4,570	0.17	580	5	SF	$2,900	10%
	Pervious pavement	5,000	0.11	0.130	22	9,870	0.37	1,000	25	SF	$25,000	23%
	Total Site Info	**7,315**	**0.17**	**0.191**	**32**	**14,440**	**0.54**				**$27,900**	**33%**
7	**Farmers Insurance - Gary Burdick**											
	Bioretention systems	5,120	0.12	0.133	22	10,110	0.38	1,280	5	SF	$6,400	75%
	Total Site Info	**5,120**	**0.12**	**0.133**	**22**	**10,110**	**0.38**				**$6,400**	**75%**

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	Unit Cost ($/unit)	Unit	Total Cost ($)	I.C. Treated %
8	**First Presbyterian Church of Bloomsbury**											
	Bioretention system	875	0.02	0.023	4	1,730	0.06	220	5	SF	$1,100	4%
	Pervious pavement	5,600	0.13	0.146	24	11,060	0.42	1,000	25	SF	$25,000	24%
	Total Site Info	**6,475**	**0.15**	**0.169**	**28**	**12,790**	**0.48**				**$26,100**	**28%**
9	**RLS Financial Services**											
	Bioretention system	500	0.01	0.013	2	990	0.04	125	5	SF	$625	4%
	Total Site Info	**500**	**0.01**	**0.013**	**2**	**990**	**0.04**				**$625**	**4%**
10	**Siris Pharmaceutical Services**											
	Pervious pavement	5,365	0.12	0.140	23	10,590	0.40	1,000	25	SF	$25,000	13%
	Total Site Info	**5,365**	**0.12**	**0.140**	**23**	**10,590**	**0.40**				**$25,000**	**13%**
11	**USPS**											
	Bioretention system	900	0.02	0.023	4	1,780	0.07	160	5	SF	$800	25%
	Total Site Info	**900**	**0.02**	**0.023**	**4**	**1,780**	**0.07**				**$800**	**25%**