GREEN INFRASTRUCTURE FEASIBILITY STUDY

LITTLE FALLS

PASSAIC VALLEY SEWERAGE COMMISSION

"Protecting Public Health and the Environment"

RUTGERS
New Jersey Agricultural Experiment Station

ACKNOWLEDGEMENTS

This document has been prepared by the Rutgers Cooperative Extension Water Resources Program with funding and direction provided by the Passaic Valley Sewerage Commission and the New Jersey Agricultural Experiment Station. We would like to thank the Township of Little Falls for their input and support in creating this document.

"Protecting Public Health and the Environment"

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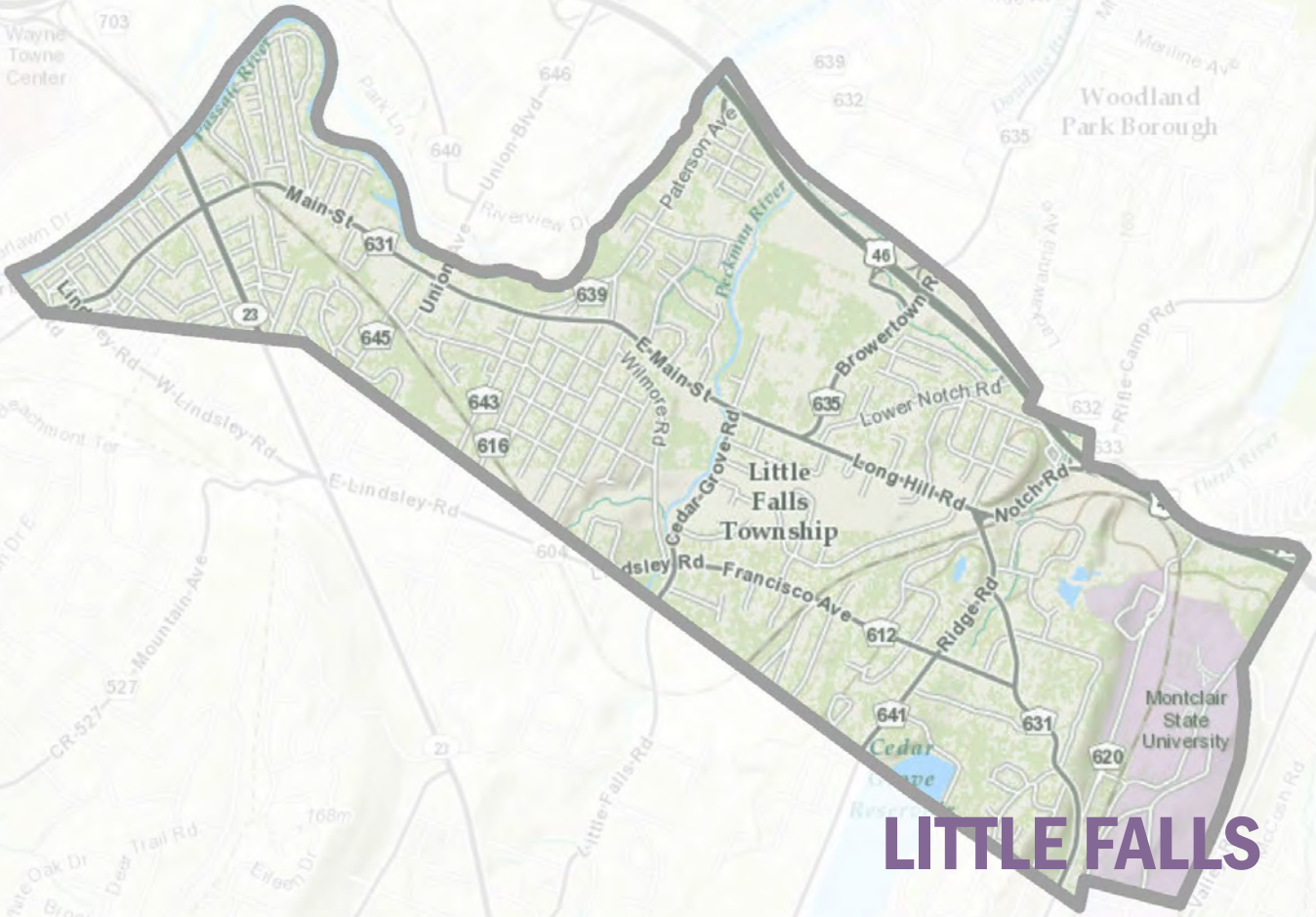
INTRODUCTION

In 2013 the Passaic Valley Sewerage Commission (PVSC) began a new initiative to assist the 48 municipalities across the five counties served by the PVSC with managing flooding and eliminating combined sewer overflows. PVSC is dedicated to leading efforts throughout the PVSC Sewerage District by using green infrastructure to intercept stormwater runoff, reduce combined sewer overflows (CSOs), manage existing water infrastructure, and minimize frequent flooding events. To help with this effort, PVSC has entered into a partnership with the Rutgers Cooperative Extension (RCE) Water Resources Program.

Little Falls is a community with a municipal separate storm sewer system (MS4), meaning stormwater and wastewater are managed in two separate sets of piping and infrastructure. When it rains, stormwater runoff causes localized flooding and contributes to downstream flooding and negative water quality impacts. By using cost-effective green infrastructure practices, Little Falls can begin to reduce the negative impacts of stormwater runoff, reduce pressures on the local infrastructure and protect the health of our waterways.

This feasibility study is intended to be used as a guide for the community of Little Falls to begin implementing green infrastructure practices and demonstrate to residents and local leaders the benefits of and opportunities for better managing

Rutgers University professor, Tobiah Horton, reviews a rain garden design with a homeowner.



Source: NJMLS


Source: Township of Little Falls


Source: Township of Little Falls

LITTLE FALLS

Little Falls is located in Passaic County and covers an area of approximately three square miles. The township has a population of 14,432 according to the 2010 US Census. The Passaic River runs along the northwest boundary of the town. The Peckman River, a tributary of the Passaic River, runs through the center of the town. The Great Notch Brook starts from the southeastern side of town and runs along the north side of the township before flowing into the Peckman River. The township has a municipal separate storm sewer system (MS4).

WHAT IS STORMWATER?

When rainfall hits the ground, it can soak into the ground or drain from the surface. When rainfall drains from a surface, it is called "stormwater" runoff. Pervious surfaces allow stormwater to readily soak into the soil and recharge groundwater. An impervious surface can be any material that has been placed over soil that prevents water from soaking into the ground. Impervious surfaces include paved roadways, parking lots, sidewalks, and rooftops. As impervious areas increase, so does the amount of stormwater runoff. New Jersey has many problems due to stormwater runoff from impervious surfaces, including:

- POLLUTION: According to the 2010 New Jersey Water Quality Assessment Report, 90% of the assessed waters in New Jersey are impaired. Urban-related stormwater runoff is listed as the most probable source of impairment (USEPA, 2013). As stormwater flows over the ground, it picks up pollutants, including animal waste, excess fertilizers, pesticides and other toxic substances. These pollutants are carried to waterways.
- FLOODING: Over the past decade, the state has seen an increase in flooding. Communities around the state have been affected by these floods. The amount of damage caused also has increased greatly with this trend, costing billions of dollars over this time span.
- EROSION: Increased stormwater runoff causes an increase in stream velocity. The increased velocity after storm events erodes stream banks and shorelines, degrading water quality. This erosion can damage local roads and bridges and cause harm to wildlife.

local reservoir


purple cone flower


pervious pavers

To protect and repair our waterways, reduce flooding, and stop erosion, stormwater runoff has to be better managed. Impervious surfaces need to be disconnected with green infrastructure to prevent stormwater runoff from flowing directly into New Jersey's waterways. Disconnection redirects runoff from paving and rooftops to pervious areas in the landscape.

A community garden that harvests and recycles rainwater

Rain barrel workshop participants

A rain garden after planting

WHAT IS GREEN INFRASTRUCTURE?

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 technologies 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 (USEPA, 2013).

GLOSSARY OF GREEN INFRASTRUCTURE TERMINOLOGY

A ***DISCONNECTED:***

Disconnected refers to channeling water from gutters and pipes that collect runoff to somewhere other than a sewer drain where it can be filtered.

B ***DEPAVING:***

Depaving is the process of removing hardscape such as asphalt or concrete.

C ***INFILTRATION:***

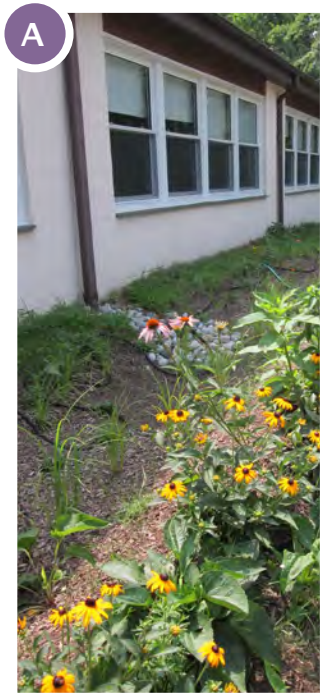
Infiltration occurs when water on the ground's surface is absorbed into the soil below. Plants promote infiltration.

D ***IMPERVIOUS SURFACE:***

An impervious surface is one that water cannot penetrate.

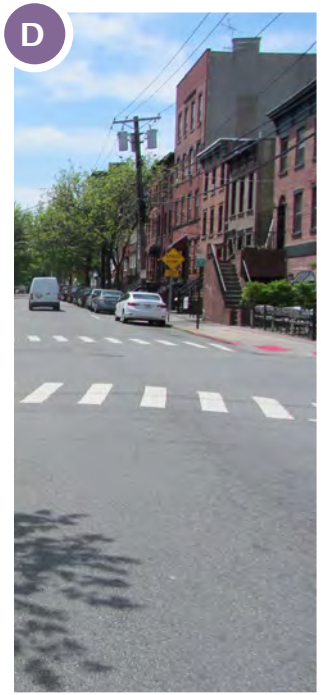
E ***RUNOFF:***

Runoff is water from precipitation that flows across land and paved surfaces before entering local waterways or sewer systems.


A


B


C
Rain Garden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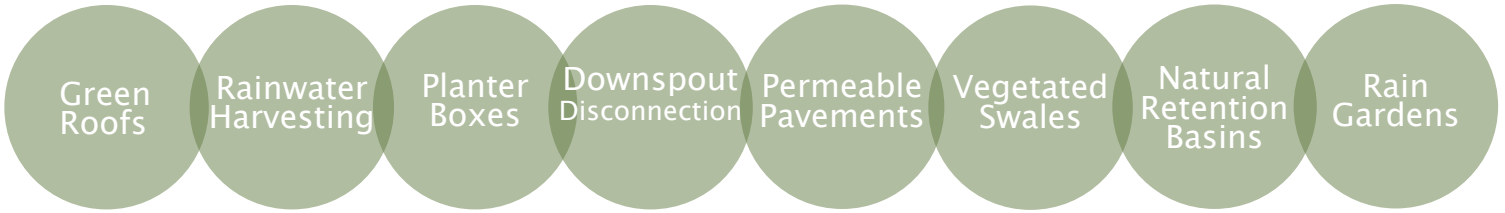
E

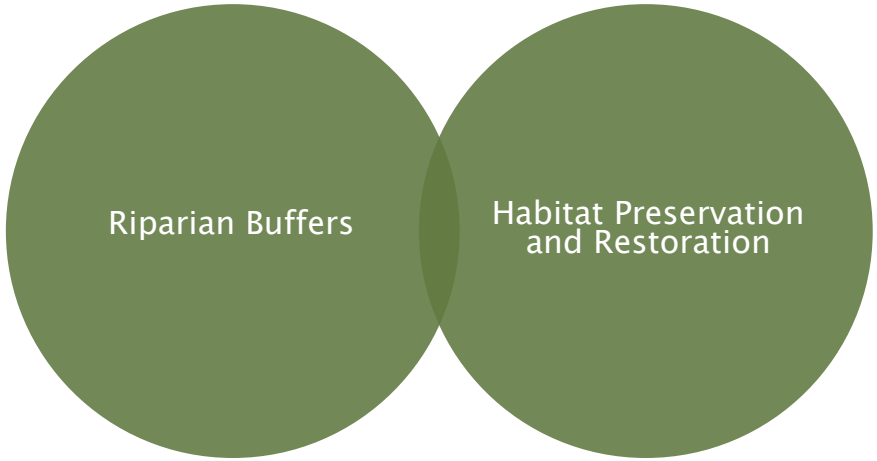
GREEN INFRASTRUCTURE STRATEGIES

SITE



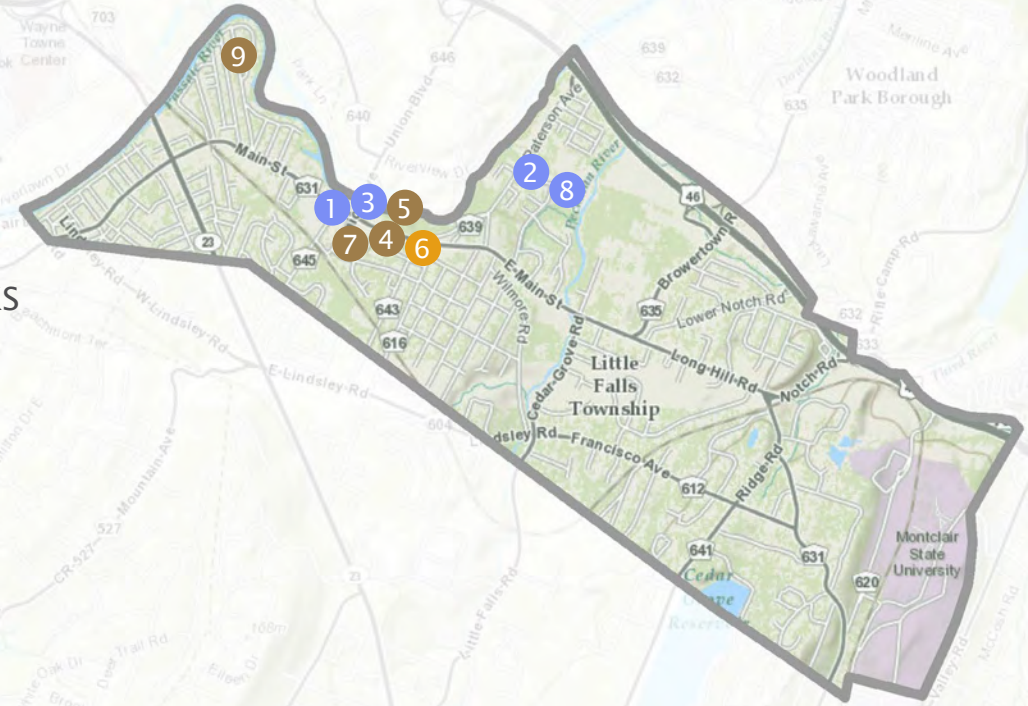
NEIGHBORHOOD

WATERSHED



POTENTIAL PROJECT SITES

1. LITTLE FALLS MUNICIPAL BUILDING
2. LITTLE FALLS RECREATION DEPARTMENT
3. LITTLE FALLS CIVIC CENTER
4. LITTLE FALLS METHODIST CHURCH
5. LITTLE FALLS PUBLIC LIBRARY
6. LITTLE FALLS PUBLIC SCHOOL NO 1
7. ST. AGNES' CHURCH
8. LITTLE FALLS DEPARTMENT OF PUBLIC WORKS
9. FLOOD MITIGATION PROPERTIES



SITE KEY

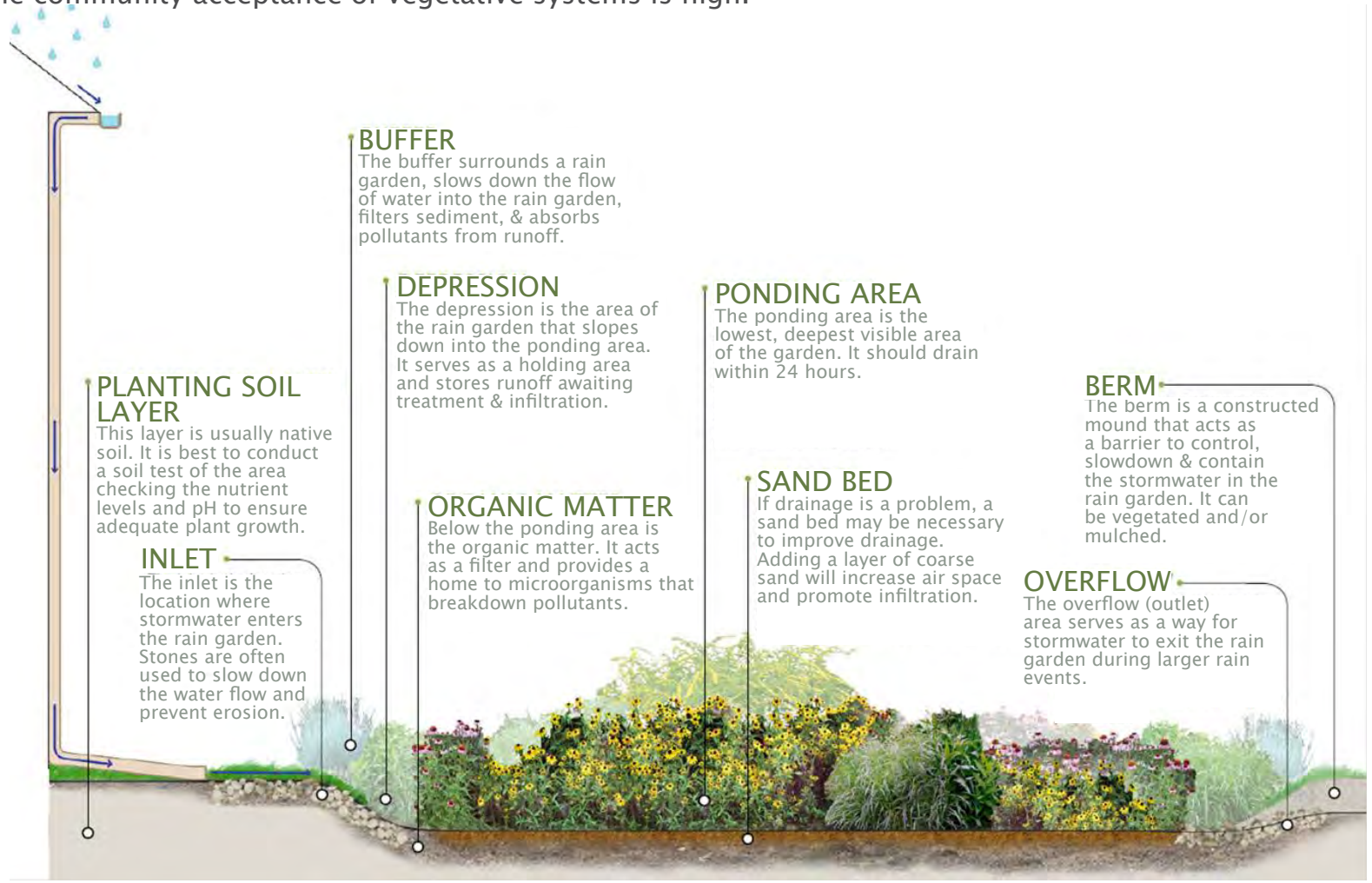
- School
- Municipal
- Other


STATE OF
NEW JERSEY
DEPARTMENT OF
ENVIRONMENTAL
PROTECTION

GREEN INFRASTRUCTURE SYSTEMS

VEGETATED SYSTEMS

Vegetative systems primarily focus on reducing water quality impacts and less on reducing flooding. These systems are typically located close to the sources of runoff and can manage the smaller storms of several inches. The main treatment mechanisms are infiltration, filtration, and evapotranspiration. These systems do an excellent job at removing total suspended solids, nutrients and pathogens. Construction costs for vegetated systems are typically low to moderate when compared to other green infrastructure practices. Since these systems often can be incorporated into existing landscapes and enhance aesthetics, the community acceptance of vegetative systems is high.



RAIN GARDEN DIAGRAM

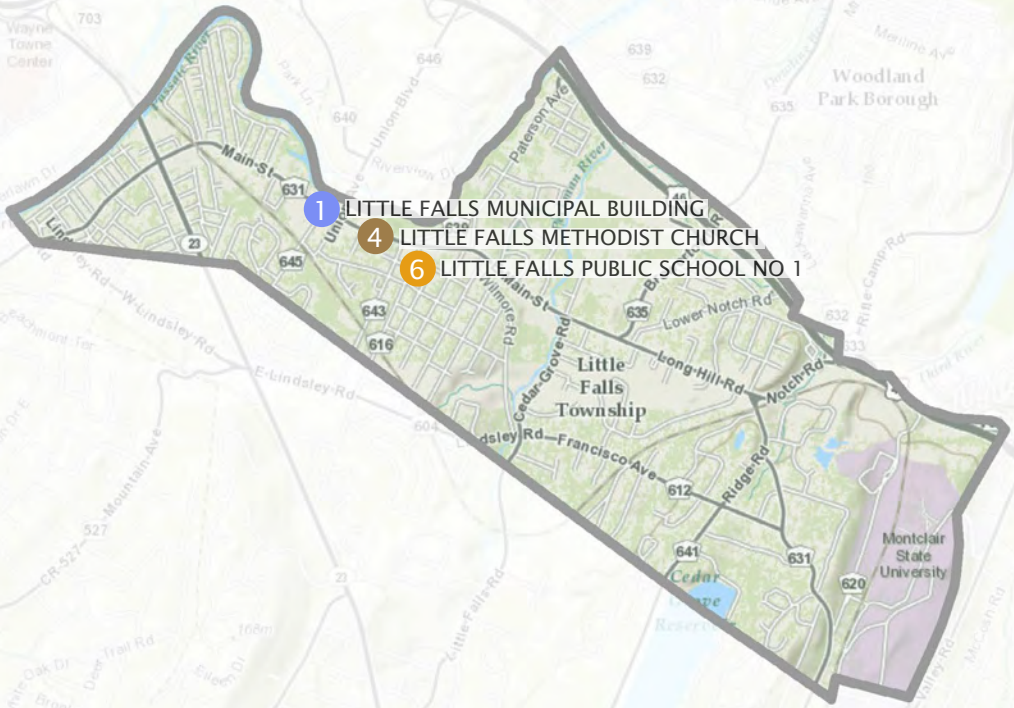
VEGETATED SYSTEM SUITABILITY

Rain gardens are shallow landscaped depressions designed to capture, treat, and infiltrate stormwater runoff. Rain gardens can be readily installed throughout a community to begin re-establishing the natural processes of the landscape. Rain gardens:

- Capture stormwater runoff, reducing soil erosion and sedimentation and the amount of water that flows to our streams and waterways during rain storms
- Protect water quality by filtering out and breaking down pollutants
- Infiltrate runoff and recharge groundwater supplies by providing base flow to nearby streams and waterways
- Enhance and increase green space and vegetated cover

Rain gardens are a simple way communities can begin to reduce stormwater runoff, manage flows to sewer systems, and protect water resources. Rain gardens can be placed in strategic locations to capture runoff from rooftops and paved areas, including:

- Homes
- Schools
- Churches
- Parking areas
- Community gardens



VEGETATED SYSTEM SUITABILITY: EXAMPLE PROJECT SITE

VEGETATED SYSTEM SUITABILITY: EXAMPLE PROJECT SITE



The example site is the Municipal Building, located at 225 Main Street. The back lot seems to slope into itself. The front of the building appears to slope from south to north and drain onto Main Street. The northwest lawn of the building is already a leach field, part of a septic tank system. Downspouts can be disconnected and directed into a rain garden, infiltrating runoff from the building's roof. The three downspouts that run down the northeast face of the building would be ideal to direct into a large rain garden.

RAINWATER HARVESTING SYSTEMS

Rainwater harvesting systems focus on the conservation, capture, storage and reuse of rain water. These systems are located close to residential and commercial buildings. Construction costs are low to moderate, depending on the size of the system, compared to other green infrastructure practices. Since these systems can be easily incorporated into the built landscape, the community acceptance of rainwater harvesting systems is moderate to high. Rainwater harvesting systems include rain barrels and cisterns.

RAIN BARREL DIAGRAM

INLET
Rainwater collected in gutters is released into the barrel here

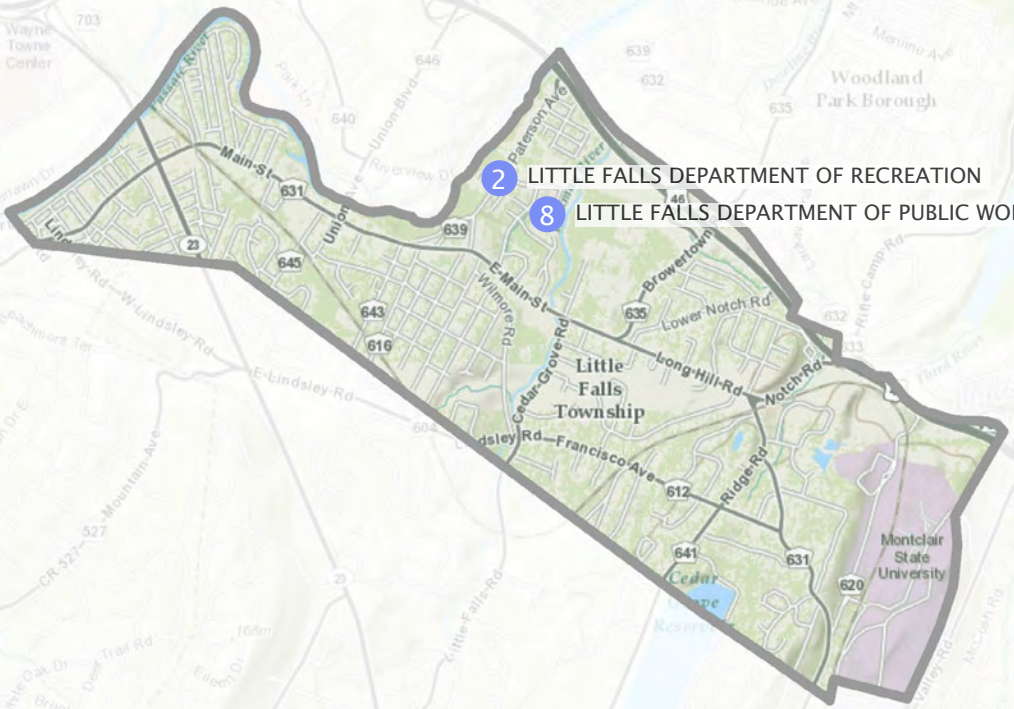
OVERFLOW OUTLET
Releases water when the rain barrel reaches capactiy

SPIGOT
Valve that opens and closes barrel's water flow

RAINWATER HARVESTING SYSTEMS SUITABILITY

Typical rainwater harvesting systems can store up to 5,000 gallons of water. Harvesting during the rainy months of spring and summer provides a source of water during hot and dry periods between rain storms. Instead of using potable water, residents can save money using the rainwater stored in a rain barrel or cistern. This also reduces the demand on drinking water supplies and related infrastructure.

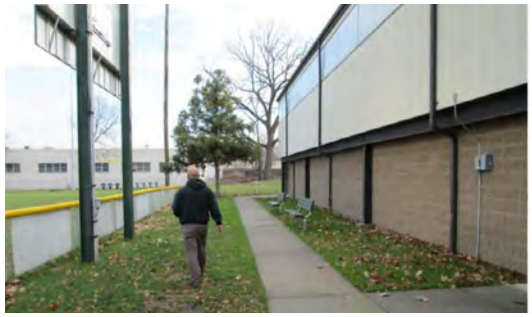
Rain barrels and cisterns are an effective rainwater harvesting tool and can be an important element in a community-wide green infrastructure program. For every inch of rain that falls on an eight hundred square foot roof (20' x 40'), nearly 500 gallons of water can be collected. Over an entire year, water running off of this rooftop will total over 20,000 gallons. This sustainable practice reduces the impact a building has on the environment by harvesting stormwater runoff from rooftops, decreasing flow to sewer systems. Rain barrels and cisterns provide an alternative source of water for gardens, lawns, and landscaping by reducing the use of potable water supplies.



RAINWATER HARVESTING SYSTEM SUITABILITY: EXAMPLE PROJECT SITE

150 Paterson Avenue
Little Falls, NJ 07424

RAINWATER HARVESTING SYSTEM SUITABILITY: EXAMPLE PROJECT SITE



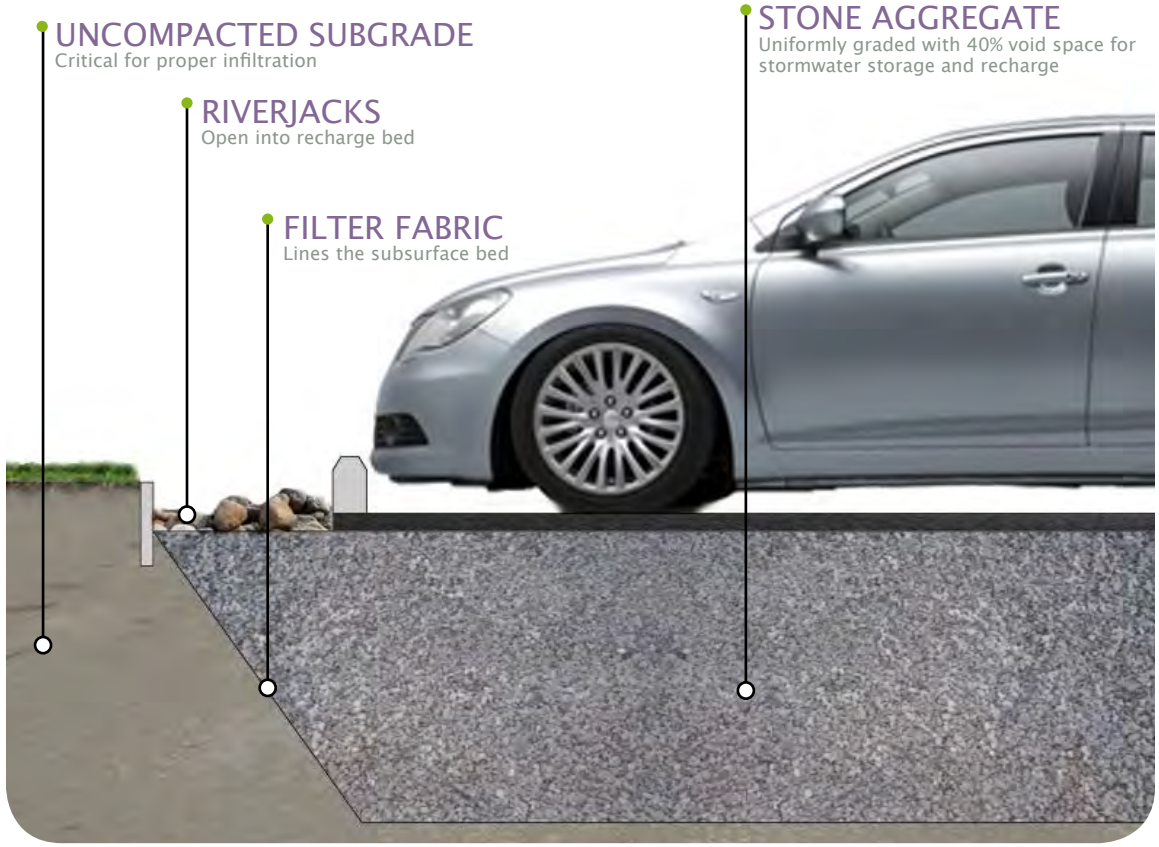
The site is Little Falls Recreation Department located at 150 Paterson Avenue. The site already has pavers to the west on the front side of the building. There are downspouts on the building that are sloped to the field on the north of the building. A bioswale could possibly be implemented here to control the runoff of water. The parking lot is in poor condition, and it could be repaved using pervious pavement. It is possible to harvest roof runoff in cisterns to help irrigate the fields to replace or supplement the use of potable water.

STORAGE, QUANTITY, & INFILTRATION SYSTEMS

Storage, quantity, and infiltration systems primarily focus on storage. These systems are typically located close to runoff sources within residential, commercial and industrial landscapes. The main treatment mechanism is reducing peak flows of stormwater by storing it before it becomes runoff. Construction costs for storage, quantity, and infiltration are moderate to high when compared to other green infrastructure practices because they require more space and infrastructure and are more laborious to install. Since these systems can be seamlessly incorporated into the built environment and can manage a large quantity of water, the community acceptance of storage, quantity, and infiltration systems is high.

PERMEABLE PAVEMENT

- Underlying stone reservoir
- Porous asphalt and pervious concrete are manufactured without “fine” materials to allow infiltration
- Grass pavers are concrete interlocking blocks with open areas to allow grass to grow
- Ideal application for porous pavement is to treat a low traffic or overflow parking area



PERMEABLE PAVEMENT DIAGRAM

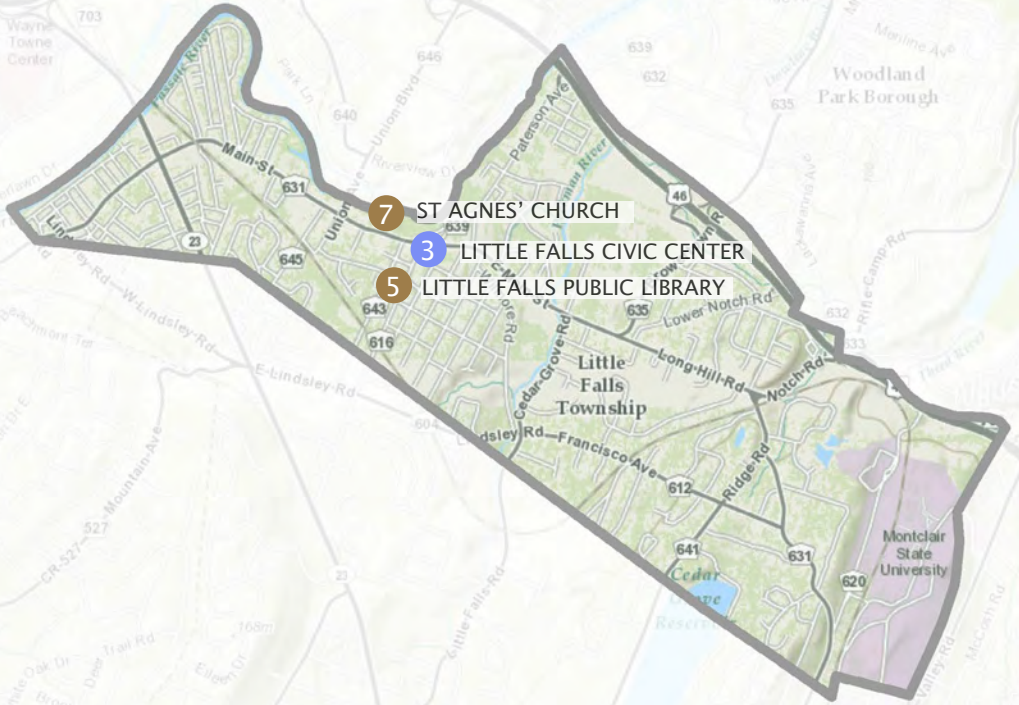
STORAGE, QUANTITY, & INFILTRATION SYSTEM SUITABILITY

Pervious paving systems are paved areas that produce less stormwater runoff than areas paved with conventional paving. These systems include:

- Permeable pavers
- Porous asphalt
- Pervious concrete

The paving material is placed over a bed of uniformly graded stone. The paving materials allow water to pass through and then infiltrate into the pore spaces of the underlying stone bed. The stored runoff then infiltrates over time into the uncompacted subgrade soils.

Stormwater planters are small, contained vegetated systems that collect and treat stormwater using a prepared soil media and mulch. These systems serve as small bioretention facilities filtering stormwater through layers of mulch, soil and plant root systems. Treated stormwater can then be infiltrated into existing surrounding soils as groundwater (infiltration planter) or, if infiltration is not appropriate, drainage pipes can discharge filtered stormwater into traditional storm sewer infrastructure (flow-through planter).



STORAGE, QUANTITY, & INFILTRATION SYSTEM SUITABILITY: EXAMPLE PROJECT SITE

STORAGE, QUANTITY, & INFILTRATION SYSTEM SUITABILITY: EXAMPLE PROJECT SITE

The site is Little Falls Civic Center, located at 19 Warren Street. The site slopes from southeast to northwest and drains onto Warren St. There is a parking-lot to the east of the main building that is in poor condition and could be repaved with pervious pavement. The grassy area is suitable for a bioswale to slow the runoff on the northeast side .

FEMA & COMMUNITY RATING SYSTEMS (CRS)

The Community Rating System (CRS) is a national program developed by the Federal Emergency Management Agency (FEMA). The National Flood Insurance Program (NFIP) provides federally backed flood insuance within communities that enact and enforce floodplain regulations. According to the Environmental Protection Agency, a floodplain refers to the lowland areas adjoining inland and coastal waters including areas subject to a 1% or greater chance of flooding in any given year. Under the CRS, the flood insurance premiums of a community's residents and businesses are discounted to reflect that communitiy's work to reduce flood damage to community assets.

CRS Class Table

- Little Falls is a Class 9 community
- Homeowners inside and outside the FEMA designated Special Flood Hazard Area save 5% on their flood insurance
- CRS communities can increase their credit points by implementing a Floodplain Management Plan

Table 110-1. CRS classes, credit points, and premium discounts.

CRS Class	Credit Points (cT)	Premium Reduction	
		In SFHA	Outside SFHA
1	4,500+	45%	10%
2	4,000–4,499	40%	10%
3	3,500–3,999	35%	10%
4	3,000–3,499	30%	10%
5	2,500–2,999	25%	10%
6	2,000–2,499	20%	10%
7	1,500–1,999	15%	5%
8	1,000–1,499	10%	5%
9	500–999	5%	5%
10	0–499	0	0

SFHA: Zones A, AE, A1–A30, V, V1–V30, AO, and AH

Outside the SFHA: Zones X, B, C, A99, AR, and D

Preferred Risk Policies are not eligible for CRS premium discounts because they already have premiums lower than other policies. Preferred Risk Policies are available only in B, C, and X Zones for properties that are shown to have a minimal risk of flood damage.

Some minus-rated policies may not be eligible for CRS premium discounts.

Premium discounts are subject to change.

FEMA CRS COORDINATOR'S MANUAL 2013

FEMA & COMMUNITY RATING SYSTEMS (CRS) SUITABILITY

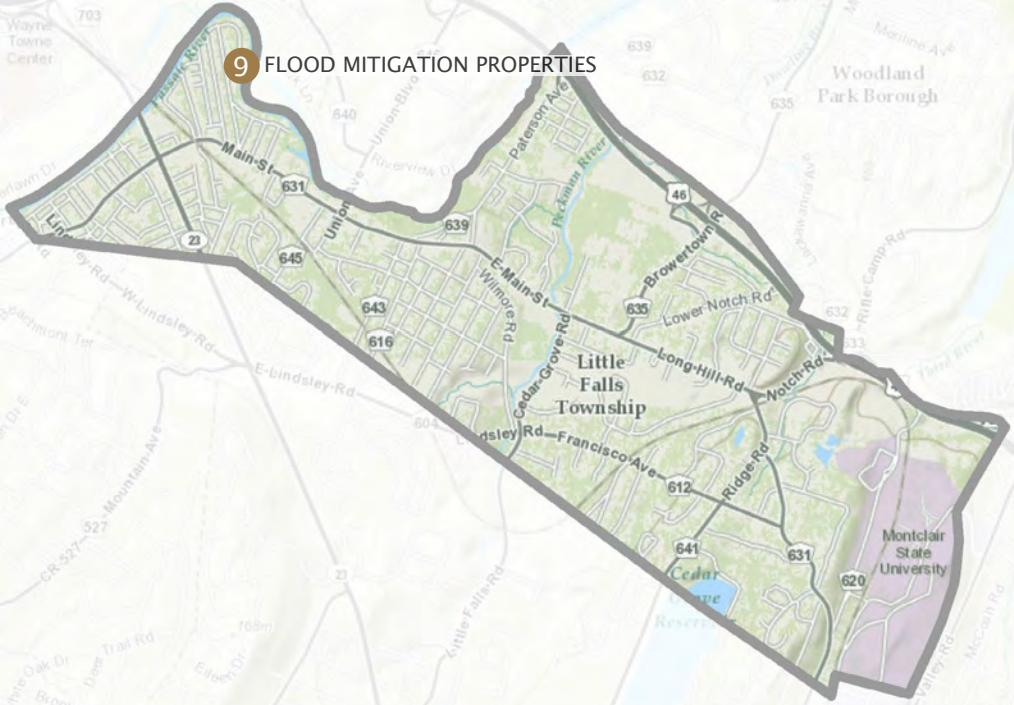
Little Falls has been a participating member of the National Flood Insurance Program since 2007 and rated a Class 9 CRS community since 2010. The CRS program has the following stated goals:

- Reduce and avoid flood damage to insurable property
- Strengthen and support the insurance aspects of the NFIP
- Foster comprehensive floodplain management

Credit Points are awarded by the adoption and implementation of the following:

- Public Information – Flood protection information, outreach projects
- Mapping & Regulations – Open space preservation, stormwater management
- Flood Damage Reduction – Aquisition and relocation, drainage system maintenance
- Warning & Response Systems

Little Falls adopted an *All Hazard Mitigation Plan* in 2008 that suggested that 90 floodplain properties undergo elevation or acquisition for open space. Funding for this recommendation was received through FEMA mitigation and New Jersey Department of Environmental Protection (NJDEP) Blue Acres grants.



FEMA & COMMUNITY RATING SYSTEMS SUITABILITY: EXAMPLE PROJECT SITES

FEMA & COMMUNITY RATING SYSTEMS SUITABILITY: EXAMPLE PROJECT SITES

Many of these properties are in the process of being demolished or elevated to withstand flooding. Pre-existing stormwater management is limited to an outflow pipe that discharges directly into the river and two pump stations. Contiguous sites in the floodplain could be converted into a vegetated buffer, while isolated sites could manage stormwater through rain gardens, depaving, and bioswales. There is an opportunity to create a green-way or network of open park space for the community.

SUITABLE GREEN INFRASTRUCTURE STRATEGIES:

- [x] rain gardens
- [ ] curb cuts
- [x] stormwater planters
- [ ] rain barrels
- [x] buffers
- [ ] cisterns
- [x] pervious pavement
- [x] bioswales
- [x] depaving


TREE
PLANTING

COMMUNITY ENGAGEMENT & EDUCATION

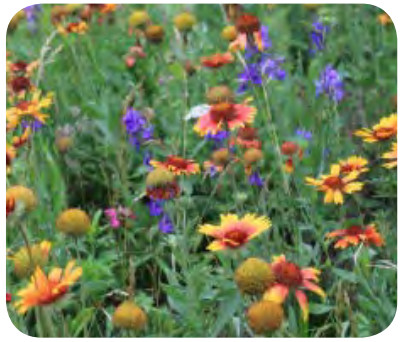
BUILD A RAIN BARREL WORKSHOP

With the Build a Rain Barrel Workshop, community members participate in a short presentation on stormwater management and water conservation and then learn how to build their own rain barrel. Workshop participants work with trained experts to convert 55 gallon plastic food-grade drums into rain barrels. They are quickly able to take an active role in recycling rainwater by installing a rain barrel at their house! Harvesting rainwater has many benefits including saving water, saving money, and preventing basement flooding. By collecting rainwater, homeowners are helping to reduce flooding and pollution in local waterways. When rainwater drains from hard surfaces like rooftops, driveways, roadways, parking lots, and compacted lawns, it carries pollution to our local waterways. Harvesting the rainwater in a rain barrel is just one of the ways homeowners can reduce rainwater from draining from their property and help reduce neighborhood flooding problems.

STORMWATER MANAGEMENT IN YOUR SCHOOLYARD

The *Stormwater Management in Your Schoolyard* program provides educational lectures, hands-on activities, and community-level outreach for students on the topics of water quality issues and stormwater management practices such as rain gardens and rain barrels. Program objectives include the exploration of various aspects of the natural environment on school grounds, the detailed documentation of findings related to these explorations, and the communication of these findings to the school community. As part of this program, several New Jersey State Core Curriculum Content Standards for science (5.1, 5.3, and 5.4), 21st-century life and careers (9.1, 9.3, and 9.4), and social studies (6.3) are addressed. Every school is unique in its need for stormwater management, so each school's *Stormwater Management in Your Schoolyard* program can be delivered in a variety of ways. This program can be tailored for grades K–8 or 9–12 and can be offered to meet a variety of schedules.






MAINTENANCE PROCEDURES

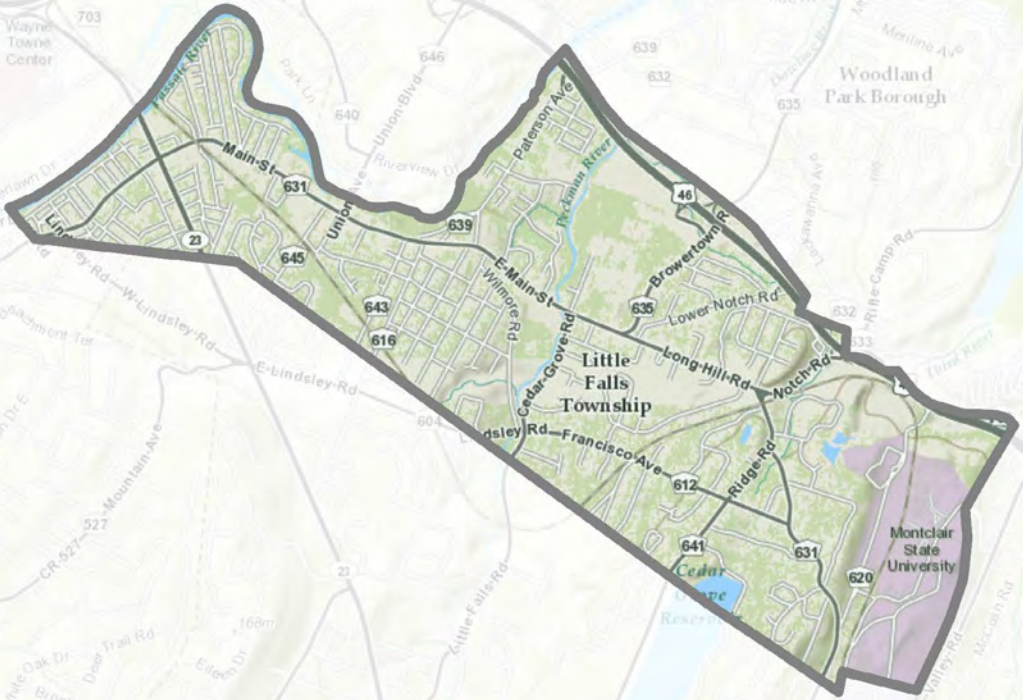
MAINTAINING LITTLE FALLS' GREEN INFRASTRUCTURE SYSTEMS

1. VEGETATED SYSTEMS
   - Rain Gardens
   - Stormwater Planters
   - Bioswales

2. RAINWATER HARVESTING
   - Rain Barrels
   - Cisterns

3. STORAGE, QUANTITY, AND INFILTRATION
   - Pervious Pavements

4. COMBINATION OF STRATEGY TYPES



VEGETATED SYSTEM MAINTENANCE

RAIN GARDEN:

Weekly

- Water
- Weed
- Inspect for invasive plants, plant health, excessive sediment, and movement of sediment within the rain garden
- Observe the rain garden during rain events and note any successes (Example of success: stormwater runoff picks up oil and grease from the parking lot, flows through a curb cut, and into a rain garden; the rain garden traps the nonpoint source pollutants before they reach the nearby waterway)

Annually

- Mulch in the spring to retain a 3 inch mulch layer in the garden
- Prune during dormant season to improve plant health
- Remove sediment
- Plant
- Test the soil (every 3 years)
- Harvest plants to use in other parts of the landscape
- Clean debris from gutters connected to rain garden
- Replace materials (such as river rock and landscape fabric) where needed

BIOSWALE:

Very similar maintenance regime to rain gardens

RAINWATER HARVESTING SYSTEM MAINTENANCE

RAIN BARREL:

- Keep screen on top and a garden hose attached to the overflow to prevent mosquitoes- change screen every two years
- Remove debris from screen after storms
- Disconnect the barrel in winter- store inside or outside with a cover
- Clean out with long brush and water/dilute bleach solution (~3%)

CISTERN:

- In the fall prepare your cistern for the winter by diverting flow so no water can enter and freeze within the barrel
- Weekly check: Check for leaks, clogs and other obstructions, for holes and vent openings where animals, insects and rodents may enter, repair leaks with sealant, and drain the first flush diverter/roof washer after every rainfall event
- Monthly check: Check roof and roof catchments to make sure no debris is entering the gutter and downspout directed into the cistern; keep the roof, gutters and leader inlets clear of leaves; inspect the first flush filter and all of its attachments, make any necessary replacements; inspect cistern cover, screen, overflow pipe, sediment trap and other accessories, make any necessary replacements

STORAGE, QUANTITY, & INFILTRATION SYSTEM MAINTENANCE

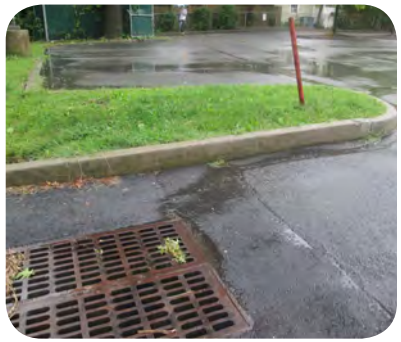
POROUS ASPHALT & CONCRETE:

- Materials cost is ~20-25% more than traditional asphalt or concrete
- Long-term maintenance is required by routine quarterly vacuum sweeping
- Sweeping cost may be off-set by reduced deicing costs
- Asphalt repairs can be made with standard asphalt not to exceed 10% of surface area
- Concrete repairs can be made with standard concrete not to exceed 10% of the surface area

UNDERGROUND DETENTION:

- Periodic inspections of the inlet and outlet areas to ensure correct operation of system
- Clean materials trapped on grates protecting catch basins and inlet area monthly
- Primary maintenance concerns are removal of floatables that become trapped and removal of accumulating sediments within the system; this should be done at least on an annual basis
- Proprietary traps and filters associated with stormwater storage units should be maintained as recommended by the manufacturer
- Any structural repairs required to inlet and outlet areas should be addressed in a timely manner on an as needed basis
- Local authorities may require annual inspection or require that they carry out inspections and maintenance



POTENTIAL PROJECT SITES


631
Main St
631
Main St
643
Warren St



The site is Little Falls Methodist Church, located at 139 Main Street. The site slopes from south to north. In the northwest corner of the site there is a grassy area that can be converted to a grassed bioswale so that runoff from the parking lot can be captured and slowed before reaching the road. The parking lot is in moderate condition, and pervious pavement should be considered when repaving. On the east side of the building there is extensive erosion from sheet flow of water that runs off the steeply pitched roof. A large bioswale could be constructed to slow the flow of water to the road and prevent further erosion.

SUITABLE GREEN INFRASTRUCTURE STRATEGIES:

- ☐ rain gardens
- ☐ rain barrels
- ☑ pervious pavement
- ☐ curb cuts
- ☐ buffers
- ☑ bioswales
- ☐ stormwater planters
- ☐ cisterns
- ☐ depaving


631
Main St
643
Warren St
616
Stanley

The site is the Little Falls Public Library, located at 8 Warren Street. The site slopes from west to east. Downspouts are located on the east side of the building and are connected to discharge onto the sidewalk and onto Stevens Avenue. These downspouts could be disconnected and routed into a rain garden. The sidewalk is in need of repair and could be replaced with pervious pavement.

SUITABLE GREEN INFRASTRUCTURE STRATEGIES:

- [x] rain gardens
- [ ] rain barrels
- [x] pervious pavement
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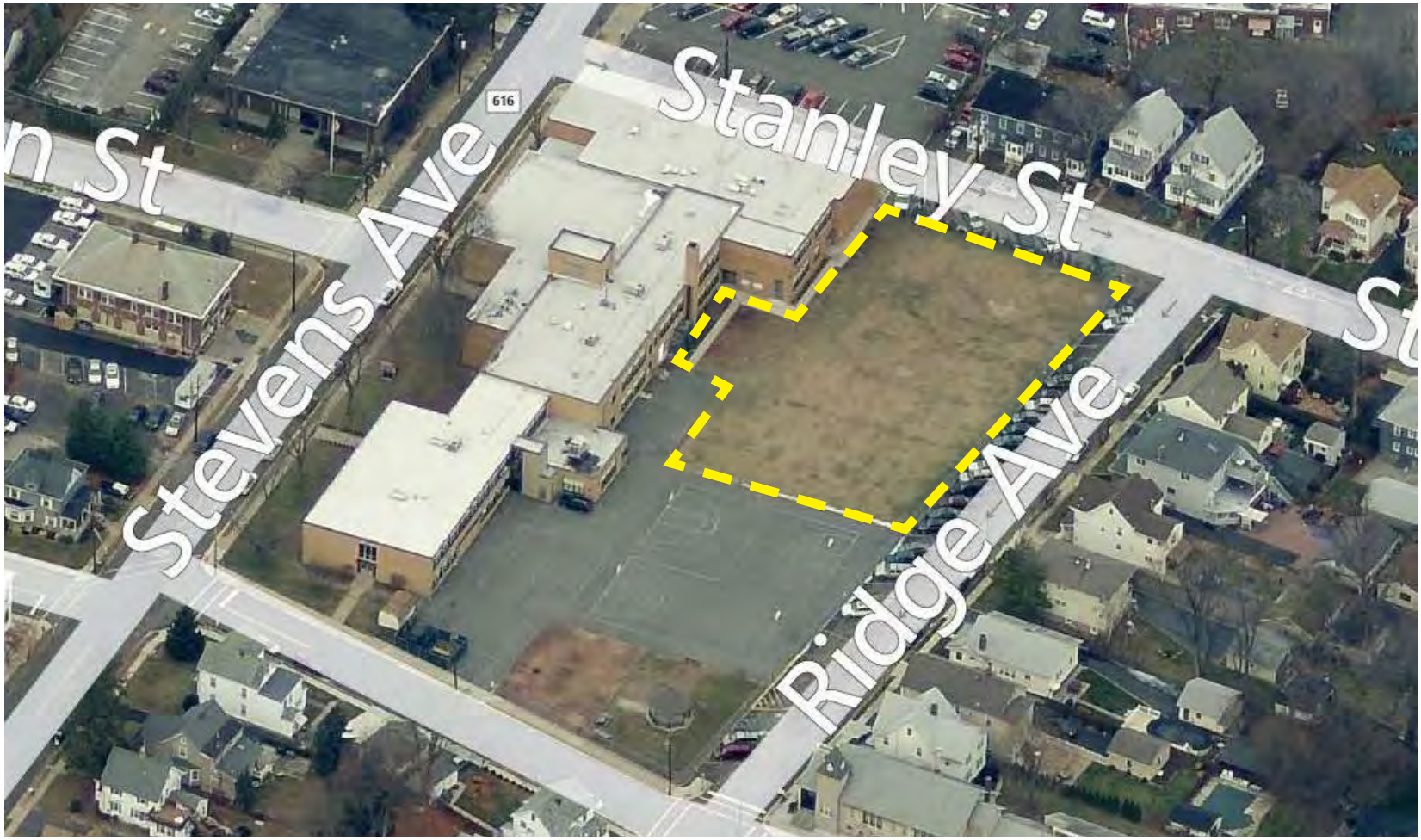
- [ ] cisterns
- [ ] depaving

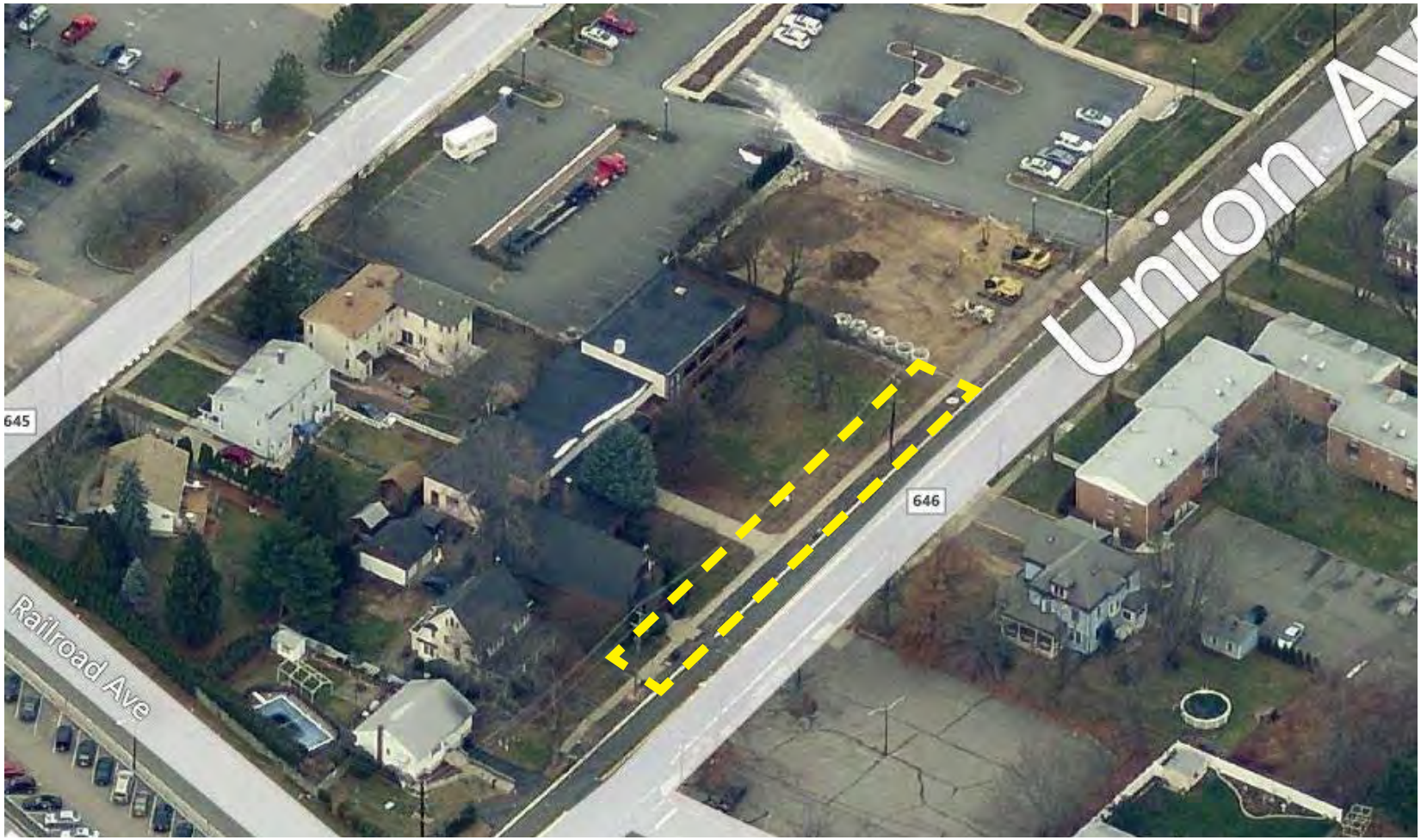

Stevens Ave
Stanley St
Ridge Ave
616

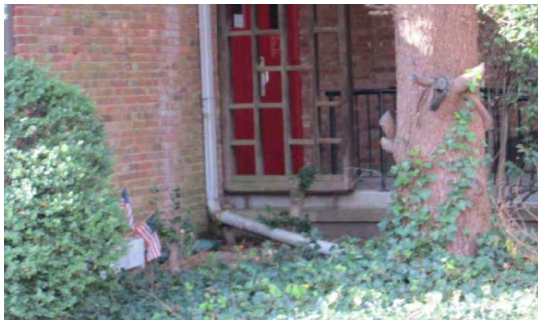


The site is Little Falls Public School #1, located at 36 Stevens Avenue. Most of the property slopes from west to east. Near the southwest of the property, the site slopes from north to south and from south to northwest on the southeast corner. There are no external downspouts and due to schoolyard use, there is mild erosion in the western front of the school. In the eastern backyard there is a grassy area where a bioswale or a rain garden can be implemented to slow runoff flow from the playground to the road.

SUITABLE GREEN INFRASTRUCTURE STRATEGIES:

- [x] rain gardens
- [ ] curb cuts
- [ ] stormwater planters
- [ ] rain barrels
- [ ] buffers
- [ ] cisterns
- [ ] pervious pavement
- [x] bioswales
- [ ] depaving


Union Av
645
646
Railroad Ave


The site is St. Agnes' Church, located at 65 Union Avenue. While there are many downspouts on the building, due to slope, any raingardens constructed would require re-grading. In the front of the building to the southeast is an eroded curb and sidewalk. The area can be replaced with pervious pavement or converted into a bioswale. Additional parking is located to the southeast of the main building, across the street. The lot is in disrepair and repaving is needed. Perhaps pervious pavement, along with a redesign of parking spaces to maximize utility, could be implemented.

SUITABLE GREEN INFRASTRUCTURE STRATEGIES:

- [x] rain gardens
- [ ] curb cuts
- [ ] stormwater planters
- [ ] rain barrels
- [ ] buffers
- [ ] cisterns
- [x] pervious pavement
- [x] bioswales
- [ ] depaving


Willow Ave
Sindle Ave
Peckman Rd
Peckman River

The site is Little Falls Department of Public Works located at 70 Sindle Avenue. The site backs up onto the Peckman River. The bank is covered in Japanese Knotweed, an invasive plant. A planted filter strip along the river could be used to buffer the bank and limit the spread of undesirable plants. The centermost building has downspouts that discharge to the parking lot. These could connect to a cistern collecting runoff to help with vehicle washing, filling the street sweeper, the jet truck, etc.

SUITABLE GREEN INFRASTRUCTURE STRATEGIES:

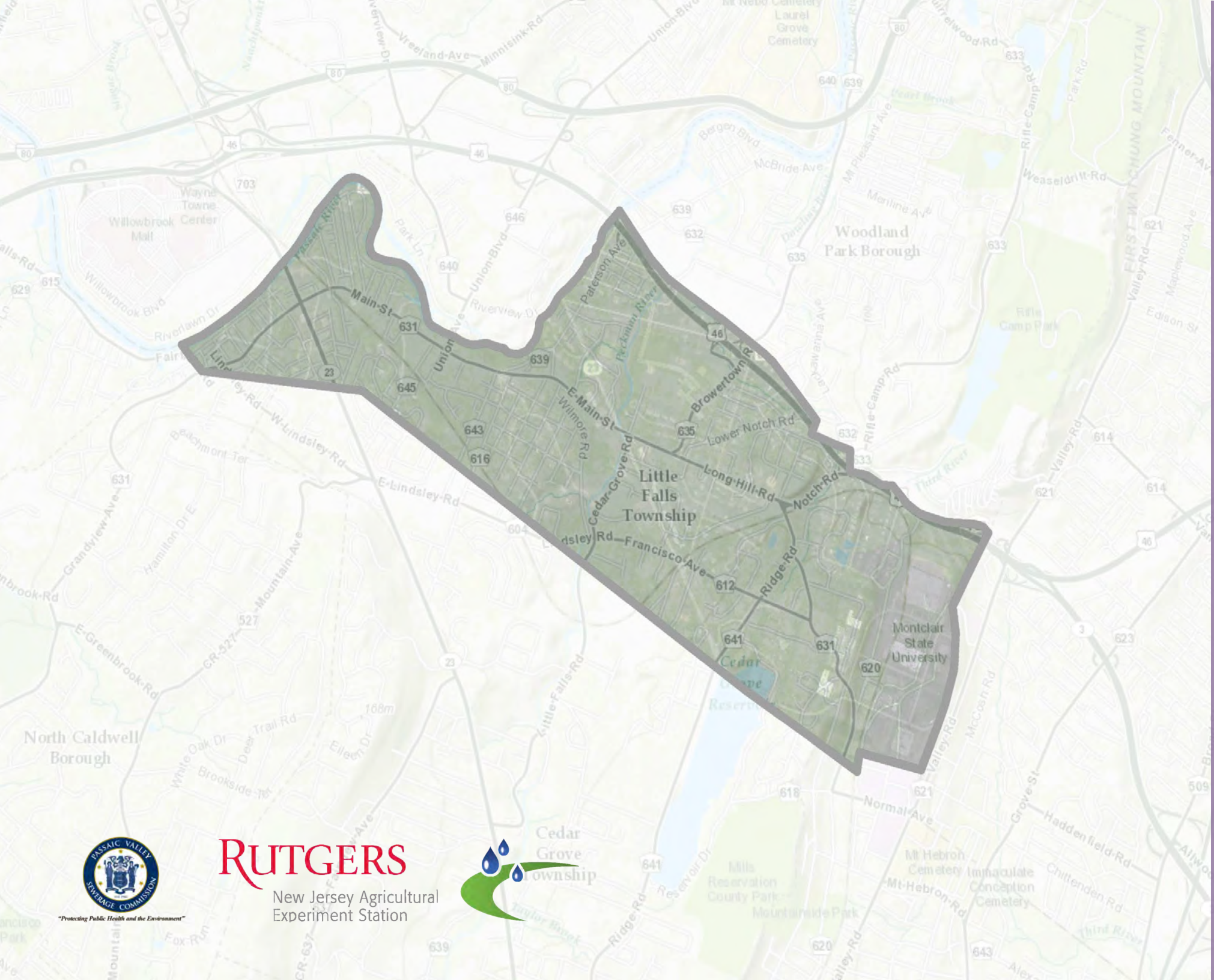
- ☐ rain gardens
- ☐ rain barrels
- ☐ pervious pavement
- ☐ curb cuts
- ☑ buffers
- ☐ bioswales
- ☐ stormwater planters
- ☑ cisterns
- ☐ depaving


Hobson Ave
Barber St
Riverview Circle
Cherry Way
Wills
E Woodcliffe Ave
Louis St
William St
Parkway
Passaic
Park Ln
Zeliff Ave
Fairfield Ave
Island Ave
West End Ave
Muller Pl
631

Many of these properties are in the process of being demolished or elevated to withstand flooding. Pre-existing stormwater management is limited to an outflow pipe that discharges directly into the river and two pump stations. Contiguous sites in the floodplain could be converted into a vegetated buffer, while isolated sites could manage stormwater through rain gardens, depaving, and bioswales. There is an opportunity to create a green-way or network of open park space for the community.

SUITABLE GREEN INFRASTRUCTURE STRATEGIES:

- [x] rain gardens
- [ ] curb cuts
- [x] stormwater planters
- [ ] rain barrels
- [x] buffers
- [ ] cisterns
- [x] pervious pavement
- [x] bioswales
- [x] depaving



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