



St Albans, VT

# Green Stormwater Infrastructure Bicycle Tour

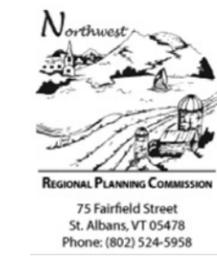


## View the online map!

To view this map and other communities', visit: [www.uvm.edu/seagrant/gi-bike-map](http://www.uvm.edu/seagrant/gi-bike-map)

This is a map of Green Stormwater Infrastructure (GSI) installations in St. Albans, Vermont. It was developed by the Vermont Green Infrastructure Collaborative, which is a partnership between the Vermont Department of Environmental Conservation and Lake Champlain Sea Grant. We worked in collaboration with many partner organizations to identify exemplary GSI practices along a safe bicycling route.

[dec.vermont.gov/watershed/cwi/green-infrastructure](http://dec.vermont.gov/watershed/cwi/green-infrastructure)



A great deal of credit is owed to the City of Portland, Oregon and its Stormwater Cycling Tour Map, which served as the inspiration for this St. Albans, Vermont version.

## Green Stormwater Infrastructure

When it rains in a city, water hits impervious surfaces such as roofs, roads, driveways, and sidewalks and runs over them, carrying pollutants to our waterways. This runoff is called stormwater. In non-urbanized areas, most of the rain that falls filters into the ground to be used by trees and vegetation or to recharge the groundwater supply. Green Stormwater Infrastructure (GSI) works by mimicking natural conditions. Specific locations in urban areas are identified where vegetation, soils, and porous substrates are used to soak up stormwater. Using GSI to manage stormwater not only helps to improve river, lake, and pond water quality, but has the added benefit of beautifying our cities.

### Practices you will see on this tour:

-  **STORM-FRIENDLY PAVEMENT**  
a type of pavement that allows rainwater to filter through it rather than running across its surface and picking up pollutants along the way. Permeable Pavers, Porous Concrete, and Stormcrete® are all examples of storm-friendly pavements.
-  **STORMWATER VELOCITY REDUCERS**  
structures (e.g., a planted vegetative bed) that help to slow down the speed at which stormwater reaches local waterways. This practice is particularly effective during large rainfall events when flash flooding can occur.
-  **LARGE TREES IN THE URBAN CANOPY**  
trees that intercept and absorb rainfall, reducing the amount of polluted water that enters waterways from impervious surfaces.
-  **RAIN GARDENS AND BIORETENTION BASINS**  
depressed vegetated garden areas designed to accept stormwater runoff from roadways, driveways, parking lots and roofs. The water that exits these systems is much cleaner than the stormwater that enters it.
-  **GRAVEL OR CONSTRUCTED WETLANDS**  
engineered systems designed to capture and filter stormwater through gravel, sand, soil, and plant roots. Water exiting these systems is much cleaner than incoming water.
-  **RIPARIAN BUFFER RESTORATION PROJECTS**  
projects that restore vegetation on the banks and riparian areas of streams to minimize soil erosion and therefore the movement of nutrients to surface water during large storm events.
-  **STORMWATER PONDS**  
manmade water bodies situated next to large areas of impervious surface where stormwater can gather and slowly filter into the ground instead of running across streets, sidewalks, parking lots or driveways and into surface waters.

 This icon indicates on-site educational signage



Park & Ride Rain Garden



Willows and Pond at the Medical Center



Rugg St. Bioretention



Taylor Park Planter Boxes



Taylor Park Permeable Pavement



Taylor Park Tree Canopy



Nason St Stream Buffer



Collins Perley Stream Buffer



Taylor Park Velocity Reducer

Along this tour you will see a variety of green stormwater infrastructure practices, including permeable pavement, rain gardens and bioretention basins, gravel wetlands, well-developed urban tree canopies, stormwater ponds, and vegetated stream buffer restoration projects. All provide valuable stormwater management functions as well as multiple co-benefits such as wildlife habitat, urban heat island mitigation, and honey bee foraging sites.

All sites on this map are either on publicly-owned land or visible from the public right of way. We encourage you to respect all safety and traffic rules while enjoying this tour of St. Albans' green stormwater infrastructure.

Green Stormwater Infrastructure (GSI) simulates the natural hydrology of the area. Maintaining the hydrology of the land, even as we develop, is good for water quality.

## Highlights of St. Albans' Stormwater Infrastructure

### 1 GRAVEL WETLAND AT THE PARK AND RIDE

*Fairfax Road*  
Constructed gravel wetlands mimic natural wetlands by allowing stormwater filtration, retention, treatment, evapotranspiration, and slowing discharge into groundwater and surface waters. Native wet-tolerant plants in the wetland, such as cattails and pickerel weed, help to slow stormwater while also filtering out pollutants and retaining nutrients. In the sediment, microbes and plant roots transform nutrients, heavy metals, and bacteria, effectively keeping these pollutants out of surface waters.

### 2 MEDICAL CENTER STORMWATER POND AND WILLOW TREES

*4 Crest Road*  
Stormwater ponds are built to capture and store runoff from impervious surfaces such as parking lots. These ponds can serve as habitat for wildlife. To maintain the function of these ponds, periodic sediment removal is necessary. The willow trees planted on the side of this stormwater pond keep the pond healthy by stabilizing soil to avoid excessive erosion and provide additional wildlife habitat.

### 3 RUGG ST. BIORETENTION

*36 Rugg Street*  
Five bioretention basins were installed along Rugg St. to capture stormwater from the road. Bioretention is a common stormwater management method. In these depressed gardens, stormwater is retained and slowed. Plant roots use some water, while the rest is able to soak into the ground rather than flow directly into storm drains or streams.

### 4 TAYLOR PARK – VELOCITY REDUCER

*2 Church Street*  
These sloped, planted beds at the top of Taylor Park are designed to slow the flow rate of stormwater. During heavy storms, water flows over pavement into surface waters. These vegetated beds help slow down the water and physically remove sediments. The plants also stabilize the slope with their roots and reduce the impact of heavy rain on soil, minimizing erosion following heavy storms.

### 5 TAYLOR PARK – TREE CANOPY

*36 N Main Street*  
This park in the heart of St. Albans offers a wide selection of shade trees that intercept a significant amount of rainwater and also use this water to grow. Urban tree patches in cities are crucial for stormwater management due to their leaves (which catch rain) and their roots (which take up water from the ground). Urban trees also provide relief from the urban heat island effect through a process called evapotranspiration. The types of trees in this park include sugar maples, silver maples, and red oaks.

### 6 TAYLOR PARK – PERMEABLE PAVEMENT

*36 N Main Street*  
Instead of using impervious pavement to build the sidewalk at the bottom of Taylor Park, in 2008, the City of St. Albans constructed an 800' x 10' walkway made with porous concrete. When it rains, water passes through this pavement by flowing through porous material into the ground. Although the soils here are clay-rich, an underdrain system was installed below the gravel to improve water infiltration rates. This underdrain connects to the city storm-sewer system to ensure proper drainage during large rain events. While the stormwater enters the storm-sewer and ultimately local surface waters, it is first cleaned by infiltrating through the ground.

### 7 TAYLOR PARK – PLANTER BOXES

*2 N Main Street*  
The planter boxes catch stormwater flowing on Main Street through entryways in the curb (called curb-cuts). These depressed gardens take in stormwater and allow it to filter into the ground, removing it from the street and eliminating its entry into surface waters from this section of Main Street. These planter boxes require some maintenance such as removal of built up sediments, removal of dead vegetation, and pruning.

### 8 HOUGHTON PARK – TREE PLANTING

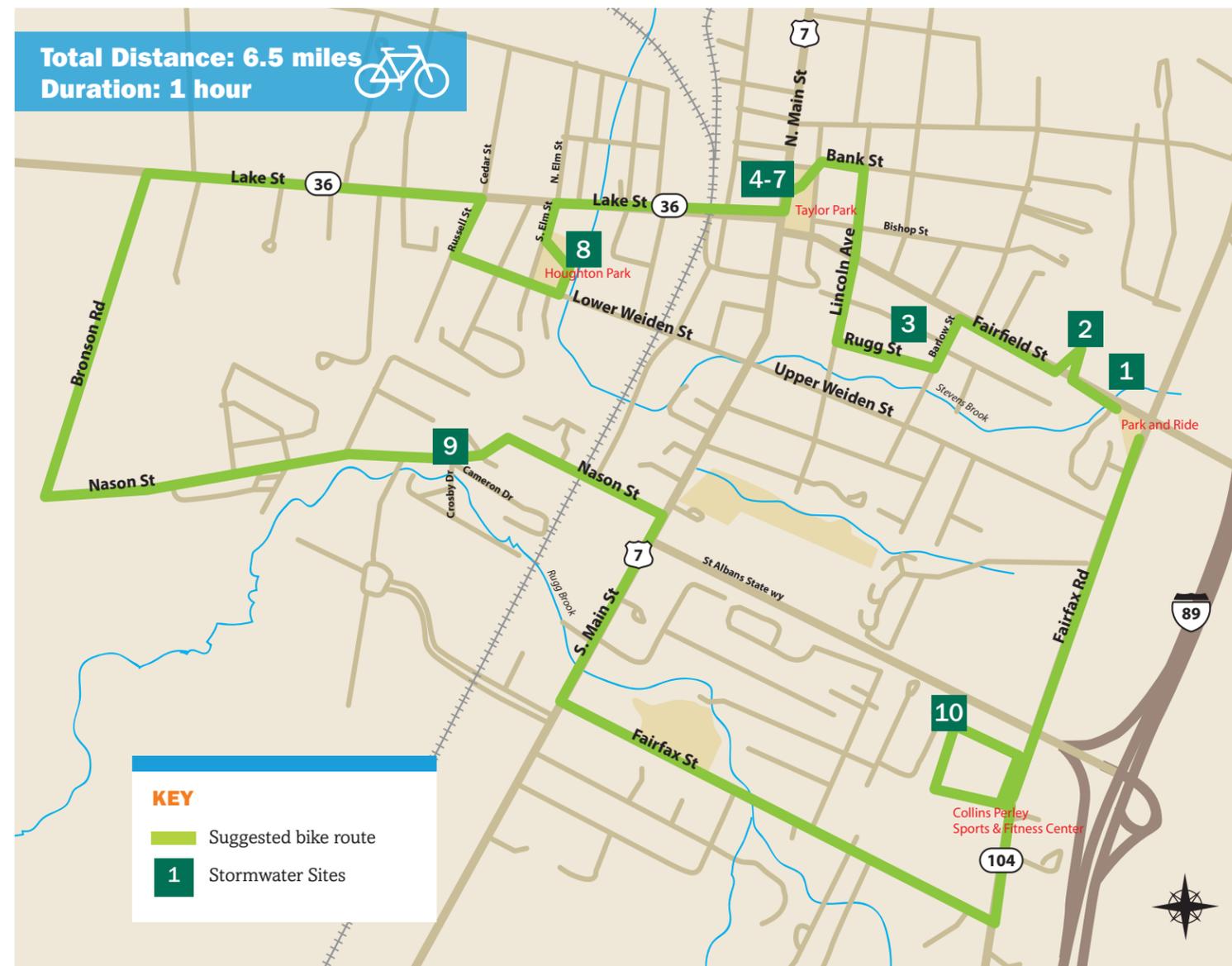
*S Elm Street*  
This tree planting project in Houghton Park along the Stevens Brook addresses high phosphorus levels in St. Albans Bay by minimizing erosion and excess sediment from entering Stevens Brook. The roots of trees and shrubs along streambanks help to keep bank sediments in place, and therefore minimize the amount of phosphorus moving into surface waters (as this nutrient often travels attached to soil particles). Trees and shrubs planted here include green ash, river birch, and serviceberry.

### 9 RUGG BROOK STREAM RIPARIAN BUFFER RESTORATION –

*1 Crosby Drive*  
This riparian buffer project next to Rugg Brook was completed in May 2006 and has since grown into a beautiful and diversely vegetated streambank providing habitat for plants and wildlife. The average width of the buffer is 35-feet along a 1,250 foot stretch that was previously lawn. The additional root surface area provided by the woody vegetation helps to reduce erosion and stabilize the streambanks as well as limit stormwater flowing into the brook.

### 10 STREAM RIPARIAN BUFFER RESTORATION

*Collins Perley Athletic Center - 890 Fairfax Road*  
A northern tributary to the Rugg Brook runs through this large sports complex. Historically, this stream has regularly flooded causing significant erosion, and was identified to have high concentrations of nutrients, which are a driver of harmful algal blooms in Lake Champlain. With grant funding, the natural stream channel was restored and the riparian area was planted with shrubs and trees to minimize flooding and erosion. Ongoing stewardship efforts at this restoration site include addressing areas of localized erosion as well as removing invasive species.



## GLOSSARY OF TERMS

**Native plant** – A plant that occurs naturally in a region, state, ecosystem, or habitat without direct or indirect human actions.

**Evapotranspiration** – the process by which water is transferred from the land to the atmosphere from soils, plants, and other surfaces.

**Erosion** – the process by which the surface of the Earth is worn away by the action of water, wind, and other natural events

**Riparian** – the land alongside a stream or river

**Runoff** – rainwater or snowmelt that runs across the land

**Urban Heat Island Effect** – the temperature discrepancy between built areas and nearby rural areas, where built areas are hotter.

## ICONS

-  Storm-Friendly Pavement
-  Stormwater Velocity Reducers
-  Stormwater Trees and Urban Canopy
-  Rain Gardens and Bioretention
-  Gravel or Constructed Wetlands
-  Riparian Buffer Restoration Projects
-  Stormwater Ponds
-  On-site Educational Signage