

Green Stormwater Infrastructure Bicycle Tour

Burlington, VT





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View the interactive map! for additional details about Burlington's stormwater infrastructure:

UVM.EDU/SEAGRANT/GREEN-STORMWATER-INFRASTRUCTURE-BIKE-TOUR

This map of Green Stormwater Infrastructure (GSI) Installations in Burlington, Vermont is brought to you by the Vermont Green Infrastructure Collaborative and our many partners.

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 Burlington, Vermont version.

Green Stormwater Infrastructure

When it rains in the city, water hits impervious surfaces like roofs, roads, driveways, and sidewalks and runs off carrying with it pollutants that ultimately end up in our waterways. This runoff is called stormwater. Before cities (including Burlington) were built, most of the rain that fell filtered 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, employing vegetation, soils, or porous substrates to soak up stormwater in highly impervious urban settings. 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** allows rainwater to filter through it rather than running off and picking up pollutants along the way. Permeable Pavers, Porous Concrete, and Stormcrete® are all examples of storm-friendly pavement.
-  **STORMWATER TREES AND URBAN CANOPY** are large trees in urban settings that intercept and absorb rainfall, allowing less of it to flow over dirty surfaces and into waterways.
-  **GREEN ROOFS** are roofs covered (either partially or fully) with vegetation and growing media. The plants use the rainwater and release it as vapor back into the atmosphere (a process called evapotranspiration). This type of roof creates less runoff than a conventional style.
-  **RAIN GARDENS AND BIORETENTION** are depressed vegetated garden areas designed to accept stormwater runoff from driving surfaces and roofs. The water that exits these systems is much cleaner than the stormwater that enters it.
-  **GRAVEL OR CONSTRUCTED WETLANDS** are engineered systems designed to capture and filter stormwater through gravel, sand, soil, and plant roots. Water exiting these systems is much cleaner than the water coming in.
-  This icon indicates on-site educational signage



Champlain College: Student Life Green Roof



Champlain College: Permeable Pavers



Permeable Pavers and Silva™ Cells on S. Winooski Avenue



UVM: Bioretention Research Laboratory



ECHO Leahy Center for Lake Champlain Rain Gardens and Permeable Sidewalk



Hyde Street Rain Garden



Decatur Street Stormwater Curb Bump Outs



Along this tour you will see a variety of green infrastructure, including permeable pavements, rain gardens and bioretention, gravel wetlands, green streets, green roofs, urban canopy, and notable mature trees. All provide valuable stormwater management function as well as multiple co-benefits such as carbon sequestration, wildlife habitat, urban heat island mitigation, traffic calming, and honey bee forage.

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 Burlington's 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 in Lake Champlain.

Highlights of BTV Stormwater Infrastructure

1 LOCAL MOTION

1 Steele St, Suite 103

Need to rent a bike or find out where to go on your two-wheeled machine? Vermont's statewide non-profit bike and walk advocacy organization, Local Motion, can help with that. Visit them on the waterfront bike path for all your bike-riding and pedestrian needs.

2 GREEN ASH AT PERKINS PIER

1 Lavalley Ln

There are a number of green ash (*Fraxinus pennsylvanica*) planted near the playground at Perkins Pier. Green ash is tolerant of flooding (which happens at this site). About 1,000 are planted throughout the city. However, green ash are currently threatened by the invasive forest pest, the emerald ash borer (EAB). EAB is not yet in VT, but is in 23 other states, and communities like Burlington are preparing for how to manage for the pest if and when it arrives.

3 HILTON GARDEN INN PERMEABLE PAVERS

101 Main St

To either side of the main driveway permeable pavers line parking spots and walking area. The Hilton was able to save on their City stormwater fees by reducing their impervious surface area with this installation.

4 PERMEABLE PAVERS AND SILVA™ CELLS

179 South Winooski Ave

Installed in 2015 as part of a grant awarded to the City of Burlington by the Vermont Department of Environmental Conservation's Ecosystem Restoration Program, this system is helping the city to respond to chronic flooding. Rain falling on the sidewalk now drains through the permeable pavers and accesses the roots of the street trees planted along the curb. Large soil volume and ample water ensure that these trees will grow large and healthy.

5 CHAMPLAIN COLLEGE: PERMEABLE PAVERS

343 Maple St

A permeable walking path connects pedestrians from Maple Street to Perry Hall.

6 CHAMPLAIN COLLEGE: GRAVEL WETLAND

251 South Willard St

A large gravel wetland catches water from Perry Hall on this hilly campus. Native plant species in this wetland include Meadowsweet, Red Osier Dogwood, Blue Flag Iris, and Cardinal Flower.

7 CHAMPLAIN COLLEGE: STUDENT LIFE GREEN ROOF

264 South Willard St

From the second floor of the IDX Student Life Center there is a publicly accessible patio, just over the railing is a green roof with a variety of flowering sedums. Rain that falls on this roof waters the plants. Through evapotranspiration, the plants return this water to the atmosphere as vapor keeping dirty water out of the rivers and lakes.

8 UVM: OLDEST TREES ON CAMPUS

73 South Prospect St

The few remaining eastern white pines (*Pinus strobus*) on UVM's main green are the oldest trees on campus. They are each about 25" in diameter and it is estimated that they were planted in the 1830s.

9 UVM: AIKEN GREEN ROOF

81 Carrigan Dr

The green roof on this LEED® Platinum Certified building is being studied for performance of pollutant removal in a northern climate. There is no public access to the roof, but a touch screen monitor on building's first floor offers information, photos, and data visualization of the research findings. (As you enter the building, check out the EcoMachine on the right, treating all the building's wastewater using plants and microorganisms.)

10 UVM: BIORETENTION LABORATORY

63 Carrigan Dr

Eight bioretention cells are being investigated for pollutant removal performance under climate change conditions (20% increase in precipitation). Two plant treatments are being researched: high biodiversity native plants, and low diversity "roadside" plants.

11 UVM: MEDICAL CENTER GREEN ROOF

111 Colchester Ave

Native drought-tolerant plants provide habitat and reduce stormwater volume from the roof. This street-level roof includes native drought-tolerant plants to provide habitat. Open areas create a gathering space for hospital staff and visitors. Be sure to read the educational signage for more information on other unique features of this installation.

12 UVM: VOTEY HALL RAIN GARDEN

48 Colchester Ave

Student members of the Vermont chapter of Engineers Without Borders designed and installed this rain garden in 2006. The vegetated area slows and filters stormwater from the Votey Hall parking area.

13 NORTH STREET STORMWATER CURB BUMP OUTS

522 North St

Curb bump outs filled with gravel and plants slow traffic and allow stormwater to soak into the ground in this sandy-soiled part of the City.

14 BLACK LOCUST GROVE

77 Pomeroy St

Black locust (*Robinia pseudoacacia*), considered invasive in some states, is a colonizing tree (sprouts from root stock with a shallow and aggressive root system). There is a big grove of black locusts featuring early June flowers. The wood is extremely hard and decay resistant - farmers traditionally used this material for fence posts.

15 HYDE STREET RAIN GARDEN

151 Hyde St

This curb extension rain garden installed in Burlington's Old North End provides traffic calming, improved pedestrian movement, and stormwater pollutant removal.

16 PERMEABLE PAVERS

237 North Winooski Ave

Permeable pavers between the sidewalk and the building offer stormwater infiltration and attractive pedestrian access.

17 DECATUR STREET STORMWATER CURB BUMP OUTS

39 Decatur St

Curb bump outs encourage slower driving in neighborhood areas and combined with curb cuts and depressed gardens, allow stormwater to infiltrate into the soil instead of flowing directly into the storm drain.

Total Distance: 7 miles
Total Hours: 1-1 ½ hours



KEY

- Suggested bike route
- Stormwater Sites
- Bike Path (Burlington Greenway)

18 HACKBERRY TREE

87 Intervale Ave

A large hackberry (*Celtis occidentalis*) on Intervale Avenue is one of only a few large street trees in Burlington's Old North End. As the City's oldest neighborhood, it was originally planted with elms that needed to be removed in the mid to late 1900s due to dutch elm disease. Burlington was once home to over 11,000 American elm trees.

19 URBAN CANOPY AT BATTERY PARK

33 Park St

This urban park offers sweeping views of Lake Champlain and boasts an impressive collection of notable trees. The umbrella black locust (*Robinia pseudoacacia* 'Umbraculifera') is an unusual variety with a dense, wide canopy - great for intercepting rainfall.

20 SKATEPARK GRAVEL WETLANDS

Burlington Greenway (Bike Path)

Plant roots, soil, and microbes work together to filter runoff from the skatepark in a centralized gravel wetland. Between the bike path and the parking lot, a linear version manages runoff from the driving surfaces and reduces salt and sediment to the Lake.

21 BOAT LAUNCH RAIN GARDEN

100 Penny Ln

Maintained by volunteers through the Chittenden County Stream Team, this tiny corner rain garden collects runoff from the public boat launch parking lot.

22 WATERFRONT PARK DRIVABLE GRASS

Burlington Greenway (Bike Path), Waterfront Park

Yearly summer festivals and concerts on Burlington's Waterfront Park compact the soil where trucks unload materials. Permeable planted pavement was installed to support the weight of the vehicles without compacting the soil and allows water to infiltrate through the grass and soil.

23 COLLEGE STREET GRAVEL WETLAND

1 College St

This roundabout garden collects stormwater from the surrounding impervious roadway. The water filters through sand, gravel, and plant roots. The treated stormwater enters the lake.

24 ECHO LEAHY CENTER RAIN GARDENS AND PERMEABLE SIDEWALK

1 College St

Rain gardens in the pavilion on the lake-side of the building collect water from roof and deck areas and filter it through planted beds and into the ground before entering the lake. The pavers and concrete adjacent to the planters are porous - which means stormwater filters through the pavement and into the ground instead of running off.

25 BURLINGTON BAY MARKET & CAFE

125 Battery St

You did it! Treat yourself to a maple creemee at Burlington's best soft serve ice cream joint. While enjoying your treat, take in a prime view of beautiful Lake Champlain from the front patio.

ICONS

- Storm-friendly pavement
- Trees and urban canopy

Green roof

Rain gardens and bioretention

Gravel or constructed wetlands

On-site educational signage