



Vermont

Green Streets Guide

A Resource For Planning And Building Green Infrastructure Within Our Communities

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PLANT **LIVE** GROW



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STOWE, VERMONT: The beautiful character of many Vermont towns.

Over 250 towns, villages, and cities in Vermont are connected by shared natural landscapes. From forested hills and rolling farm fields to winding rivers and intricate wetlands, Vermonters value the diversity in our backyards and the plants, animals, rivers and lakes that bring us outside. Yet our communities are also linked by roads – interstates, paved connectors, rural backroads, and private lanes. Both practical and abundant, roads divide as much as they connect. They break natural ecological processes that shape our region and, particularly in urban areas, replace the plants that we value in our everyday lives.

Stormwater, or water stemming from overland flow from a rain event or melting snow, carries with it sediment and nutrients picked up along its path. In nature, stormwater is intercepted by vegetation and filtered by the soil before it recharges streams, lakes, and groundwater. Some rain or snowfall evaporates from the tree canopy or ground, reducing stormwater volume. However, we interrupt this hydrologic cycle when we construct impervious surfaces like streets, sidewalks, and buildings. Our conventional approach to managing rainfall and snow melt is to “capture and convey,” or to channel stormwater on or under our streets into a common discharge point. These networks of streets and parking lots are often overlooked as contributors to large environmental problems such as urban air pollution and water pollution from stormwater runoff.

Vermonters know that our waterbodies are at risk. Cyanobacteria blooms in Lake Champlain, nutrient overload in Lake Memphramagog, and elevated nitrogen levels in the Connecticut River now force us to examine all aspects of our built environment that have led to a decline in watershed health across our state. Wetter winters and larger and more frequent storm events are pushing the limits of our constructed stormwater networks. With smarter design and increased knowledge of natural systems, we can now engineer and build urban infrastructure that positively impacts the water cycle and, in turn, safeguards and restores the health of our waterways.

‘Green’ needs to be at the heart of street design in Vermont for the vitality of both our environmental health and local economies. The sustainability of our waters requires that we change the way we approach street design, that we implement practices that protect and maintain the quality of our waters and contribute to the livability of our urban centers. Green Streets create opportunities for municipalities to manage stormwater in a more holistic manner, increasing mobility and a sense of community in our urban environments while reducing pollutant loading in our waterbodies. The Vermont Green Streets Guide provides direction on planning, design, and maintenance of common urban road and parking lot conditions throughout the state, moving us towards a more sustainable and connected urban environment.



“With smarter design and increased knowledge of natural systems, we can now engineer and build urban infrastructure that positively impacts the water cycle and, in turn, safeguards and restores the health of our waterways.”

Julie Moore

*Secretary, Vermont Agency of
Natural Resources*

Acknowledgements

VERMONT URBAN & COMMUNITY FORESTRY PROGRAM

Vermont Department of Forests, Parks and Recreation
in partnership with University of Vermont Extension



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We would also acknowledge that many design plans and details and in Section 6 and 7 of this guidebook are adapted from the *2009 San Mateo County Sustainable Green Streets and Parking Lots Design Guidebook* and the *2014 Philadelphia Green Streets Design Manual*.

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This Guide is intended as a springboard for action; as such, it can be read in its entirety or in sections as needed. It describes a linear process of Green Street design and build, from envisioning, to planning, to design, to maintenance, and to monitoring.

The Guide includes:

- Planning considerations to advance Green Street design along streets and in parking lots.
- Guidelines for selecting the appropriate application for the right site.
- Implementation and maintenance strategies that make Green Street design more achievable.
- Examples of Green Streets throughout the state, highlighting their successes and challenges.

Technical guidance in terms of specifications and detail drawings not included in this Guide.

Rural roads are also not covered. Refer to the [Vermont Better Roads Program](#) for further information on stormwater management, erosion mitigation, and best management practices for rural road safety and ecological protection.

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WIKIMEDIA COMMONS

MIDDLEBURY, VERMONT: Main Streets can be redone as Green Streets.

Section 1

Introduction to the Vermont Green Streets Guide

Introduction to the Vermont Green Streets Guide



PORTLAND, OREGON: NE Siskiyou Street, Portland's first green street project.

Conventional street design dominates large expanses of our urban landscapes, providing corridors for vehicle movement and above- and below-ground space for utilities. Green Street design, a new take on urban street design, takes a complete view of the street, seeing stormwater as a resource, universal mobility as a priority, and local plants as co-engineers of a complex built environment. It reimagines a singular street design that efficiently prioritizes multiple uses and recognizes the unique value of shared spaces.

Green Street design involves more than the addition of a little shrubbery; it considers local ecology and addresses environmental stressors caused by street design, traffic, and human activity. It shapes sustainable communities where streets are both safe and comfortable for all users. And it boosts the economy by drawing people to downtowns and village greens enhanced by beautiful streetscapes and defined by a sense of place.

1.1 ABOUT GREEN STREETS

A Green Street framework relies on its three pillars: **Green Stormwater Infrastructure**, **Mobility**, and **Placemaking**.

- **Green Stormwater Infrastructure** is part of a “treatment train” approach to stormwater mitigation. Rather than relying entirely on rapid conveyance of runoff in underground pipe systems directly to waterways, Green Stormwater Infrastructure intercepts, holds, slows down, and treats stormwater as close to its source as possible. By bringing parts of natural hydrologic systems into streets, Green Street designs can replicate natural mechanisms that reduce or slow down the flow of stormwater and allow it to be cleaned by plants and soil.
- **Mobility** considers street design for people of all ages and physical abilities. It includes safe access for pedestrians, bicyclists, motorists, and public transit riders. It provides amenities such as benches and shade trees that are essential for non-motorized users and encourages walking or biking, particularly for those with varying physical capabilities.

Introduction to the Vermont Green Streets Guide

- **Placemaking** is an approach to planning, design, and public space management that creates beautiful and vibrant places by focusing on a community's assets. It emphasizes human health, economic vitality, and quality of life.

By combining **Green Stormwater Infrastructure**, **Mobility**, and **Placemaking** principles, towns can build upon a context- and user-sensitive approach to conventional street and parking lot design that directly connects protection of environmental resources with transportation and community.

1.2 WHAT IS THE VERMONT GREEN STREETS GUIDE?

This Vermont Green Streets Guide is a resource for community leaders, community planners, and policymakers wishing to advocate for and implement Green Streets throughout Vermont. It serves as a step-by-step document for communities to identify why Green Streets are relevant, where and how they can be implemented, and who will implement and maintain them.

The Guide is also a tool to help community leaders evaluate the role of their streets and parking lots in the environmental, economic, and social networks of their communities. It offers a framework for intentional design that incorporates natural systems into the urbanized contexts of streets and parking lots under local or state jurisdiction. It is intended for new developments, retrofits, redevelopments, and anywhere Green Streets opportunities exist within and adjacent to the public right-of-way or parking lots.

1.3 WHY DO WE NEED GREEN STREETS IN VERMONT?

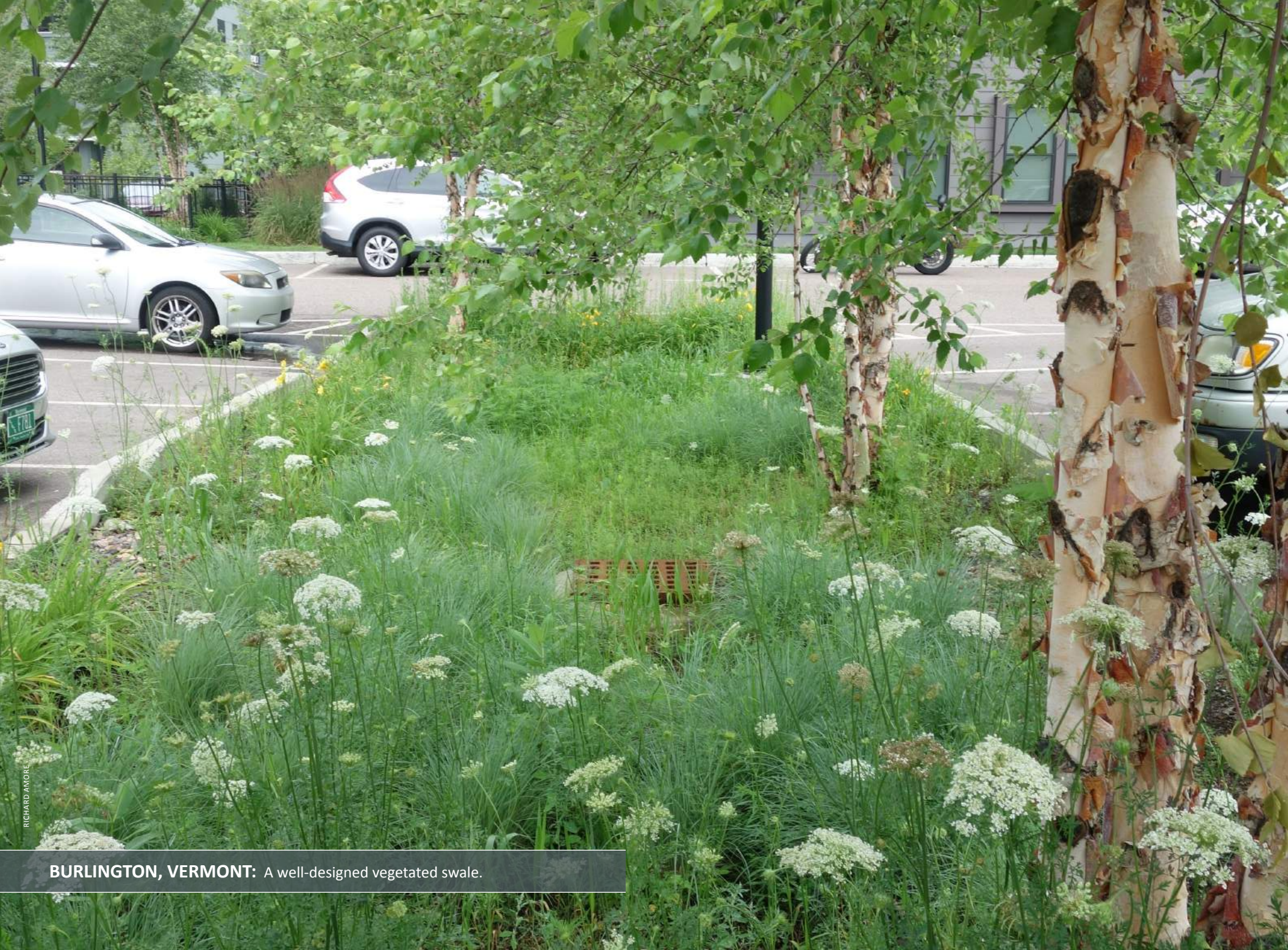
Water quality is faltering in Vermont and urban stormwater is part of the problem. Growing expanses of pavement in urban and exurban settings are adding to the stormwater pressures already created by dense development.

Investing in and maintaining vibrant and green streets in downtown and village centers attracts visitors and improves quality of life for residents. Vermonters are learning how Green Stormwater Infrastructure can help to meet multiple goals such as: absorbing runoff to effectively treat urban pollutants before they reach local waterways while creating wildlife habitat in what would otherwise be unwelcoming urban corridors. By incorporating Green Streets into the planning and design of municipal infrastructure, streets can now serve as connectors for people in cars, on foot, or on bikes. They can also provide areas for environmental mitigation, improve the safety and aesthetics of the built environment, strengthen public and community health, and build upon the natural aesthetic treasured in the state.

In Vermont, this Guide is not a stand-alone resource to facilitate a shift to Green Streets. Additional resources include:

- **Vermont Guide to Stormwater Management for Homeowners and Small Businesses**
- **Vermont Green Infrastructure Toolkit**
- **Vermont Stormwater Management Manual**
- **Vermont Rain Garden Manual**
- **Vermont Tree Selection Guide**
- **Landscape Guide for Vermont Roadways & Transportation Facilities**
- **Complete Streets: A Guide for Vermont Communities**
- **Design Toolkit for Designated Downtowns and Village Centers**

These and many more resources are available on the Vermont Urban & Community Forestry's website at vtcommunityforestry.org/green_streets.



RICHARD AMORE

BURLINGTON, VERMONT: A well-designed vegetated swale.