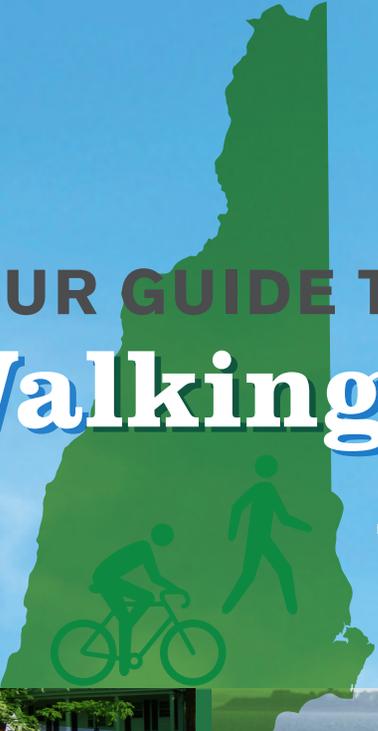


YOUR GUIDE TO PROMOTING  
**Walking and Bicycling**  
Accommodations  
IN NEW HAMPSHIRE



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**PICTURED ON COVER:**

*From left to right: Hopkinton, Rye, Keene, Littleton*

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# 1 INTRODUCTION

When walking or bicycling around your community, there may be some areas you avoid – large intersections, streets where motorists drive too fast or segments with narrow sidewalks or bicycle lanes. Maybe these areas prevent you from walking or bicycling altogether! If you have ever wished it were safer or easier to travel using a mode of transportation other than a motor vehicle, this guide is for you. Whether you have a specific improvement in mind or just generally want increased access for walking or bicycling, this guide will help you figure out how to get involved, when to get involved, and who is involved in generating change in your community.



▲ National Bike-to-School Day to the Woodman Park Elementary School in Dover.



**WHO IS THIS GUIDE FOR?** This guide is for New Hampshire residents and business owners seeking improved walking and bicycling facilities in their communities. It is for the parents who would like their children to be able to walk or bike safely to school, for the seasoned bicyclist with big ideas for new bicycle accommodations, and for the walker or runner who would have better access if their route were improved. This guide assumes the reader does not have prior knowledge of public engagement, engineering, or planning, but even those who do will be able to find specific and practical guidance to enacting change.

**WHAT IS POSSIBLE?** As a resident or business owner, you have the power to influence existing transportation projects, get new ones started, and help make long-term changes in your community. You could be a driving force behind new or improved sidewalks, bike lanes, safety features at intersections, traffic calming measures, and more. While you may not yet know the specific walking or bicycling accommodations that would make the most sense, this guide will help you get there.

## WHAT DOES IT TAKE TO MAKE CHANGE?

Effectively promoting walking and bicycling accommodations requires a mix of technical knowledge, an understanding of governmental processes, and the ability to engage the people with potential to influence a project. This guide will address all of these areas. Knowing specifically what you want and having confidence in the value of the changes you would like to see are key to making your case and meeting the intent of your plans.

**HOW IS THIS GUIDE ORGANIZED?** There are four main sections of this guide: **Background:** Why get involved and who the main players are, **From Concept to Construction:** Explanations of local and state planning processes and how you can get involved, **Design Guide:** Identification of key design concepts and standards, and **Appendix:** Additional information, resources, and links.

## WALKING

In this guide, walking generally includes travel by wheelchair as well as travel by foot, for lack of a simple more inclusive term.

Every person walks at some point in their journey, even if most of the journey is by motor vehicle, bicycle, or public transit.

# 2 BACKGROUND

## 2.1 | How Walking and Bicycling Benefit a Community

If you are reading this guide, you are probably already convinced roads should support more than just motor vehicles. However, you may have to persuade community members and decision makers that walking and bicycling accommodations are worth the time, effort, and money required to implement and maintain them. Below is a list of key benefits of bicycling and walking, most of which benefit the individuals using these modes of transportation and the community as a whole.



### WALKING & BICYCLING BENEFITS...



#### THE PEOPLE WHO WALK & BICYCLE

- A person who walks or rides a bicycle may experience all kinds of **health benefits**, including: lower blood pressure, a healthier weight, a lower risk of chronic diseases, and improved mental health.
- A person who walks or rides a bicycle can **save money** on motor vehicle maintenance and gasoline.



#### THE COMMUNITY

- Walking and bicycling foster a **greater sense of community** by creating more opportunities for social interaction.
- Pedestrians and bicycles consume less roadway space than motor vehicles, leading to **less congestion**, which benefits those who are traveling by any mode and those who live near busy roads.
- Reduced motor vehicle emissions results in **less air pollution** and therefore a **healthier community**.
- Improved walking and bicycling infrastructure **reduces the risk of crashes and injuries** of people who walk, ride bicycles, and drive.
- Improved walking and bicycling infrastructure gives people more **transportation choices**. This is especially important for children and others who do not drive.
- Homes in walkable neighborhoods are more likely to have **higher property values** than similar homes in car-dependent neighborhoods.
- Pedestrians and bicycles cause much less wear-and-tear to infrastructure than motor vehicles, leading to **reduced maintenance costs**.



#### THE PLANET

- More people choosing to walk and ride bicycles instead of drive to their destinations **reduces greenhouse gas emissions**, leading to a reduced effect on climate change and a healthier population.

## 2.2 | Who is Involved in Transportation Planning and Design?

As a person promoting transportation improvements, you will be communicating and working with people coming from a variety of positions and perspectives. Some may have a wealth of technical knowledge, while others may focus on permitting or funding. You will meet people who support changes to road design that encourage multiple modes of travel, as well as those who prefer reserving roadways primarily for motor vehicles. Understanding these different viewpoints will help you communicate effectively.



▲ Fix-a-Flat clinic for women during Bike to Work Week in Portsmouth.

### PUBLIC OFFICIALS

Because walking and bicycling facilities are typically within the public **right-of-way**, public officials will play an important role in your efforts. These government employees may be engineers, planners, administrators, or elected officials at the local, regional, or state level.

- Public officials at the **local** level include municipal staff involved with road maintenance, planning, or general decision-making. Your municipality may also have a pedestrian/bicycle coordinator.
- At the **regional** level is the Regional Planning Commission (RPC) in charge of coordinating planning efforts across the towns and cities it comprises. Nine RPCs together represent all of the communities in New Hampshire and are a crucial link between the local and state levels. *Learn more about RPCs in Sections 3.1 (Local Efforts) and 3.2 (Making Institutional Changes).*
- The **state** agency for transportation is the New Hampshire Department of Transportation (NHDOT). The NHDOT consists of five divisions and 18 bureaus. Bureaus and divisions especially relevant to walking and bicycling infrastructure can be found in the Appendix.

Public officials will generally have a very practical approach to the project development process, regarding both design and administrative needs. They are knowledgeable about budgeting for new projects and ensuring the proper permitting is in place – two crucial components to getting changes constructed.

### ENGINEERS AND PLANNERS

Engineers and planners designing public projects may work for a government agency (and may fall under the “Public Officials” category to the left) or for a contracted consulting firm. Generally, planners approach design from a big-picture perspective and may be more active in the initial stages of a project, while engineers focus on the technical details of a project and may be more involved in the final stages of a project. However, the difference between the two roles is rarely so distinct. Responsibilities of these professionals may include identifying the problems and needs of a street or community, collecting data (such as traffic volumes), mapping environmental constraints, designing several alternatives and facilitating selection of the preferred one, and bringing a final alternative to completion.

Working alongside planners and engineers, you may hear technical jargon and find yourself reviewing designs. These may be unfamiliar to you, but this guide will explain commonly used terms and concepts and share best practice designs to support walking and bicycling.

### RIGHT-OF-WAY

**Public land reserved for transportation and other utilities is called the right-of-way (ROW).** *Learn more about right-of-way in Section 4.1 (Concepts).*

## LOCAL BUSINESSES

Because of their visibility and value within a community, local businesses have the potential to help influence a project in one direction or another. Having a good working relationship with businesses near a potential transportation project could help you get support from the businesses, their patrons, and public officials. Businesses have good reason to support road improvements that increase walking and bicycling access: on average, people who walk or ride a bicycle to a business spend as much money or more than people who drive motor vehicles, and they visit businesses more frequently than motorists do. Improving walking and bicycling accommodations also increases customer and employee access.

Kiwanis Kool Wheels event in Keene.



## THE GENERAL PUBLIC

Of all the different groups of people listed in this section of the guide, the public will represent the broadest range of opinions toward proposed transportation improvements. Moreover, beyond varying opinions, people will vary in how much they care, how vocal they are, and how informed they are. Prepare yourself ahead of time to communicate and work with fellow community members with different interests, perspectives, and priorities than your own.

Board meeting of Seacoast Area Bicycle Riders at Rye Public Library.



## WALKING AND BICYCLING ADVOCATES

Walking and bicycling advocates, who may be members of a committee or organization or may be on their own, will have the knowledge and passion to support your efforts. They may have become involved in advocacy for a variety of reasons, but all have recognized the need for improved walking and bicycling accommodations in the community. Learning from them and working alongside them will strengthen your effectiveness. Seek these individuals and groups out by:

- Searching online for bicycle clubs or walking and bicycling advocacy organizations
- Asking your local town staff if there is a formal pedestrian or bicycle committee
- Talking to your friends and neighbors
- Visiting a local bike shop
- Going for a walk or bike ride and seeing who you come across!

“Fresh Air Fridays” walk-to-school day to the Richard Maghankian Memorial School in Brookline.



# 3

## FROM CONCEPT TO CONSTRUCTION

Three things are important to know when you are first getting involved with a transportation project:

- Transportation projects may develop through a local-level process, a state-level process, or a combination of the two. The process depends on the type of road in question and the cost and complexity of the project.
- Projects are constructed because they are desired *and* funded. Funding sources must be approved by a governing body, and the time this process takes will vary depending on the cost of the project and the level of support for it.
- Whether the road you are hoping to improve is a quiet residential street or a busy state route running through your community, begin your efforts locally. Requests to the state typically must come from a municipality.

The following sections of this chapter explain the various ways projects are funded, designed, and developed. It also explains how you can get involved.



▲ A Safe Routes to School project in Allenstown involved the construction of this new sidewalk.

### TIPS ON ENGAGING COMMUNITY MEMBERS AND DECISION MAKERS

- **Consider your audience** at any given time: Should you focus more on economic benefits or health benefits of walking and bicycling facilities? Should you use or avoid technical language?
- Being pro-pedestrian or pro-bicycle does not require you to be anti-car. **Consider all modes** of transportation, including motorized ones: people may need different modes for different purposes at different times.
- **Communicating with facts** is generally more successful than relying solely on emotion or using an argumentative tone.
- After you have begun a process, **staying engaged** is important. Showing consistent interest and energy will help you find success and will keep others motivated to support your efforts.



## 3.1 | Local Efforts

### URBAN COMPACTS

Urban compact areas are mainly occupied by homes and businesses where local municipalities have authority and responsibility over all the roads, including state-numbered highways. The municipalities permitted to have compact areas are defined in state law.



### RESOURCE

State-owned roads within urban compact areas (under local jurisdiction) are classified as Tier 5 in NHDOT's road classification system. All state-owned roads are identified by tier in the interactive [Tiers Viewer](#) on NHDOT's website.



Complete web address in the Appendix



### HOW DOES IT WORK?

Towns and cities are in charge of maintaining and constructing their local roads as well as any state-numbered highways within certain boundaries known as an **urban compact**. People and committees involved in local transportation planning may include the Town Manager, the Select Board or City Council, the Planning Department, the **Department of Public Works**, and/or a committee focused on walking, bicycling, or sustainability.

Your municipality's **Regional Planning Commission (RPC)** is another important resource, as it can serve as a liaison between your municipality and the New Hampshire Department of Transportation. Your local RPC can help you identify useful contacts and find appropriate funding. If you are not sure who to contact or how a given process works, contacting your RPC is a good start. *More information about RPCs is available in Section 3.2 (Making Institutional Changes).*

### Funding

Each municipality plans larger-scale transportation projects with a **Capital Improvement Program**, which identifies and prioritizes specific projects and potential funding sources. Capital Improvement Programs are updated annually and guide the budget for the Department of Public Works for several years into the future.

For maintenance projects that do not rise to the level of capital improvements, such as repaving a road, the Department of Public Works creates a separate schedule of transportation improvements.

In the case of new roadways for subdivisions or other private developments, the developer will fund, design, and construct the necessary roads to be consistent with the municipality's regulations.

### Planning

Roads are designed and upgraded according to local site plan regulations and road standards. **Site plan regulations** identify design requirements for districts and subdivisions, among other things. For example, they may require new developments to include walking and bicycling accommodations, or new businesses to have a certain number of off-street parking spaces. **Road standards** specify dimensions and materials for roads throughout the municipality. For example, these may dictate the width of sidewalks, bicycle lanes, and travel lanes.

Many towns and cities also have a **Master Plan**, which articulates a desired vision for the future of the municipality across many dimensions, including transportation. This document lays the foundation for the Capital Improvement Program by identifying both general and specific goals and objectives. The Master Plan will include a chapter on transportation. Some municipalities also have separate **Pedestrian or Bicycle Plans**. These documents document the existing infrastructure and identify gaps, with a goal of outlining and prioritizing maintenance and improvements.

### DEPARTMENT OF PUBLIC WORKS

**Municipal infrastructure – such as roads, parks, and underground pipes – is often maintained by the Department of Public Works. Some towns and cities may have separate departments for each type of infrastructure or have a different name for this department. Highway Department is another common term for the municipal department that constructs and maintains roads and sidewalks.**

## HOW CAN I GET INVOLVED?

You can help get walking and bicycling accommodations in your community in three ways: by ensuring accommodations are incorporated into a project already in planning, by proposing a new project, or by ensuring municipal documents like Master Plans or site plan regulations specify adequate walking and bicycling accommodations. Whichever effort you are pursuing, consider joining any local committee or community group focused on walking or bicycling as a first step. *More information on institutional efforts, such as joining a committee or updating municipal documents, is available in Section 3.2.*



▲ A volunteer stencils a shared lane marking during a Complete Streets demonstration in Swanzey.

## Affecting a project already in planning:

If there is an upcoming transportation project in your town or city, you will have different options for involvement depending on how far along the project is and what type of project it is. If it is early, you may be able to add or improve walking or bicycling accommodations. If the project is near construction, you still may be able to make small changes such as modifying striping, which would minimally affect the project cost and construction requirements.

**Examples of walking and bicycling accommodations that integrate well with other transportation projects can be found in Section 4 - Design Guide**

To learn about upcoming projects, request a list of planned projects from your town or city and review them. Large projects will be in your municipality's Capital Improvements Program, while smaller ones will be on a separate Department of Public Works list. *If a project uses state funds, read about how to get involved in the state-level process in Section 3.4 (State-Level Efforts).* You can also learn about current and upcoming projects by joining project or planning board mailing lists and checking for updates at your municipality's and Regional Planning Commission's website or in the local newspaper.

Once you have learned about upcoming projects, ask to see the plans and ask questions to the public officials in charge of the project (you may end up speaking to a local, regional, or state planner or engineer). Share your opinions and learn the perspectives of others by participating in a public meeting, joining a committee or community group already involved in the project, writing an editorial, or joining a discussion on social media.

## Starting a new project:

Before you propose a project, first check to see if any transportation improvements are planned for that location. You may be able to integrate your idea with a planned improvement and should ensure they do not conflict. If no plans are in motion for that location, follow these three steps to get your idea off the ground:

1. Figure out what design or combination of designs will be the best fit to meet the needs of the project area. *Find design ideas and criteria using Section 4.2 (Designs). Review existing Master Plans or Pedestrian/Bicycle Plans from your municipality or Regional Planning Commission to help you understand and communicate how your idea fits into the larger context.*
2. Whether or not there is already a project in the works, you will need to justify the project to the town or city staff. Developing answers to the following questions will help you refine your project and ensure you are going in the right direction:
  - Why is this project important?
  - What problem(s) does it solve? Will it reduce speeds, improve safety, provide connectivity, or meet another need?
  - Is this design the simplest, least expensive solution to the problem? If not, why is this design preferred?
  - Are there any other benefits to this project?
  - What are some potential downsides to this project, and how might those be addressed?
  - Does this project consider the future needs of the area?
3. Think of who else will benefit from your idea (such as neighbors, business owners, and people who walk or bicycle often) and get them involved. Reach out to existing committees, municipal staff, and elected officials to get your project added to the Capital Improvements Program. If the project needs funding beyond the town or city's means, read the next section to learn about how to get involved in the state funding process.



## 3.2 | Making Institutional Changes

One path to promoting walking and bicycling accommodations is to think more broadly. Rather than calling for a particular design in a specific location as soon as possible, you can help lay the foundation to support future walking and bicycling accommodations in your municipality.

### JOIN OR FORM A COMMITTEE OR COMMUNITY GROUP

Consider establishing or joining an organized group of engaged community members to enact change. The group could be focused on walking and/or bicycling needs, Complete Streets, a particular neighborhood, downtown revitalization, or another issue that your community would benefit from addressing. Such a group may be associated with your local government officially, it could serve as a “Friends” group (such as what many libraries have), or it could be a separate organization. Learn more about Complete Streets in Section 4.1.



#### RESOURCE

The [Bike-Walk Alliance of New Hampshire](#) has a number of resources available on their website, as do other similar organizations. For example, the [Bicycle Coalition of Maine](#) has published an online guide to forming a Bicycle/Pedestrian Committee.

Complete web address in the Appendix

### CONTRIBUTE TO A PLAN

Municipalities often have Master Plans they use to inform future decisions. If a Master Plan already exists, first check to see what is included in the section on transportation or land use. If walking and bicycling accommodations are not already addressed, contact a member of the Planning Department to find out how these areas of importance can be addressed. Municipal planners, a municipal committee, and/or a private consulting firm are usually the primary writers and editors, but public input is an important component.

Another option is to create a stand-alone pedestrian/bicycle plan, Complete Streets plan, or **Safe Routes to School (SRTS)** travel plan. Get support from your Regional Planning Commission to develop one, or use the regional pedestrian/bicycle plan as a tool to advocate for accommodations.

Public participation at the first public meeting for Portsmouth's Bicycle and Pedestrian Master Plan.

*“SRTS programs examine conditions around schools and conduct projects and activities that work to improve safety and accessibility, and reduce traffic and air pollution in the vicinity of schools. As a result, these programs help make bicycling and walking to school safer and more appealing transportation choices thus encouraging a healthy and active lifestyle from an early age.”*

– National Center for Safe Routes to School

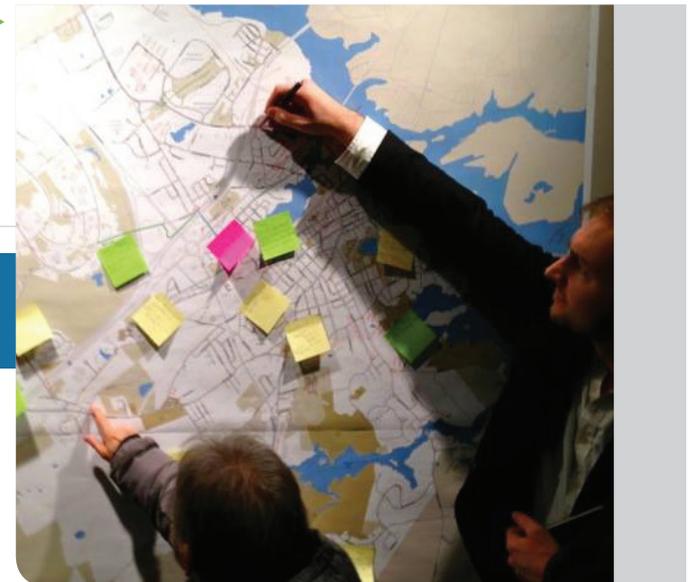
Master plans and pedestrian/bicycle plans are public information and are available on your municipality's website or from municipal staff. You can also read plans of other towns and cities in New Hampshire or in other states.



Hanover and Portsmouth have each adopted a pedestrian/bicycle plan addressing the municipality's vision, a proposed walking and bicycling network, infrastructure and non-infrastructure recommendations, and strategies for implementation.

**Hanover's Pedestrian and Bicycle Master Plan (2012)** was produced by two planning firms in conjunction with the Hanover Pedestrian and Bicyclist Advisory Committee.

**Portsmouth's Bicycle Pedestrian Plan (2014)** was produced by City planners and two planning/design firms in conjunction with the City Staff Steering Committee and the Bicycle and Pedestrian Resident Advisory Committee.



## INFLUENCE ZONING OR TRANSPORTATION POLICIES

As explained in Section 3.1 (Local Efforts), municipalities use street design standards and site plan regulations to guide future transportation projects. These standards can be modified to ensure improvements important to people who walk or ride a bicycle are made during construction of new roadways. In addition, municipal ordinances can require private developers to provide walking and bicycling access to the projects they build.

Municipalities can also implement Complete Streets policies, which formally require consideration of all transportation modes in roadway construction and rehabilitation. *Learn more about Complete Streets in Section 4.1 (Concepts).*

Talk to someone in your municipality's Planning Department or Department of Public Works to learn how the existing standards, regulations, and policies account for walking and bicycling facilities. Ask if any updates are already in the works and how you can get involved.



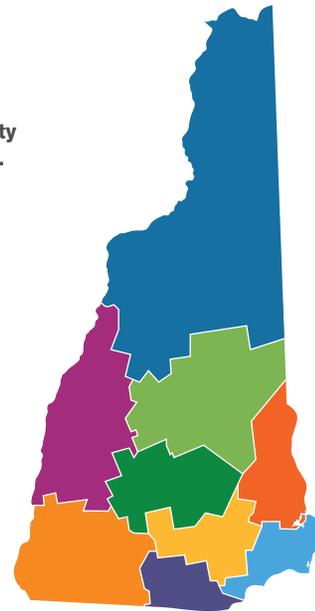
## START AN EDUCATIONAL CAMPAIGN

Informing community members of the benefits of walking and bicycling, encouraging them to take part in these active forms of transportation, and teaching road safety to those who primarily walk, bike, or drive are great ways to plant the seed for future transportation improvements. An educational campaign could be official or informal, large or small. Some ideas include:

- Work with your city or town to close off a downtown street on a Sunday to motorized traffic
- Organize an assembly at the local elementary school about bicycle safety
- Have a conversation with your friends about practicing awareness of bicyclists when driving
- Organize a community walk or bicycle ride

Use your creativity, work alongside others, and have fun!

◀ Over 30 bicycles were repaired at this community bike clinic in Manchester.



## ENSURE YOUR MUNICIPALITY IS REPRESENTED AT THE REGIONAL LEVEL

Every municipality in New Hampshire is under the domain of one the state's nine **Regional Planning Commissions (RPCs)**. Four RPCs also serve as **Metropolitan Planning Organizations (MPOs)**, which are required by the United States Department of Transportation in urbanized areas with populations of more than 50,000 people. MPOs are responsible specifically for transportation planning within these urbanized areas. RPCs support transportation and non-transportation projects within and across their regions by performing data collection and analyses, ensuring sensible allocation of state funds, preparing regional plans, reviewing developments that affect the region, and more.

Every RPC and MPO has a **Transportation Advisory Committee (TAC)**, and every member municipality should have a representative to this important committee. However, not all do. Check with your municipality to make sure it actively participates in your MPO or RPC's Transportation Advisory Committee. *More information about the TAC can be found in Section 3.4 (State Level Efforts).*

### NEW HAMPSHIRE'S NINE REGIONAL PLANNING COMMISSIONS (RPCs)

- North Country Council
- Lakes Region Planning Commission
- Upper Valley Lake Sunapee Regional Planning Commission
- Southwest Region Planning Commission
- Central New Hampshire Regional Planning Commission
- Southern New Hampshire Planning Commission  
*MPO for the Manchester Urbanized Area*
- Nashua Regional Planning Commission  
*MPO for the Nashua Urbanized Area*
- Rockingham Planning Commission  
*MPO for the Portsmouth Urbanized Area*
- Strafford Regional Planning Commission  
*MPO for the Dover-Rochester-Berwick, ME Urbanized Area*



### 3.3 | Local Public Agency Process

Towns and cities can choose to manage and construct a Federally funded local transportation project through the Local Public Agency (LPA) process. This process allows a community to receive significant financial assistance while still managing the project itself. Funding comes from a specific set of federal funds NHDOT distributes through a competitive application process in the form of grants. These funds are available for a variety of projects, including walking and bicycling accommodations and educational activities.



▲ Well-designed infrastructure encourages a full range of users (Concord).

#### HOW DOES IT WORK?

Each LPA project must have a project sponsor (such as a municipality) and a local “person in responsible charge” who manages the project. This position requires extensive knowledge of NHDOT and Federal Highway Administration procedures, so NHDOT has a certification process for those wishing to serve in this role. In addition, NHDOT provides project coordination, quality assurance, and administrative oversight to any LPA project.

The LPA design process follows three major steps: Feasibility/Engineering Study, Preliminary Design, and Final Design. Documentation of each step must be submitted to NHDOT for review and approval. As with NHDOT projects, they must undergo an environmental analysis and include opportunities for public involvement. Detailed information on the entire LPA process can be found in the [LPA Manual](#)  on NHDOT’s website.

 Complete web address in the Appendix

#### HOW CAN I GET INVOLVED?

Local Public Agency projects require two public meetings, which will be publicized in newspapers, on the municipality’s website, and sometimes on the radio. These meetings are important opportunities to participate in the process and ensure projects include provisions you care about, so if possible, plan to attend both. The first meeting occurs at the beginning of project planning. It explains the funding and project context, and it identifies local concerns. The second meeting presents results of the engineering study and shares preferred alternatives, before final design is pursued. Once a project moves to final design, it is much harder to change, so participation in these first meetings is the best time to be heard. Additional meetings are scheduled as needed to communicate potential cultural or environmental impacts or to meet with abutters about property impacts.



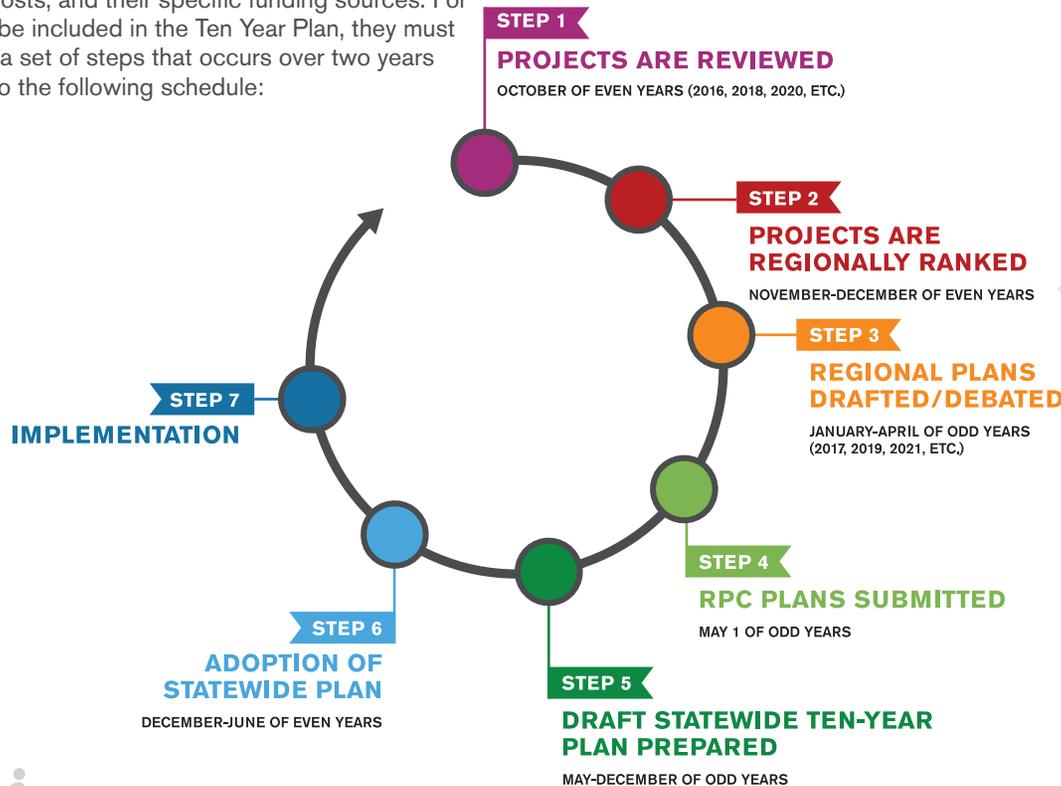
### 3.4 | State-Level Efforts

The New Hampshire Department of Transportation (NHDOT) has defined funding and project development processes. Ten years' worth of projects and their funding sources are identified during a two-year process. Once the list of projects is developed, individual projects progress from planning to construction over a time-frame that varies based on the projects' complexity and size. Public engagement occurs throughout the funding and project development processes, mainly in the form of public meetings. Regional Planning Commissions (RPCs) and their Transportation Advisory Committees (TACs) play an important role in facilitating this effort regionally.

#### HOW DOES IT WORK?

##### Funding

If you have an idea for a project in your community that requires some state or Federal funding, the project first must be added to the state's Ten Year Plan, a document listing approved transportation projects, their estimated costs, and their specific funding sources. For projects to be included in the Ten Year Plan, they must go through a set of steps that occurs over two years according to the following schedule:



**STEP 1 PROJECTS ARE REVIEWED**  
OCTOBER OF EVEN YEARS (2016, 2018, 2020, ETC.)  
Regional Planning Commissions (RPCs) review projects and evaluate them based on criteria.

**STEP 2 PROJECTS ARE REGIONALLY RANKED**  
NOVEMBER-DECEMBER OF EVEN YEARS  
The Transportation Advisory Committee (TAC) for each RPC ranks projects submitted for consideration within a few broad categories (preservation, maintenance, etc.).

**STEP 3 REGIONAL PLANS DRAFTED/DEBATED**  
JANUARY-APRIL OF ODD YEARS (2017, 2019, 2021, ETC.)  
Early in the new year each RPC's TAC develops and approves a draft of the regional priorities and recommendations for consideration for submission to the NHDOT.

**STEP 4 RPC PLANS SUBMITTED**  
MAY 1 OF ODD YEARS  
Each RPC submits its regional priorities and recommendations to NHDOT

**STEP 5 DRAFT STATEWIDE TEN-YEAR PLAN PREPARED**  
MAY-DECEMBER OF ODD YEARS  
**May-July 1:** NHDOT prepares a draft statewide Ten Year Plan using the information provided by each RPC and others, and submits it to the Governor's Advisory Commission on Intermodal Transportation (GACIT).  
**July 1-December:** After a series of statewide public hearings, the GACIT amends the Ten Year Plan and forwards it to the Governor.

**STEP 6 ADOPTION OF TEN YEAR PLAN**  
DECEMBER-JUNE OF EVEN YEARS  
The Governor reviews the Ten Year Plan and submits it to the Legislature for consideration and approval. Public hearings are held and input is considered.

**STEP 7 IMPLEMENTATION**  
After adoption by the Legislature, RPCs and Metropolitan Planning Organizations (MPOs) incorporate approved projects into their Transportation Improvement Program (TIP) and the Statewide Transportation Improvement Program (STIP) is updated.



## Planning

After funding is confirmed through the Ten Year Plan, projects are planned, designed, and constructed. NHDOT follows seven steps in this project development process. Depending on the size and scope of a project and what agency is in charge, the time these steps will take and the number of steps required may vary.

### 1 Project Scoping, Data Collection, and Coordination.

- An agency at the state, regional, or local level identifies needs in its jurisdiction and determines which projects or phases of projects to fund.
- The **project team** collects data and information about the available land, existing infrastructure, and current traffic conditions, as well as projected changes to these elements.
- The project team works with **stakeholders** to further understand the needs and purpose of the project.

#### PROJECT TEAM

Each project has a team working together to develop it. The project team will include staff from NHDOT, RPCs or local municipalities and frequently also includes contracted consulting engineers, planners, or other experts.

#### STAKEHOLDERS

Stakeholders include the people or organizations that have interest or concern in a transportation project, such as local officials, utility companies, residents, and business owners.

### 2 Preliminary Engineering Studies and Environmental Evaluation.

- The project team usually develops several alternative plans that address the findings of Step 1. Each alternative begins as a concept and is refined based on input from project stakeholders and an environmental evaluation. The environmental evaluation reviews how the project may impact archaeological sites, historic resources, endangered species, and the natural environment (including air, water, and noise quality).

### 3 Identification of a Preferred Alternative and Draft Environmental Documentation.

- The project team, with input from stakeholders, compares alternatives and selects one to advance.
- Detailed plans of the preferred design are prepared, accounting for design standards, right-of-way limitations, and other constraints.

The environmental impacts associated with the design are documented.

### 4 Formal Public Hearing Process

- Formal public hearings are typically required for large projects where significant environmental impacts are anticipated and for projects of any size where environmental impacts are unknown or right-of-way is required. Formal public hearings are generally not required for minor projects such as repaving projects.

### 5 Selected Alternative and Final Environmental Documentation.

- NHDOT addresses issues raised from public meetings or from the draft environmental document.
- Final environmental documentation and relevant permits and approvals are issued.

### 6 Development of Project Construction Plans and Right-of-Way (ROW) Acquisition.

- The project team finalizes plans for construction, which may vary from the preliminary design based on stakeholder input, further environmental analysis, and new information that may arise.
- The agency in charge of the project negotiates and purchases any needed ROW from adjacent property owners, contacts utility companies about relocations, obtains permits and authorizations as necessary, and issues a notice to proceed (NTP).

### 7 Construction of Project.

- Day-to-day management is transferred from the project team to a construction team. The construction team ensures the project conforms to plans and manages traffic flow during construction. When completed, the new construction is inspected and opened after final approval.

After a project is constructed, it must be properly maintained for the safety of its users. Depending on the road and the specific project, the municipality or state may have this responsibility, which may include repainting, repaving, plowing snow, clearing debris, and staying on top of other safety issues as they occur.



Due to the National Environmental Policy Act of 1969 (NEPA), projects are categorized as Class I, II, or III depending on their scope of work and anticipated environmental impact. A project's class determines the extent of its environmental evaluation process and opportunities for public involvement.

NEPA PROJECT CLASSIFICATION	GENERAL SCOPE OF WORK	ENVIRONMENTAL EVALUATION PROCESS	PUBLIC INVOLVEMENT
<p><b>CLASS I</b></p>	<p><b>Large scale construction</b></p> <ul style="list-style-type: none"> <li>▪ In a new location or involving substantial widening</li> <li>▪ Anticipation of significant environmental impacts.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Requires an Environmental Impact Statement (EIS) to be prepared, reviewed, and approved</li> <li>▪ An EIS includes detailed descriptions of the project scope, design alternatives, and the anticipated environmental impacts of the alternatives</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public advertisement of EIS availability</li> <li>▪ 45-day comment period and hearing</li> <li>▪ Public informational meetings</li> <li>▪ Outreach via the web and social media</li> </ul>
<p><b>CLASS II</b></p> <p><b>“Categorical Exclusion”</b> <b>(Over 90% of projects)</b></p>	<p><b>Minor projects</b></p> <ul style="list-style-type: none"> <li>▪ Examples: Resurfacing, restoration, transportation enhancement, etc.</li> <li>▪ No significant environmental impacts</li> </ul>	<ul style="list-style-type: none"> <li>▪ No Environmental Impact Statement or Environmental Assessment (EA) is required</li> <li>▪ NHDOT does prepare a less detailed environmental study</li> </ul>	<ul style="list-style-type: none"> <li>▪ Town officials are notified</li> <li>▪ Public informational meeting usually held</li> </ul>
<p><b>CLASS III</b></p>	<p><b>Major reconstruction or minor relocation projects</b></p> <ul style="list-style-type: none"> <li>▪ Unknown environmental impacts</li> </ul>	<ul style="list-style-type: none"> <li>▪ Requires an Environmental Assessment (EA) to determine if an EIS is required</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public advertisement of report availability</li> <li>▪ 30-day comment period</li> <li>▪ Public informational meetings</li> <li>▪ Outreach via the web and social media</li> </ul>



## HOW CAN I GET INVOLVED?

As with local projects, you can help get walking and bicycling accommodations in your community by proposing a new project or ensuring accommodations are incorporated into a project already in planning.

For a project you are proposing, you will need to participate in the Ten Year Plan process so it will receive funding, after which you can participate in the project development process.

You can influence the **Ten Year Plan** in two important ways:

- Attend your Regional Planning Commission (RPC) or Metropolitan Planning Organization's (MPO) **Transportation Advisory Committee (TAC)** meetings or reach out to your municipality's representative to the TAC. TACs decide which projects to recommend to the state from November to April every other year (Steps 2 and 3 of the Ten Year Plan cycle), but TAC meetings also occur on a regular basis.

**While every municipality is allowed to send representatives to their RPC or MPO's TAC, not all do. Make sure your municipality actively participates in this important committee.**

- Attend **Governor's Advisory Commission on Intermodal Transportation (GACIT)** hearings. Approximately two dozen hearings are held throughout the state from July to December of odd numbered years (Step 5 of the Ten Year Plan cycle), but you will likely only need to attend the one in your region for your voice to be heard.

If you are getting involved with a project already in the Ten Year Plan that has progressed to the planning stages, you will want to participate as early as possible in the project development process. Several walking and bicycling accommodations integrate into various road projects without much added expense or complication. *These accommodations are identified in Section 4.2 (Designs).* You can learn about such projects by paying attention to updates to your regional planning commission's Transportation Improvement Plan (TIP), the State Transportation Improvement Plan (STIP), or the Ten Year Plan. The project scope may not be able to include even small changes, but the earlier in the process you get involved, the easier it will be to alter the project and the less costly changes will be. Once a project is under construction, it is probably too late for design changes, but striping modifications might be possible.



Whether you are proposing a new project or changes to an existing one, there are opportunities for public involvement throughout the **project development process**:

- At the beginning of this process (Step 1), join the project's mailing list, and consider joining any local or regional committee or community group focused on walking or bicycling to collaborate with people with similar goals. Find these groups by asking planning board staff in your municipality or by searching online.
- Throughout the process (Steps 1-6), attend public meetings and get other community members involved.
- Once collected data and preliminary plans are available (Steps 1-3), review them and provide specific input on design features and alternatives as soon as possible.
- As plans are further developed (Steps 3-5), monitor for changes from the preliminary plans. Comment on recently added details of the plans, and bring up unaddressed concerns and ideas.
- Once construction is completed (Step 6), check for any problems, recognize and thank officials, and publicize the project. In the long term, support maintenance efforts to ensure the facilities are usable in all seasons by all users.

◀ **The STIP and Ten Year Plan can be found at NHDOT's website. Project updates are posted in the form of plan amendments or updates, as well as in an interactive map - NHDOT's [Project Viewer](#) in its Project Information Center.**



# 4

## DESIGN GUIDE

Whether you are looking to improve walking facilities, bicycling facilities, or both, and whether you have a simple request or a more comprehensive redesign in mind, understanding a few key concepts of transportation planning and knowing where to look for further information will be helpful. This section will help you answer questions you might not have already considered, such as:

- What are some reputable resources for my research?
- What transportation vocabulary should I know?
- How wide should a bike lane or sidewalk be?
- What are simple and cost-effective walking and bicycling accommodations?
- What are some innovative design options?

An ability to answer these questions will help you advocate for designs that meet the needs of your community.



▲ Lake Massabesic Group Ride.

## 4.1 | Concepts



### RESOURCE:

A helpful tool for visualizing different cross-section designs within the right-of-way is [streetmix.net](http://streetmix.net). After first inputting the total available width, you can add, remove, or change the width of travel lanes, bike lanes, sidewalks, and green space, and include other features like bike racks and bus stop shelters.



### RIGHT-OF-WAY

Every street has a particular right-of-way (ROW) – space the municipality or state has jurisdiction over and responsibility to manage. The right-of-way may contain travel lanes, curbs, sidewalks, green space, utility lines, fire hydrants, and more. The boundaries of the right-of-way are not obvious – they may coincide with the outside of a sidewalk or other street-related feature, or they may be farther away. Regardless, they are always defined on maps available in the town or city's records. When working to add or improve walking and bicycling accommodations, the right-of-way is the space with the greatest potential to be changed through a public process. A town or city can purchase private land to fit a project's design, but this requires a longer process and only works in certain situations.

### CONTEXT SENSITIVE SOLUTIONS

You may also hear the term Context Sensitive Solutions (CSS) when working to improve infrastructure. The Federal Highway Administration defines CSS as “a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility.” When designing according to CSS, streets are considered more than just a corridor for transportation; they are public spaces with the ability to preserve or improve aspects of a community.

### COMPLETE STREETS

*“Complete Streets are streets for everyone.”*  
– Smart Growth America

When you think of a street, a car may be the first mode of transportation that comes to mind; most streets in America have been designed to prioritize motor vehicles. However, as public officials and transportation professionals have increasingly recognized the benefits of alternative modes of transportation, streets are now being designed with a more balanced approach. That approach is called Complete Streets, which considers safety and access for all users, regardless of age, ability, or mode of transportation.



Several communities in New Hampshire have adopted Complete Streets policies in recent years, including Concord, Portsmouth, Dover, Keene and Swanzey.

Dover's policy *Complete Streets and Traffic Calming Guidelines (2014)* is a concise, easy-to-understand document that may be helpful to read as a summary of what Complete Streets are and how they can be applied in a community.

Other communities with Complete Streets policies can be found in [Smart Growth America's Policy Atlas](#).



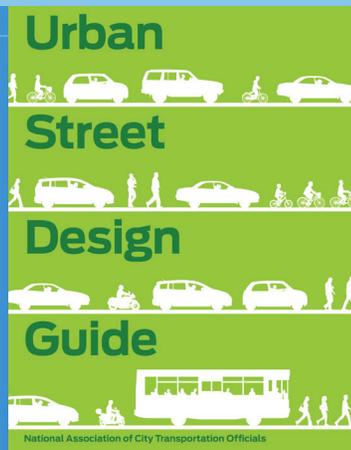
## TRAFFIC CALMING

Accommodating pedestrians and bicycles does not necessarily involve walking or bicycling facilities. One method to help make a street, intersection, or neighborhood safer for people walking and bicycling (as well as driving!) is to slow down motor vehicle speeds. Unfortunately, reducing speeds is usually not as simple as installing speed limit signs with a lower value. Typically, changes to the roadway – called traffic calming measures – are required to achieve this goal. Examples of traffic calming measures range from familiar, widely used measures like bulb outs, to less common measures like mini roundabouts.



### RESOURCE

An illustrated list of traffic calming measures can be found in the *Urban Street Design Guide*, a free, online ([nacto.org](http://nacto.org)) resource published by the National Association of City Transportation Officials (NACTO). See the Appendix for more information on NACTO and its publications.



Complete web address in the Appendix

## ACCESSIBILITY

Walking and bicycling accommodations can benefit community members who are challenged with visual, auditory, or physical impairments through the use of **universal design**. While many design features that address these needs are required by the Americans with Disabilities Act (ADA) and will be integrated into a project with or without public involvement, these features are sometimes not applied correctly due to a misunderstanding of the needs of people with disabilities. In addition, minimum requirements sometimes fall short of what might be truly useful. If you are advocating for a project in a neighborhood with someone with a disability, researching options and communicating with that person to fully understand how the project can address their needs will help ensure the design is accessible to all.

Celebration of the opening of the Irving and Bernice Singer Memorial Bridge, which connects the Piscataquog Trail with the Goffstown Rail Trail.



## UNIVERSAL DESIGN

Universal design refers to transportation facilities and services that accommodate the widest range of potential users. This form of design helps people with particular needs, but also benefits other road users. For example, a ramp can benefit a person in a wheelchair, as well as a parent with a stroller and a person carrying a heavy load. Auditory pedestrian signals at crosswalks (that chirping sound or “wait” on repeat) can benefit a blind person, as well as someone only slightly visually impaired and someone simply not paying complete attention.



## 4.2 | Designs

When promoting the implementation of a walking or bicycling accommodation, you are not expected to design the facility itself, nor do you need much technical knowledge. Simply knowing you would like a new sidewalk and requesting one may be enough. However, the more you know, the more skilled you will be at advocating for new or improved facilities. You will feel more comfortable communicating with planners and engineers, you will be able to request specific design features that make sense in your community, and you will be able to better understand the possibilities and limits of your ideal design. This section of the guide explains basic design considerations and directs you to specific resources to learn more.

### INCLUDED IN THIS SECTION:

- **Operating Space:** This first page explains the basic criteria involved with designing a roadway for various types of users.
- **Walking and Bicycling Accommodations:** The rest of the Design Guide identifies and explains various design options for people who walk and ride bicycles. The designs are split into the following categories:
  - Pedestrians at Intersections
  - Pedestrians at Mid-Block Crossings
  - Bicycles Along Streets
  - Bicycles at Intersections
  - Multi-Modal Accommodations
  - Easily Added Walking and Bicycling Accommodations
  - Other Accommodations

A transportation planner from the Southern New Hampshire Planning Commission shares a draft version of the NHDOT's bicycling stress map at a Bike Manchester meeting.



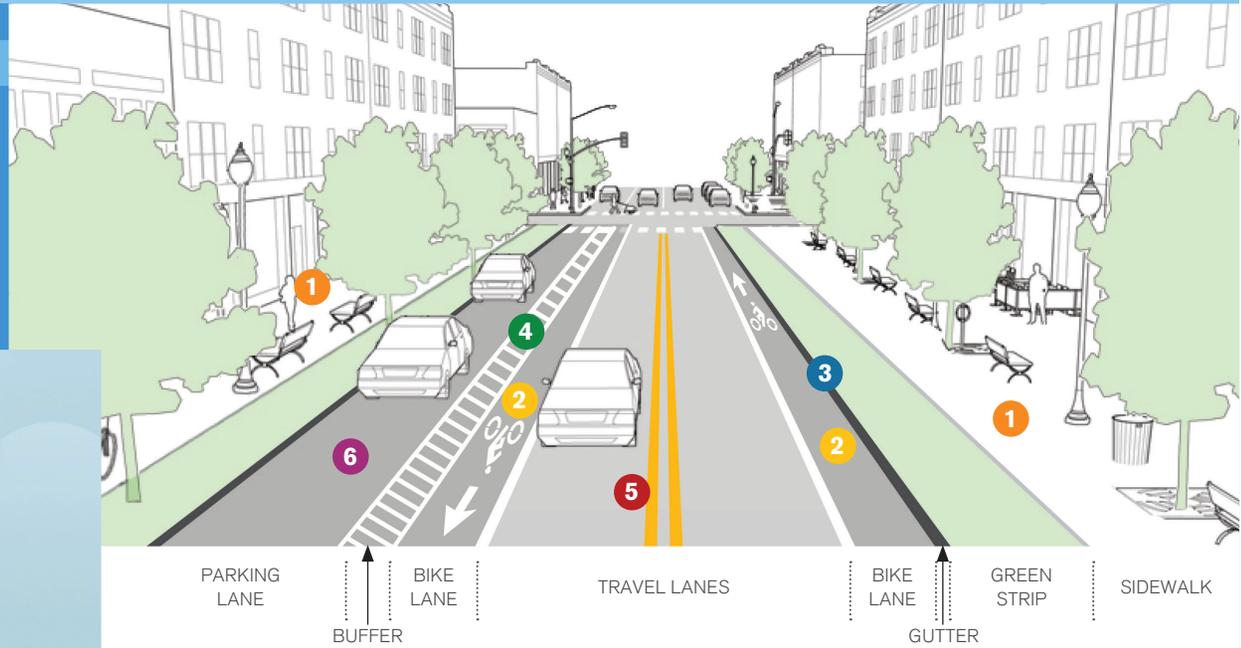
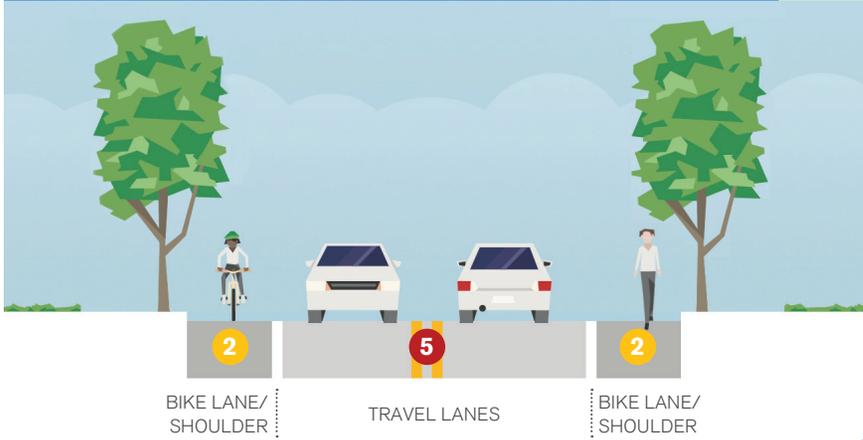
### **i** TIPS

#### MAKING YOUR WAY AROUND THE TECHNICAL SIDE OF THINGS:

- Walking and bicycling facilities are often two-dimensional, making them easier to understand, sketch, and discuss.
- Variations of walking and bicycling facilities are all around you. Keep an eye out for them, and walk, bike, or drive to the downtowns of communities with Complete Streets policies (identified earlier).
- If you prefer to be more involved with public engagement but are not comfortable with the technical aspects, team up with other local walking and bicycling enthusiasts. Everyone can play to their skills and interests.
- Ask the project team questions.

## OPERATING SPACE

Pedestrians, bicycles, and motor vehicles all need a minimum amount of space to operate, and more space in certain cases. Knowing the minimum operating space necessary and understanding when additional space is needed will help you advocate for a practical design considerate of all modes of transportation.



### Pedestrians

Pedestrian accommodations should be at least wide enough for two people on wheelchairs to pass each other. Therefore, sidewalks **1** should be **at least 5 feet wide and preferably 6 feet wide**. This width does not include space used for things like street signs, mailboxes, outdoor seating, and bicycle racks. In a downtown area or near a school, a sidewalk may be much wider than 6 feet.

### Bicycles

A person riding a bicycle needs at least 3 feet of rideable surface. Therefore, bike lanes **2** should generally be **4 to 6 feet wide** since the edge of a road is often not rideable due to storm drainage or accumulated debris in the gutter **3**. When a bike lane is adjacent to a parking lane, a painted buffer **4** is helpful to prevent “dooring”.

### Motor Vehicles

**5** Travel lanes can be as narrow as **10 to 11 feet**, and as little as 9 feet on some local roads, provided these dimensions are appropriate for the traffic volumes and speeds. Traditionally, travel lanes have been designed with widths of at least 12 feet and sometimes as wide as 16 feet, which comfortably accommodate higher speeds. Narrower lanes create a safer environment for bicyclists and pedestrians and open up space within the public way for walking and bicycling accommodations.

**6** Parking lanes can be as narrow as **7 to 8 feet**.

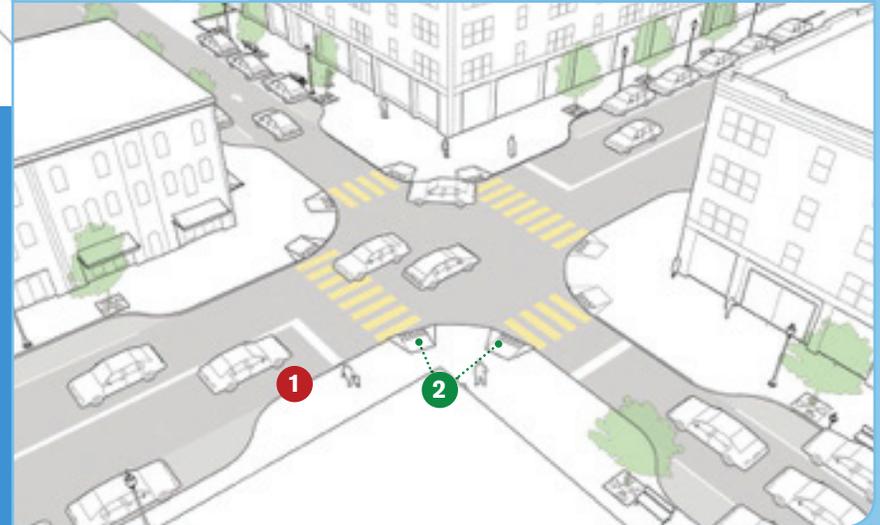


## BICYCLE AND PEDESTRIAN ACCOMMODATIONS

There are many different types of walking and bicycling accommodations, and even more ways to implement them. Some are traditional and some are innovative, some are complex but many are simple, some are widely used and others less so. Choosing the right design (or combination of designs) depends on several different factors, including need, available space, context, available funds, and level of support (especially when the trade-off is removing vehicle parking or reducing travel lane widths). Some accommodations will be ideal designs but perhaps too expensive or require too much space, and others will not be your first choice yet are a more feasible alternative. Key walking and bicycling accommodations are shown on the next few pages.



▲ Intersection before bulb-outs and accessible curb ramps



▶ After

## Pedestrians at Intersections

Pedestrians are most vulnerable at intersections, where they cross paths with motorized vehicles. When designing intersections to accommodate pedestrians, consider the pedestrian's experience and the driver's perspective.



### KEEP IN MIND:

- **Guidance for walking and bicycling accommodations has changed over the years and will continue to be updated in the future.**
- **Determining the right options for pedestrian and bicycle facilities is an art as much as a science.**
- **Public input – especially from anyone who walks and rides bicycles locally – holds a lot of value.**
- **It may make sense to have in mind a less expensive alternative to your ideal design.**

- 1 Bulb-outs** are curb extensions that take advantage of unused space at the corners of an intersection where parking lanes end. They make intersections safer for pedestrians by:
  - Reducing their crossing distances
  - Making pedestrians more visible to motor vehicles and vice-versa
  - Slowing down traffic
- 2 Accessible ramps** are required by the Americans with Disabilities Act (ADA) at all crosswalks and should be aligned to face the crosswalk rather than the center of the intersection.

At crossings with traffic signals:

- An **exclusive pedestrian phase** allows pedestrians to cross any leg of the intersection, and motor vehicles are not permitted to enter the intersection. This is the safest option, but it does reduce how many vehicles can pass through the intersection during a signal cycle.
- A **leading pedestrian interval** allows pedestrians to start crossing the intersection before motor vehicles traveling in the same direction are given the green light. This head start makes them more visible to drivers.
- A sign restricting motor vehicles from turning right on red during opposing WALK signals reduces conflicts between vehicles and pedestrians.



## Pedestrians at Mid-Block Crossings

Pedestrians can be accommodated in several ways at road crossings where there are not street intersections:



**1 Median refuge islands** give pedestrians an opportunity to cross only one direction of traffic a time.

**2 Raised crosswalks** make pedestrians more visible to drivers and cause drivers to slow down when approaching the crossing.

**3 Advanced yield lines** provide warning to drivers that they should be slowing down ahead of the crosswalk.

To further enhance pedestrian safety, consider the following signalized pedestrian crossing devices:



▲ (Lebanon)

**Rectangular rapid flashing beacons (RRFBs)** are proven to increase the number of drivers who yield to pedestrians. To cross, pedestrians press a button to immediately activate the flashing of the RRFBs.



▲ (Hanover)

**Pedestrian-actuated signals** are regular traffic signals that are only activated when pedestrians need to cross.



▲ (Epping)

**Pedestrian Hybrid Beacons** use overhead signals to regulate drivers in conjunction with typical pedestrian signals to guide crossing pedestrians. The overhead signals are only lit when activated by a pedestrian, and their sequence of lights are different from regular traffic signals.

## Bicycles Along Streets



### ◀ (Concord) *Sharing a Lane with Motorized Traffic:*

**Shared Lane Markings.** “Sharrows” can be used to remind drivers about the presence of bicyclists within the travel lane.

**Wide Curb Lanes.** A wide curb lane is a driving lane adjacent to the curb wide enough for a motor vehicle and a bicycle to ride alongside each other, but not wide enough for two motor vehicles to fit side-by-side.



### ◀ (Manchester) *Bicycle Lanes:*

**Conventional bike lanes.** Bike lanes are on-road lanes exclusively for bicycles, separated from the travel lanes with a single white stripe. They may or may not also have a painted buffer separating them from motorized traffic. If they do, they are called buffered bicycle lanes.

**Contraflow bike lanes.** One-way streets can be two-way streets for people riding bicycles by painting conventional bike lanes to the right of motorized traffic and contraflow lanes on the opposite side. Contraflow lanes are separated from motorized traffic with double yellow striping.



### ◀ (Keene) *Physically Separated from Motorized Traffic:*

**One-Way Protected Cycle Tracks.** Cycle tracks are bike lanes with a physical buffer separating them from motorized traffic. They are more likely to be used by people of all ages and abilities than conventional bike lanes.

**Two-Way Protected Cycle Tracks.** Two-way cycle tracks are wide enough for two bicycles to pass each other and may or may not have a dashed line in the middle to delineate direction of travel. They are often used when space does not permit one-way cycle tracks on each side of the road.

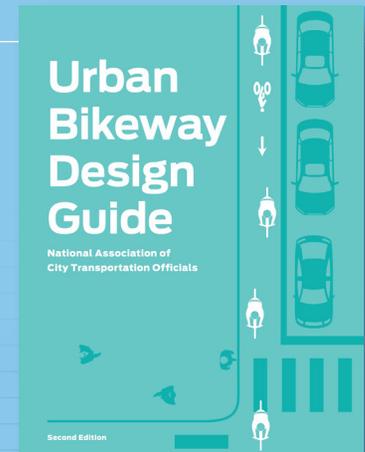
There are several types of buffers that can be used to physically separate bicycles from motorized traffic:

- Bollards
- Planters
- Planted strips
- Parking lanes
- Cycle tracks can also be separated vertically; they can be raised up several inches, similar to how sidewalks are treated.



## RESOURCE

Many bicycle accommodations are explained and illustrated in the **Urban Bikeway Design Guide**, published by the National Association of City Transportation Officials (NACTO). Like NACTO's **Urban Street Design Guide** mentioned earlier, this guide is a free, online resource. See the **Appendix** for more information.



## Bicycles at Intersections

If bicyclists feel safe riding in a bike lane or on a cycle track, they should feel equally as safe when crossing intersections along their routes. The following accommodations are for signalized intersections.



**1 Crossing markings** guide bicyclists safely through an intersection and increase awareness to drivers that bicyclists may be crossing. Markings may be as simple as dashed white lines marking the boundary, or they can have colored pavement or sharrows within them.

**2 Bike boxes** – preferably colored green – designate a space ahead of the motor vehicle stop line where bicyclists can wait for the green light.



**Bicycle signal heads** are used in conjunction with existing traffic signals to indicate bicycle-specific timing sequences.



Traffic signals can use **bicycle detection** to cause the signal to turn green when a bicyclist is waiting at the stop line. This can be done automatically or the bicyclist can use a push-button. When automatic detection is implemented, striping should indicate where the bicyclist needs to stop to trigger the detector.



## Other Accommodations

The accommodations identified so far focus almost entirely on the safety of people walking and bicycling. They include lanes, paths, and crossings designated by paint, asphalt, or physical buffers, as well as options for signs or signals. Most must be designed based on certain engineering rules and guidelines (*see the Appendix*) that specify allowable materials, dimensions, patterns, and colors.

Other accommodations for people traveling by foot or bicycle can increase safety but also provide opportunities for unique designs and community involvement. The following are some examples:



### ▲ (Keene)

**Wayfinding.** Wayfinding signs direct people along walking/bicycling routes and to destinations that are accessible by foot or bicycle. They often include the travel distance and sometimes the estimated travel time.



### ▲ (Portsmouth)

**Bike racks.** Just as motor vehicles use parking lots, driveways, and on-street parking, people riding bicycles need infrastructure to secure their bicycles when they arrive at their destinations or make stops along the way. When bike racks are not present, people must resort to locking their bicycles to less desirable and sometimes illegal alternatives, such as trees and hand railings.



### ▲ (Concord)

**Benches.** Benches provide a place for people walking or bicycling to rest and relax mid-journey or upon arrival. Having the option to sit can make a path or downtown area much more inviting to people of all ages and physical abilities.



◀ (Manchester) **Street lighting.** When designed properly, human-scaled street lighting not only provides additional safety for people walking and bicycling, but also emphasizes to drivers that the street may have higher pedestrian and bicyclist activity.



### ▲ (Keene)

**Parklets.** A parklet is an extension of a sidewalk that replaces one or more parking spaces and typically accommodates outdoor seating, plantings, and/or bike racks when the existing sidewalk is not wide enough. Rather than extending the actual curb and sidewalk, they are built out of flat structures (often made of wood panels) and are placed on low pedestals to keep the surface level with the sidewalk.



## Multi-Modal Accommodations

People walking, bicycling, and driving can share public space instead of completely separating these modes of transportation.

- **Mixed-use paths** are designed for people walking, jogging, bicycling, roller-skating, skateboarding, and taking part in other forms of muscle-powered transportation. They may be within a street's right-of-way or in their own right-of-way, such as a rail trail.
- **Suggestion lanes** can be used on narrow, low-volume streets where there is not enough space for two lanes of traffic and two sidewalks or bicycle lanes. They use dashed lines to encourage people to walk or bicycle on the sides and to drive down the middle. There is only room for one vehicle to drive between the dashed lines, so when an oncoming vehicle approaches, they each may pass each other by temporarily crossing into the bicycle zone, after yielding to any people walking or bicycling.
- **Bicycle boulevards** are streets that allow motor vehicles but give bicycles priority. They have signs and pavement markings to designate them as such, and they use various techniques to discourage motor vehicle traffic and to reduce traffic speeds. They can be designed very simply or with more complex features.
- **Shared spaces** are streets that give equal priority to pedestrians, bicycles, and motor vehicles without separating these modes of transportation. A sign at each entrance to the street informs travelers to share the road, and a very low speed limit may be posted. Shared spaces typically have textured pavement to emphasize the point, and there are no raised curbs or lane markings.



▲ Different facilities work better in different environments. These two examples (both in Hanover) illustrate how one community has used different accommodations on different roadways. The top photo is a separated mixed-use path along NH 10; the bottom photo illustrates suggestion lanes on a neighborhood road.

## EASILY ADDED WALKING AND BICYCLING ACCOMMODATIONS

If your community is in the process of designing an approved transportation project, it may not be too late for walking and bicycling accommodations to be incorporated into the plans. However, the accommodations likely cannot have a significant impact on the time-line or budget of the project. Fortunately, some accommodations may be able to be integrated into a transportation project with minimal additional cost or effort. The following are some possibilities.

- For simple repaving projects (or any larger project that includes repaving), consider lane space reallocation. Each time a road is repaved, it is also restriped. If the lanes are wide and the shoulders are narrow or non-existent, it may be possible for the new striping to have narrower lanes and wider shoulders to provide space for pedestrians and bicycles. This will minimally change the project cost.
- During any intersection reconfiguration, crosswalks, bike boxes, and bike crossing markings can be added and may only require paint.
- If new traffic signals are being installed, request the inclusion of an exclusive pedestrian phase, a leading pedestrian interval, or bicycle detection.



## APPENDIX



### LINKS

The following website addresses are for various resources and organizations mentioned throughout the guide.

#### **Page 7:**

NHDOT's Tiers Viewer

<http://nh.maps.arcgis.com/apps/webappviewer/index.html?id=1d83377ccf4d4236bb11f3de2b82eab5>

#### **Page 9:**

Bike-Walk Alliance of New Hampshire

<http://bwanh.org/>

Bicycle Coalition of Maine's Form a Bike/Ped Committee

<http://www.bikemaine.org/forming-a-bikeped-committee>

National Center for Safe Routes to School

<http://www.saferoutesinfo.org>

Hanover's Pedestrian and Bicycle Master Plan

<https://hanoverbikeped.files.wordpress.com/2013/01/plan-final-complete.pdf>

#### **Page 11:**

NHDOT Local Public Agency Guide

<https://www.nh.gov/dot/org/projectdevelopment/planning/documents/LPAManual.pdf>

#### **Page 15:**

NHDOT Project Viewer

<http://gis.dot.nh.gov/projectviewer>

#### **Page 17:**

streetmix

<http://streetmix.net/-/378184>

Smart Growth America Policy Atlas

<http://www.smartgrowthamerica.org/complete-streets/changing-policy/complete-streets-atlas>

#### **Page 18:**

NACTO

<http://nacto.org>

## TRANSPORTATION PLANNING AND ENGINEERING RESOURCES

The following table identifies a list of guides and other resources commonly used by transportation planners and engineers.

AGENCY OR ORGANIZATION	RESOURCE	DESCRIPTION	AVAILABILITY
<p><b>American Association of State Highway and Transportation Officials (AASHTO)</b></p> <p>National standards-setting body made up of state department of transportation (DOT) officials</p>	<p><i>A Policy on Geometric Design of Highways and Streets (the "Green Book")</i></p> <hr/> <p><i>Guide for the Development of Bicycle Facilities</i></p> <hr/> <p><i>Guide for the Planning, Design, and Operation of Pedestrian Facilities</i></p>	<p>The Green Book contains the latest research and best practices for the geometry of highways and streets. In this case, "geometry" includes things such as the minimum radius of a curve in the road, the width of shoulders, and the dimensions of a roundabout. Several chapters of the Green Book include a section about walking and bicycling facilities. However, the Green Book generally leaves details related to walking and bicycling facilities to two other AASHTO guides: the Guide for the Development of Bicycle Facilities and the Guide for the Planning, Design, and Operation of Pedestrian Facilities.</p>	<p>Available for purchase at <a href="http://bookstore.transportation.org">bookstore.transportation.org</a></p>
<p><b>National Association of City Transportation Officials (NACTO)</b></p> <p>A non-profit association that represents large cities in North America on transportation issues</p>	<p><i>Urban Street Design Guide</i></p> <hr/> <p><i>Urban Bikeway Design Guide</i></p>	<p>NACTO has developed two interactive guides that address a comprehensive range of transportation concepts and design features in easy-to-understand ways. Despite NACTO's focus on large cities, many of the designs, concepts, and values can apply to smaller towns as well.</p>	<p>Interactive version available online at <a href="http://nacto.org">nacto.org</a></p>
<p><b>Federal Highway Administration (FHWA)</b></p> <p>A division of the United States Department of Transportation that specializes in highway transportation.</p>	<p><i>Manual on Uniform Traffic Control Devices (MUTCD)</i></p> <hr/> <p><i>Incorporating On-Road Bicycle Networks into Resurfacing Projects</i></p>	<p>The MUTCD contains standards for all signs, signals, and pavement markings. It addresses when these are appropriate to use, what their dimensions are, and how to implement them. Part 9 of the MUTCD, Traffic Control for Bicycle Facilities, identifies signs, signals, and markings specific to bicycle traffic.</p> <p>This new workbook highlights existing guidance, justifications, and best practices for providing bikeways during resurfacing projects.</p>	<p>Available online at <a href="http://mutcd.fhwa.dot.gov">mutcd.fhwa.dot.gov</a></p> <p>Available online at <a href="https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/resurfacing/">https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/resurfacing/</a></p>



AGENCY OR ORGANIZATION	RESOURCE	DESCRIPTION	AVAILABILITY
<p><b>Transportation Research Board (TRB)</b> A division of the National Research Council of the United States</p>	<p><i>Highway Capacity Manual (HCM)</i></p>	<p>Transportation engineers use guidelines and calculation methods in the HCM to determine if a roadway or intersection is large enough to handle existing or expected motorized traffic. While mainly focused on motor vehicles, the HCM also addresses pedestrian and bicycle traffic.</p>	<p>Available for purchase at <a href="http://hcm.trb.org">hcm.trb.org</a></p>
<p><b>States and Municipalities</b></p>	<p><i>Varies</i></p>	<p>States and municipalities may have their own sets of guidelines to supplement the above resources. The NHDOT has a highway design manual, and individual municipalities may also have local guidelines, policies, and procedures.</p>	<p>NHDOT manual available online at <a href="https://www.nh.gov/dot/org/projectdevelopment/highwaydesign/designmanual/">https://www.nh.gov/dot/org/projectdevelopment/highwaydesign/designmanual/</a></p>
<p><b>United States Access Board</b> A federal agency that promotes equality for people with disabilities, partially by developing guidelines and standards for the built environment.</p>	<p><i>Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way</i></p>	<p>This document provides guidelines for the design, construction, and alteration of pedestrian facilities in the public right-of-way to ensure that these facilities are readily accessible to and usable by pedestrians with disabilities.</p>	<p>Available online at <a href="https://www.access-board.gov/attachments/article/743/nprm.pdf">https://www.access-board.gov/attachments/article/743/nprm.pdf</a></p>



## MORE INFORMATION ON STATE-LEVEL TRANSPORTATION PLANNING

The following table identifies five NHDOT bureaus especially relevant to walking and bicycling infrastructure on state-maintained roads.

DIVISION	BUREAU	DESCRIPTION
<b>Aeronautics, Rail &amp; Transit</b>	Bureau of Rail and Transit	Coordinates within NHDOT and acts as a liaison to communities and the public regarding bicycle and pedestrian transportation.
<b>Division of Project Development</b>	Bureau of Planning and Community Assistance	Provides assistance to communities administering federally-funded projects. The Bureau also administers the Transportation Alternatives Program (a federal program that provides funding for projects focused on non-motorized modes of transportation) and Safe Routes to School program, and it oversees the development of the state's Ten Year Transportation Improvement Plan.
	Bureau of Highway Design	Responsible for overseeing the engineering and design of improvement projects, including the integration of motor vehicle, bicycle, and pedestrian transportation.
<b>Division of Operations</b>	Bureau of Traffic	Responsible for striping, signals, and signs.
	Bureau of Highway Maintenance	Responsible for maintaining roads and doing resurfacing and reconstruction projects.

A relevant state bureau outside of the NHDOT is the **Bureau of Trails**, which is in charge of off-highway recreational vehicle trails, rail trails, and snowmobile trails in the state's jurisdiction. The Bureau of Trails is within the Division of Parks and Recreation, which is one of four divisions with the New Hampshire Department of Resources and Economic Development (NH DRED).



## GLOSSARY OF TERMS

The following is a list of terms and definitions used in transportation planning and design. Some terms are not referred to within this guide, but they still may be helpful during your efforts to promote walking and bicycling accommodations.

**American Association of State Highway and Transportation Officials (AASHTO):** National standards-setting body made up of state department of transportation (DOT) officials

**Americans with Disabilities Act (ADA):** Law prohibiting discrimination and guaranteeing access to public facilities for people with disabilities.

**Annual average daily traffic (AADT):** The annual number of vehicles on a road divided by 365 days.

**Arterial road:** A moderate- or high-capacity road carrying traffic between or through urban areas.

**Average daily traffic (ADT):** Average number of vehicles on a road passing a specific point both ways in a 24-hour period.

**Bicycle Level of Service (BLOS):** Estimate of bicyclist's comfort level based on several variables; BLOS ranges from A (representing a high degree of comfort) to F (representing a low degree of comfort for bicyclists).

**Capital Improvement Program (CIP):** A municipality's list of future projects and potential funding sources.

**Collector road:** A road that carries traffic from local roads to arterial roads.

**Complete street:** A street designed and operated to enable safe travel for all users, including pedestrians, bicyclists, transit-riders, and motorists.

**Context Sensitive Solutions (CSS):** An approach to transportation design that takes all aspects of local context into consideration.

**Contraflow:** Travel in the opposite direction to traffic.

**Cover sheet:** The first sheet of a set of engineering drawings containing project information.

**Cross section:** A cut-through view of the road surface perpendicular to the centerline (see also profile).

**Curb:** A raised-concrete border forming a part of the gutter at the edge of the road, typically located at the corners of street intersections.

**Curb radius:** The form of the curved raised-concrete edge joining intersecting curbs.

**Curb ramp or cut:** A ramp leading smoothly from a sidewalk or trail to a street.

**Department of Public Works (DPW):** A municipal department that maintains public infrastructure, including roads, parks, and underground utilities.

**Design/build:** The practice of using a single contractor to design and build a road project.

**Design speed:** The speed for which roadway elements such as curves are designed to allow motor vehicles to travel safely.

**Detail drawings:** Drawings that depict the planned road facilities. Also known as engineering drawings or plans.

**Easement:** A legal right to use land owned by another. Used sometimes for paths and utilities.

**Federal Highway Administration (FHWA):** A division of the United States Department of Transportation that specializes in highway transportation.



**Final design:** Preparation of final detailed engineering drawings for review and approval.

**Functional classification:** The federal government's system of categorizing roads in the United States.

**Governor's Advisory Commission on Intermodal Transportation (GACIT):** A commission in New Hampshire made up of the five executive councilors and the Commissioner of the NHDOT.

**Gutter pan:** Concrete channel next to the curb for carrying runoff, typically 1-2 feet wide.

**Highway Capacity Manual (HCM):** Contains computations for the design performance of motor vehicle volumes on roads, published by the TRB.

**Lane:** A division of roadway intended for movement of vehicles in a single direction.

**Left-turn lane:** A lane dedicated to left-turning vehicles.

**Level of Service (LOS):** An estimate of the service quality of a road facility under certain operating conditions based on traffic delay and congestion, with A representing the best and F the worst service quality.

**Line of sight:** A straight line from the eye of the driver or bicyclist to a potential object in the road ahead.

**Local Public Agency (LPA):** A process that allows a community to receive state funding for a transportation project while still managing the project itself.

**Local road:** A road that typically has very low volumes, usually in residential or very rural areas.

**Manual on Uniform Traffic Control Devices (MUTCD):** A document with standards regarding the design of and justification for traffic signs, road markings, and signals, published by FHWA.

**Master Plan:** A long-range plan that defines the community goals for development, including transportation.

**Metropolitan Planning Organization (MPO):** An organization responsible for transportation planning within an urbanized area of more than 50,000 people.

**National Association of City Transportation Officials (NACTO):** A non-profit association that represents large cities in North America on transportation issues

**New Hampshire Department of Transportation (NHDOT):** New Hampshire's state agency for transportation planning, design, and construction.

**Notice to proceed (NTP):** A letter to a contractor stating when the contractor can begin work and the conditions of the contract.

**Operating speed:** The speed at which drivers generally operate vehicles on a particular road.

**Plan view:** A drawing that provides an overview as if looking straight down on the project.

**Preliminary design:** The initial phase of design drawings and supporting documents, which goes beyond simple concepts but does not include all details.

**Profile:** A cut-through view of the road surface parallel to a baseline such as the centerline.

**Project Team:** The people or organizations in charge of a project.

**Public hearing:** A formal meeting required by law to discuss a project during which citizens can provide comments.

**Public meeting:** A meeting in which information about a project is presented to the public.

**Regional Planning Commission (RPC):** An organization in charge of coordinating planning efforts across the towns and cities it comprises.

**Right-of-way (ROW):** Land owned by a jurisdiction that is used for the road, services and adjacent access areas.

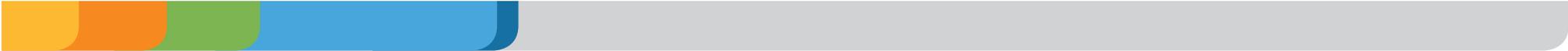
**Road diet:** Reduction in the number of through travel lanes on a roadway, usually to make room for a two-way left-turn and bike lanes.

**Road standards:** Criteria that specify dimensions and materials for roads under the jurisdiction of the governing body.

**Rumble strip:** A road feature that alerts inattentive drivers by causing a tactile vibration and audible rumbling, transmitted through the wheels to the vehicle body.

**Safe Routes to School (SRTS):** A national program that assists states and communities in enabling and encouraging children to safely walk and bicycle to school.





**Shoulder:** The paved or gravel part of the roadway that is adjacent to the vehicular lanes of the road and is on the same level.

**Sidewalk:** The portion of the right-of-way adjacent to the roadway but intended for use by pedestrians, usually made of concrete or asphalt.

**Sight distance:** The length of roadway or shared-use path that is visually unobstructed.

**Site plan regulations:** A set of design requirements for districts and subdivisions within a municipality.

**Speed limit (or posted speed):** The maximum speed allowed by law for vehicles.

**Stakeholders:** The people or organizations that have interest or concern in a project.

**Statewide Transportation Improvement Program (STIP):** A four-year state project listing for federally-funded projects.

**Stop bar (or line):** A wide solid white line indicating the required position behind which to stop vehicles.

**Striping:** Road surface paint lines, which can be solid or dashed, white or yellow.

**Ten Year Plan:** An NHDOT document listing approved transportation projects, their estimated costs, and their specific funding sources.

**Traffic calming:** Set of strategies aimed at slowing down or reducing traffic volume.

**Transportation Advisory Committee (TAC):** A committee composed of representatives from every municipality within the jurisdiction of the Regional Planning Commission or Metropolitan Planning Organization that focuses on transportation issues and projects.

**Transportation Improvement Program (TIP):** A management tool used by Regional Planning Commissions for planning transportation projects in the region.

**Two-way left-turn lane (TWLTL):** A lane between opposing travel directions that can be used by left-turning vehicles traveling in either direction.

**Universal Design:** Facilities and services that accommodate the widest range of potential users.

**Urban compact:** An area set by the commissioner of transportation mainly occupied by homes and businesses where local municipalities have authority and responsibility over all the roads, including state-numbered highways.

**Value engineering:** An evaluation of the cost-effectiveness of a project with recommendations for alternative solutions.



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**Page 5** “On average, people who walk or ride a bicycle to a business spend as much money or more than people who drive motor vehicles, and they visit businesses more frequently than motorists do.” Clifton, Kelly. “Consumer Behavior and Travel Choices: A Focus on Cyclists and Pedestrians.” [http://nacto.org/docs/usdg/consumer\\_behavior\\_and\\_travel\\_choices\\_clifton.pdf](http://nacto.org/docs/usdg/consumer_behavior_and_travel_choices_clifton.pdf)



# ACKNOWLEDGEMENTS

## PHOTO CREDITS:

Key to credit abbreviations:

BPTAC: NHDOT Bicycle and Pedestrian Transportation Advisory Committee

MAST: Monadnock Alliance for Sustainable Transportation

NACTO: National Association of City Transportation Officials

NH SRTS: New Hampshire Safe Routes to School

NHDOT: New Hampshire Department of Transportation

RSG: Resource Systems Group

SABR: Seacoast Area Bicycle Riders

**Cover (left to right):** NH SRTS, SABR, MAST, NH SRTS

**Page 2:** NH SRTS

**Page 4:** SABR

**Page 5 (left to right):** MAST, SABR, NH SRTS

**Page 6:** NH SRTS

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**Page 10:** Bike Manchester

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**Page 19:** Bike Manchester

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