NEW HAMPSHIRE

PEDESTRIAN AND BICYCLE PLAN

Final – August 2023

New Hampshire DOT
Department of Transportation

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

William Cass, P.E.
Commissioner

David Rodrigue, P.E.
Assistant Commissioner

Andre Briere, Colonel, USAF (RET)
Deputy Commissioner

August 23, 2023

Dear Fellow Granite Staters,

I am pleased to present the New Hampshire Statewide Pedestrian & Bicycle Plan. This document is the culmination of several years of engagement, analysis, and discussion by staff and subject matter experts from the New Hampshire Department of Transportation, the Regional Planning Commissions, advocacy organizations, and other stakeholders from across our great state. Over the course of this plan's development, the project team had the opportunity to engage with hundreds of New Hampshire residents, both in person and virtually, whose input was crucial to the development of this plan's recommendations, and whose passion for making walking and biking safer across the state inspired us. We intend to continue this partnership and collaboration in implementing this plan.

This Plan's three main goals of Safety, Access, and Culture define the vision for the next decade of investment in active transportation in New Hampshire as an integral part of New Hampshire's transportation system. The Pedestrian & Bicycle Plan will be used in conjunction with the Strategic Highway Safety Plan to create an environment where the use of any mode of travel, whether motor vehicles, transit, bicycles, or walking, will be safe and convenient for residents of all ages and abilities. Adoption of this Plan also comes at the right time for New Hampshire, with the passage of the 2021 Bipartisan Infrastructure Law providing increased funding for a variety of federal transportation programs. The Bipartisan Infrastructure Law provides formula funding and discretionary grants that will allow the Department and New Hampshire communities to implement many of the recommendations included in this Plan.

New Hampshire's natural beauty and small-town charm make it a great place to walk and bike. Walking and biking also have economic, environmental, and health benefits, which means that investing in active transportation is investing in our state's people. I hope you will read and digest the project and policy recommendations contained in this Plan, which are the concrete steps that NHDOT and its partners across the state will take to make walking and biking a safe and feasible way to travel in our day-to-day lives.

William J. Cass, P.E.
Commissioner

New Hampshire Department of Transportation (NHDOT) thanks New Hampshire residents for their participation during the planning process and for generously providing their input at farmer's markets, public meetings, and via the online maps and survey. NHDOT also extends its gratitude to the following multi-stakeholder committees, which provided invaluable feedback during the planning process:

- NHDOT Complete Streets Advisory Committee Members (CSAC)
- Project Advisory Committee Members (PAC)
- NHDOT Reviewers
- FHWA NH Division Office

In addition, the development of the Statewide Pedestrian and Bicycle Transportation Plan would not have been possible without the support and guidance of staff in each of the following Regional Planning Commissions (RPCs) of New Hampshire:

- Central NH Regional Planning Commission (CNHRPC)
- Lakes Region Planning Commission (LRPC)
- Nashua Regional Planning Commission (NRPC)
- North Country Council Regional Planning Commission (NCC)
- Rockingham Planning Commission (RPC)
- Southern NH Planning Commission (SNHPC)
- Southwest Region Planning Commission (SWRPC)
- Strafford Regional Planning Commission (SRPC)
- Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC)

The Plan was prepared by:

- NHDOT Safety and Active Transportation Staff
- Alta Planning + Design
- Resource Systems Group, Inc.
- Economic Development Research (EDR) Group

Executive Summary

The New Hampshire Pedestrian and Bicycle Plan (Plan) will act as a blueprint for improving safety, access, and culture for pedestrians and bicyclists who use state roadways in New Hampshire. Outlining key actions to be implemented over the next ten years, the plan identifies infrastructure recommendations and promotes changes in planning practice that will help connect people of all ages and abilities to where they want to go through an expanded pedestrian and bicycle network.

Chapter 1: Introduction	• Highlights the importance of a statewide plan and explains how the plan will be used • Connects to the NHDOT Strategic Highway Safety Plan (SHSP) to underscore how both plans prioritize safety for the most vulnerable roadway users • Describes the planning process • Defines a vision for the future of walking and biking supported by three goals: safety, access, and culture • Provides an overview of the key themes from public engagement on opportunities and challenges associated with walking and biking in New Hampshire today

Chapter 2: Existing Conditions	• Defines the context of New Hampshire to underscore the importance of context-sensitive solutions for rural areas
	• Highlights key existing condition trends through review of the following:
	  ○ Mode share and mode shift potential
	  ○ NHDOT maintenance practices
	  ○ Sidewalk and bikeway networks
	  ○ Crash data between 2010 and 2019
	  ○ Connection between active transportation and equity
	  ○ Level of Traffic Stress (prioritizing user comfort)

Chapter 3: Policy & Practice Recommendations	• Identifies policies and general practice recommendations that support active transportation • Collaboration is essential! Key partnerships between stakeholders are prioritized including recommendations for the following agencies: NHDOT, RPCs, Local Governments, Other State and Federal Agencies, Advocates and Nonprofits • Key recommendations to improve pedestrian access and biking are organized into 4 "E's"— Evaluation, Enforcement, Education, and Encouragement • A series of safety recommendations related to the design and operation of the roadway system aim to reduce fatalities and severe injuries
Chapter 4: Complete Streets Approach	• An overview of Complete Streets, including a highlight of the benefits, a summary of core policy elements, and links to statewide Complete Streets policy examples • A recommendation for NHDOT to institutionalize and implement Complete Streets practices and design details
Chapter 5: Desired Pedestrian & Bikeway Networks	• Network recommendations were developed through a review of existing conditions, public input and with the guidance of RPC staff • The desired pedestrian network, while not a comprehensive assessment of sidewalks due to data limitations, recommends over 800 miles of sidewalk • The desired bikeway and trail network recommends over 2,000 centerline miles of bikeways and over 700 miles of trails • 146 unique spot improvements were recommended to improve pedestrian and bicyclists' safety and access • A recommendation to develop a webmap of the desired networks for easy access and to monitor progress over time
Chapter 6: Plan Implementation	• A highlight of the project development process and how projects will move forward is provided • Key maintenance recommendations, such as designing with maintenance in mind, is provided • Performance measures for each of the three plan goals to benchmark the improvement of pedestrian and bicycling

Chapter 6: Implementation (continued)	safety, access, and culture in New Hampshire and help guide future decision making at the statewide level
	• Key action items intended to guide NHDOT towards implementation of the Plan are grouped into short-term (one to three years), mid-term (three to five years) and long-term (five or more years). A sample of actions items include:
	  ○ Identifying performance targets
	  ○ Acquiring new roadway data such as shoulder widths
	  ○ Explore funding source for priority projects

Table of Contents

Appendices

List of Tables

List of Figures

Glossary of Terms

Active Transportation: Travel by self-propelled, mostly human-powered activities such as walking, biking, e-biking, rolling (wheelchair, scooter, or stroller), running, and riding for transportation or recreational purposes.

ACS: The American Community Survey helps local officials, community leaders, and businesses understand the changes taking place in their community through data that is provided every year. It is the premier source for detailed population and housing information that can be used to plan investments and services.

ADA: The Americans with Disabilities Act requires access for people with a wide range of disabilities. Public rights-of-way and facilities are required to be accessible for all users through the above statute regardless of funding source. This applies not just to facility design, but to maintenance practices as well, including snow clearance in winter months. The Public Rights-of-Way Accessibility Guidelines (PROWAG) are deemed best practice and have been adopted by NHDOT.

Chestnut Street bike lane (photo: Bike Manchester website)

All Ages and Abilities: Many existing bicycle facility designs exclude most people who might otherwise ride, traditionally favoring very confident riders, who tend to be adult men. All Ages and Abilities facilities are designed to be safe, comfortable, and equitable, achieving accommodations for all user types.

Shoulder Bicycle Route (pg. 11) along Rt. 103 in Warner (photo: Tim Blagden)

Bike Boulevard: Streets with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority. Bicycle Boulevards use signs, pavement markings, and speed and volume management measures to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets.

Bike Box: A bike box is a designated area at the head of an approach lane to a signalized intersection. Bicyclists are encouraged to position themselves inside of the bike box during the red-light phase in order to be more visible to motorists when proceeding into a shared bike/motor vehicle lane or when taking a left turn onto a side street.

Bicycle Lane: Bicycle lanes designate a priority space for bicycles through the use of pavement striping, pavement markings, and if used, signage. Bike lanes are located adjacent to motor vehicle traffic and travel in the same direction as motor vehicles**.**

Bikeway: A facility intended for bicycle travel that designates space for bicyclists distinct from motor vehicle traffic. Examples of a bikeway: shared-use path or trail, sidepath, separated bike lane, buffered bike lane. A bikeway does not include shared lanes, sidewalks, signed routes, or shared lanes with shared lane markings, but does include bicycle boulevards.

Buffered Bicycle Lane: A bicycle lane separated from adjacent travel lane or parking lane by a pattern of longitudinal markings. Buffered bicycle lanes increase the level of visual and horizontal separation from motor vehicle traffic. The buffer should be at least 3ft.-4ft. wide to protect people riding in the lane from being hit or forced into traffic by drivers opening car doors without looking. 'Dooring' can be a cause of serious injuries and fatalities for bicyclists.

Complete Streets: Roadways that are designed and operated to prioritize safety, comfort, and access to destinations for all road users, including motorists, pedestrians, bicyclists, and transit users. Complete Streets are designed to be context-sensitive, to strengthen placemaking, and implemented by a phased process. Complete Streets is a type of planning process, rather than a specific outcome, and will look different in different contexts.

Context-Sensitive Solutions: According to AASHTO, an approach to "advancing transportation programs and projects in a collaborative manner and in a way that fits into the community and environment." While CSS emphasizes collaboration and public input, unlike Complete Streets, it does not specify that the needs of non-motorized roadway users be considered. This means that a Context-Sensitive Solutions process may produce a design that worsens conditions for biking and walking, if the planning and design are focused on other priorities, such as a need for parking.

Contra-flow Bike Lane: Designed to allow bicyclists to ride in the opposite direction of motor vehicle traffic. A one-way traffic street is converted into a two-way street: one direction for motor vehicles and bikes, and the other for bikes only. Contra-flow lanes are separated with yellow center lane striping.

Critical Stakeholders: Typically, state, regional, and local agencies expected to take the lead in monitoring data points to meet the recommended Performance Measures for each goal. In some cases, non-profits may be included as a responsible party.

E-Bike: Defined by State of New Hampshire law as "a pedaled vehicle equipped with an electric motor of less than 750 watts that falls within one [of 3 classes]." Class I have motors that provide assistance only when the rider is pedaling, up to 20 mph; class III also require the rider to pedal, up to 28 mph. Class II e-bikes have motors that do not require the rider to pedal, and can reach speeds of 20 mph.

Goals: General statements of what the stakeholders and residents who live, work or visit New Hampshire hope to achieve over time.

The Green Book: formally the AASHTO Policy on Geometric Design of Highways and Streets. The AASHTO Green Book is a publication adopted by FHWA as the design standard for roadways on the NHS. The latest edition of the "Green Book" (2018) presents an updated framework for geometric design that is more flexible, multimodal, and performance-based than in the past—providing guidance to engineers and designers who strive to make unique design solutions that meet the needs of all highway and street users on a project-by-project basis.

Level of Traffic Stress (LTS): a measure of the suitability of a given stretch of roadway for bicycling, recognizing that people have differing levels of tolerance for riding a bicycle next to vehicular traffic. LTS ranges from 1 to 4 (lowest to highest stress).

Marked Shared-Lane: Marked shared-lane roadways are designated with shared-lane markings in the roadway, sometimes called 'sharrows'. Shared-lane markings are intended to reinforce the legitimacy of bicycle traffic on the street. The 2009 edition of the Manual on Uniform Traffic Control Devices

(MUTCD) notes that “shared-lane markings should not be placed on roadways with a speed limit above 35 mph.”

Pedestrian: Includes people walking, using a wheelchair or mobility-assist device, running, and jogging. Almost everyone is a pedestrian at some point of a trip whether they are driving a motor vehicle, using public transit, or biking.

Rail Trail: A rail trail is a trail that has been established on a rail corridor, either active or inactive, that is managed for year-round use. Most rail corridors are owned by either the NHDOT or the NH Department of Natural and Cultural Resources (NHDNCR), but some are also owned by towns/municipalities or private entities, with most of the surface maintenance responsibility falling to NHDNCR. Furthermore, most rail trails remain snow covered for winter recreation. As such, rail trails should be considered ancillary to pedestrian and bicycle transportation facilities.

Separated Bicycle Lane: Separated bicycle lanes are physically separated from motor vehicle traffic with a vertical element. Separated bicycle lanes can be at street or sidewalk-level; a parking lane, roadway striping with flexible delineator posts, or other barrier types may provide the vertical separation from motor vehicle traffic.

Shared-Use Path: A shared-use path is an improved multi-use trail that runs within its own right-of-way, or is physically separated from motorized vehicular traffic by a buffer or barrier.

Shoulder Bicycle Route: Shoulder bicycle routes are paved areas adjacent to rural roadway travel lanes, delineated by a white edge marking. When providing a paved shoulder for bicycle use, a minimum shoulder width of 4 ft. is recommended with no vertical obstruction to the right, or 5 ft. from the face of a curb or guardrail.

Sidepath: A sidepath is a shared-use path or trail that runs parallel with and immediately adjacent to roadways, frequently within the roadway’s right-of-way. They are typically separated from the edge of the roadway.

Sidewalk: A sidewalk is a path along the side of a road. Usually constructed of concrete or asphalt, it is designed for pedestrians, and is normally separated from the vehicular section by a curb.

Spot Improvements: Improvements at specific locations along bicycle and pedestrian facilities that improve the safety and comfort of points that are difficult to cross, or uncomfortable to use. Spot improvements include traffic calming and safety improvements, intersection and crossing improvements, as well as pedestrian and bicycle bridges or underpasses.

State Roadways: Roadways owned and maintained by the New Hampshire Department of Transportation, both numbered and unnumbered.

Strategic Highway Safety Plan (SHSP): Fourth update to New Hampshire’s Strategic Highway Safety Plan, published August 2022. The SHSP evaluates recent crash trends, identifies priorities, and establishes goals and strategies to reduce fatalities and serious injuries for all users of New Hampshire’s highways as part of the Vision Zero, or Driving Toward Zero, framework.

Trail: A trail is a travel way established either through construction or use is and is passable by numerous means but in the context of this plan, by foot and/or by bicycle.

Underserved Communities: Communities that can include neighborhoods and groups of people of a particular race, ethnicity, language, age, gender, disability, or national origin often with low-income and typically more dependent on transit, bicycling, and walking than the New Hampshire average.

Vulnerable Roadway User: Users who are most at risk in traffic because they are not protected by an outside shield or protective device that would absorb energy in a collision (such as a motor vehicle). Non-motorized vulnerable roadway users include pedestrians and bicyclists. Motorized vulnerable roadway users include motorcycles.

Acronyms

AASHTO – American Association of State Highway and Transportation Officials

BIL – Bipartisan Infrastructure Law, also known as IIJA (Infrastructure Investment and Jobs Act)

CMAQ – Congestion Mitigation and Air Quality Improvement

CSAC – Complete Streets Advisory Committee

FHWA – Federal Highway Administration

HSIP – Highway Safety Improvement Program

LAB – League of American Bicyclists

LTS – Level of Traffic Stress

MPO – Metropolitan Planning Organization

NHS – National Highway System

NHDOT – New Hampshire Department of Transportation

OHRV – Off-Highway Recreational Vehicle

PAC – Project Advisory Committee

RPC – Regional Planning Commission

TAP – Transportation Alternatives Program

Chapter 1: Introduction

This chapter introduces the purpose of this Plan and why the Plan is important to active transportation planning efforts in the state.

In this Chapter:

- **Why a Statewide Pedestrian and Bicycle Plan?**
- **Pedestrian and Bicycle Plan Process**
- **Connection to 2022 – 2026 Strategic Highway Safety Plan**
- **Vision and Goals**
- **Benefits of Active Transportation**
- **Summary of Public Engagement**

Silver Street in Dover, NH

Why a Statewide Pedestrian and Bicycle Plan?

The New Hampshire Pedestrian and Bicycle Plan (Plan) serves as a roadmap for the future of active transportation on and across state roadways in New Hampshire. Over the course of the Plan's envisioned 10-year lifespan, it will be used to help guide infrastructure recommendations and promote changes in planning practice that will help connect people to where they want to go, whether they use active transportation for the whole trip or just a part of it, such as the walk to a bus stop or a bike ride to school. Specifically, the Plan includes recommendations to implement pedestrian and bicycle network improvements as well as policies and programs for NHDOT to enact to support and bolster safe pedestrian and bicycle travel in the state.

How will the Plan be Used?

- **To provide an analysis of existing conditions and develop network recommendations,** primarily for state roadways, that will offer non-motorized users more connectivity and access. In some cases, adjacent lower-stress municipal roads or a segment of a rail trail will be part of the preferred bicycle network.
- **To provide an inventory of existing Level of Stress conditions** around the State for bicycle transportation safety and access.
- **To provide a summary and recommended changes or revisions of the current policies and practices** in New Hampshire that impact safety and access for all people using active transportation, public input data on transportation priorities, and opportunities for improvement.
- **To inform planning, scoping, design, construction, and maintenance phases** of NHDOT projects, and equip NHDOT staff and consultants to implement improvements where appropriate.
- **To provide direction to Regional Planning Commissions** and municipalities in developing specific pedestrian and bicycle safety and access solutions for local and state roadways.
- **To identify potential projects** for Regional Planning Commissions to incorporate into the Ten-Year plan, as well as for HSIP, TAP, CMAQ, and discretionary grant programs.
- **To direct future planning efforts, programs, policies, and transportation project development**, and guides NHDOT, planners, engineers, and policy makers, etc. in the development of active transportation practice and safer active transportation mobility throughout the state.
- **To satisfy federal requirements** for each state transportation agency to adopt and periodically update its overall long-range transportation plan that includes pedestrian and bicycle transportation. The expansion of the Complete Streets approach will also help to align New Hampshire with the FHWA focus on Complete Streets and safe systems as called out in the BIL (Bipartisan Infrastructure Law) and the March 2022 FHWA Report to Congress.

Pedestrian & Bicycle Plan Process

The NH Pedestrian and Bicycle Plan planning process included robust public engagement using a variety of formats (listening sessions, a project website, social media outreach, surveys, and public presentations that have engaged 2,000 stakeholders). The recommendations within this Plan were developed by analyzing the existing conditions and collecting feedback from public and stakeholder engagement (*Figure 1*). The vision, goals, and objectives laid out in this Plan were formulated as a result of the engagement process and stakeholder input, and will operate in conjunction with those of the Strategic Highway Safety Plan[1] and the newly published NH Rail Trails Plan.[2] This Plan sets a direction for NHDOT, municipalities and planning commissions to implement projects and improve program delivery to ensure users of all ages and abilities have access to a safe network of sidewalks, bikeways, and trails across New Hampshire.

Additional details on the public engagement efforts involved in this planning process can be found on pages 20-21 as well as in Appendix 1.

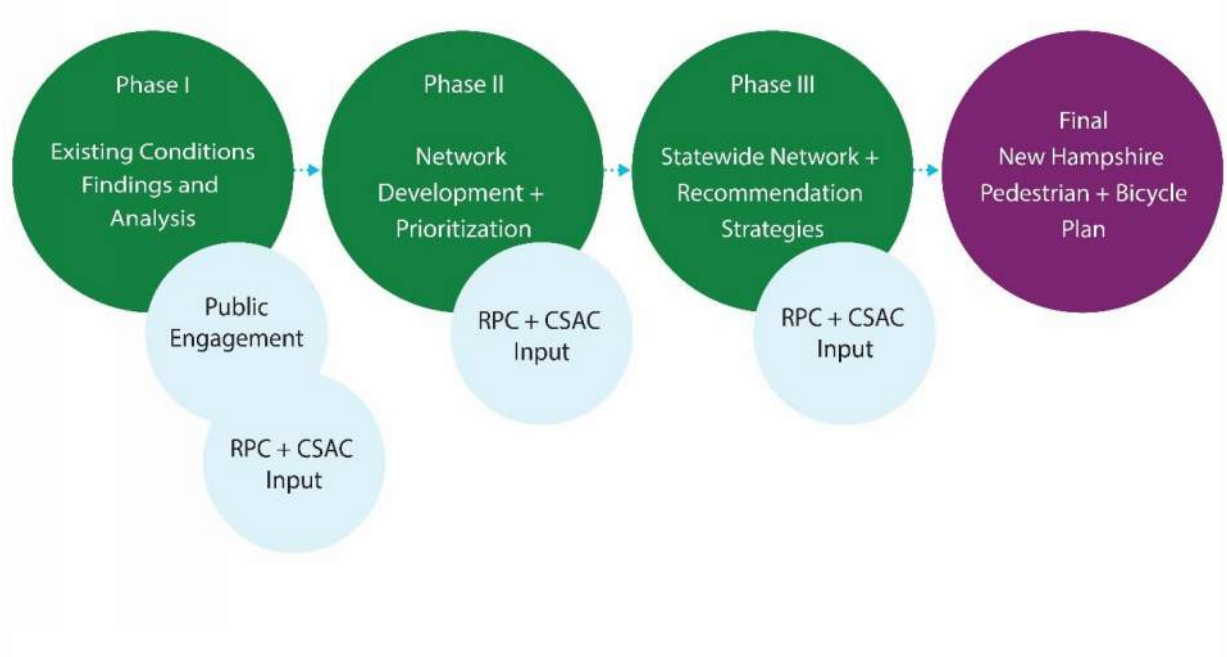


Figure 1. Project Phases. In this figure, "CSAC" = CSAC + PAC + NHDOT + FHWA Reviewers"

NHDOT Complete Streets Advisory Committee and Project Advisory Committee

To help guide the NH Pedestrian and Bicycle Plan effort, a Project Advisory Committee (PAC), which included the Complete Streets Advisory Committee (CSAC) and additional stakeholders, was organized by NHDOT to provide a more complete perspective on pedestrian and bicycling issues. CSAC/PAC provided critical feedback into the development of the Plan and its recommendations. The purpose of CSAC is to advise NHDOT on policies, programs, and recommendations to support active transportation and transit as safe, convenient, and economically and environmentally beneficial forms of transportation and recreation in New Hampshire.

Regional Planning Commissions

The Regional Planning Commissions (RPCs) were engaged throughout the process and played a key role during the development of the desired networks and prioritization of the recommendations of network improvements. These nine New Hampshire RPCs are:

- Central NH Regional Planning Commission (CNHRPC)
- Lakes Region Planning Commission (LRPC)
- Nashua Regional Planning Commission (NRPC)
- North Country Council Regional Planning Commission (NCC)
- Rockingham Planning Commission (RPC)
- Southern NH Planning Commission (SNHPC)
- Southwest Region Planning Commission (SWRPC)
- Strafford Regional Planning Commission (SRPC)
- Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC)

Connection to 2022 - 2026 NH Strategic Highway Safety Plan

The NHDOT Strategic Highway Safety Plan (SHSP) is part of the NHDOT's Highway Safety Improvement Program that outlines the state's approach to making roads safer for all users. The goal is to reduce the number of fatalities and serious injuries by 50% by 2035, ultimately working toward zero fatalities and serious injuries by 2050. Many stakeholders were involved in analyzing crash data and the top crash types in order to select Critical Emphasis Areas that will be a priority of the State's activities in the next five years. These prioritized areas include Older Drivers, Speed and Aggressive Driving, Non-Motorized Vulnerable Users, and Vehicle Occupant Protection. Each of these identified priorities help to inform a number of strategies and actions that are outlined throughout the SHSP.

The Critical Emphasis Area dedicated to non-motorized Vulnerable Users focuses on a specific type of roadway user that utilizes the shared space for active transportation. Within this emphasis area, vulnerable users are defined as pedestrians, wheelchair users, bicyclists, and e-bike users. In order to provide safe access to roadways for non-motorized users, the SHSP outlines specific strategies and actions to create safe infrastructure for these users and educate other types of roadway users. The goals for the Non-Motorized Vulnerable User Action Plan include a reduction in motor vehicle crashes involving these vulnerable roadway users and creating safe infrastructure that encourages the use of active transportation options.

The NH Pedestrian and Bicycle Plan works to achieve the same goal as the SHSP. Both plans aim to reduce the number of fatalities and serious injuries by accounting for vulnerable users of New Hampshire roadways, such as those choosing to use active transportation options.

The 2022-2026 SHSP identified the following statistics and recommendations relevant to the NH Pedestrian and Bicycle Plan:

- Pedestrians accounted for 9% of total roadway fatalities between 2015-2019
- Bicyclists accounted for 2% of total roadway fatalities between 2015-2019
- In New Hampshire, 20% of pedestrian roadway fatalities and 55% of bicyclist roadway fatalities are at intersections.
- Strategies and supporting actions:
    - Institutionalize and implement Complete Streets practices, and encourage municipalities to develop and implement their own Complete Streets policies.
    - Expand consideration of vulnerable roadway users in infrastructure design and funding.
    - Continue to encourage laws like NH's 3-foot law, to help protect vulnerable road users.
    - Create and disseminate educational materials to promote awareness of vulnerable users.
    - Increase pedestrian and bicycle safety-focused coordination among state, regional, and local agencies on data collection, data sharing, and enforcement.
    - Investigate funding opportunities for maintenance of pedestrian and bicycle safety infrastructure projects.
    - Create age-appropriate safety curriculum (pre-drivers ed), which would include vehicular passenger, pedestrian, and bicycle safety for middle and high-school students.
    - Work with State Police and local law enforcement to develop and implement in-service training for officers on bicycle and pedestrian laws and enforcement techniques.
    - Implement countermeasures that reduce the frequency and severity of intersection crashes.

Vision and Goals

The NH Pedestrian and Bicycle Plan's vision and goals were established to guide the planning process and to direct the Plan's implementation. The vision and goals were developed through input from the CSAC, PAC and other stakeholders from around the state. The **vision** is a broad statement, both inspirational and aspirational, that declares the desired future state of active transportation in New Hampshire. The **goals** represent specific target areas to accomplish the vision. **Performance measures,** which are discussed in greater detail in Chapter 6, *Implementation*, are provided to monitor progress towards achieving the Plan's goals and to ensure an evaluation mechanism is in place.

Vision Statement

The State of New Hampshire will **enhance safety and mobility through improved pedestrian and bicycle-related policies** that continually expand and enhance our network of pedestrian, bicycle, and transportation facilities designed **for a wide variety of users and abilities.**

These enhancements provide practical and accessible transportation choices, improved safety conditions, and they encourage and promote new business and tourism opportunities all of which **enhance the quality of life for residents and visitors throughout the Granite State.**

Goals

Focusing on the three goals described below will help New Hampshire achieve the vision. Part of the plan implementation process will involve the collection of data to establish baselines for each of the chosen performance measures.

GOAL 1 – SAFETY

Objective 1.1: Reduce the number of crashes involving pedestrians and bicyclists that result in fatal or serious injury.

Objective 1.2: Increase pedestrian and bicycle safety with policies, programs, and pedestrian and cycling facilities that are suitable for their contexts.

Performance Measures: Reduce crashes involving pedestrians and bicyclists that result in fatal or serious injuries, and improve the state's capability to measure the rate of non-motorized fatalities and serious injuries through more reliable crash and injury data collection and a non-motorized volume collection program**.**

GOAL 2 – ACCESS:

Objective 2.1: Address gaps in the bicycle and pedestrian networks to connect people to key destinations, regions, and communities.

Objective 2.2: Ensure Granite Staters have access to low-stress bicycle and pedestrian facilities.

Performance Measures: Gather and develop data to improve the accuracy of LTS analysis on state and then local roads in New Hampshire, including reliable data on shoulder width, traffic speed and traffic volume through routine road inventory, cell phone or other data sources, and increase the percentage of the NHDOT network that has an LTS score of 1 or 2 from 19% in 2020 to 25% by 2035.

GOAL 3 – CULTURE:

Objective 3.1: Create a "culture of safety" by prioritizing the needs of all users in roadway planning, design, and maintenance, as well as all public-facing NHDOT communications.

Objective 3.2: Expand Complete Streets principles into everyday practice through practice changes at the state level.

Performance Measures: Formalize the Department's Complete Streets approach and design guidelines at the state and RPC level; conduct training (Complete Streets and designing for pedestrians and bicyclists) for DOT staff; implement driver's education curriculum changes and safety campaigns aimed at drivers, pedestrians, and bicyclists; and increase number of Bicycle and Walk Friendly Community awards.

Benefits of Active Transportation

Active transportation has many benefits to residents and communities. It increases mobility, improves safety, enhances economic development, increases equity, decreases environmental hazards, improves health, and creates opportunities.

Increased Mobility

- Pedestrian and bicycle accessibility helps to promote mobility options for those who do not have access to a car due to age (children and seniors), economic status, disability, lack of driver's license, or temporary impairment, and for those who do not wish to use a car.
- Per the 2009 FHWA National Household Travel Survey,[3] 40% of motor vehicle trips in the U.S. are under two miles in length and many travelers would access destinations by bicycle or on foot if comfortable facilities were provided, minimizing the need for potential road-capacity expansion.

Safety

- Improved pedestrian and bicycle facilities have led to increased number of people walking and biking, and decreased number of crashes, injuries, and fatalities.[4]
- Roads with appropriate pedestrian facilities[5] can reduce crashes involving pedestrians by up to 50 percent.[6]

Economic Development

- International studies from Germany and the Netherlands have found that bicyclists spent less per visit to a business but visited the business more frequently (than those arriving by car), which results in higher spending patterns over time. Similar studies in the US, some of which compare all modes of transportation, are trending to similar results. [7] Refer to the New Hampshire State Rail Trails Plan for a detailed evaluation of the economic benefits of rail trails.
- Fuel is a major cost for many New Hampshire households, and increasing active transportation opportunities allows families to reduce the amount they spend on gas.

Public Health & Environmental Sustainability

- Improving conditions for pedestrians and bicyclists encourages exercise and helps improve both physical and mental well-being.
- Encouraging the use of active transportation leads to a reduction in emissions and an improvement in air quality that benefits both humans and the climate.

Summary of Public Engagement

The planning process traveled to and brought together stakeholders from across New Hampshire to develop this plan. Collaboration was the foundation to develop this Plan's desired network and recommendations, and will be essential to the implementation of the Plan. The NHDOT CSAC, PAC and RPCs guided the process. Input about opportunities and challenges associated with active transportation in New Hampshire was solicited via multiple methods. Stakeholder meetings and public outreach were conducted across the state, and residents could also access a robust project website that included maps to annotate and surveys to answer, as well as opportunities to provide custom suggestions for network improvements. More detail on the public engagement activities executed for the document can be found in Appendix 1.

A summary of engagement activities include:

- Regular meetings with CSAC and PAC
- One meeting with each of the nine RPC Technical Advisory Committees
- A project web site, with online interactive map and survey
- A series of public meetings and outreach events throughout the state

The number of public responses and event attendees have included:

- 859 suggestions made to the online interactive map[8]
- Online survey responses from 1095 individuals
- Responses from 620 unique farmer's market visitors
- 150 attendees at conventional public meetings combining presentation as well as interactive workshop format in smaller groups
- 172 people provided their name and/or comments on the project web site portal
- Total of at least 2037 individuals who attended events or made comments (not including the few hundred people who left the 859 suggestions on the online interactive map)

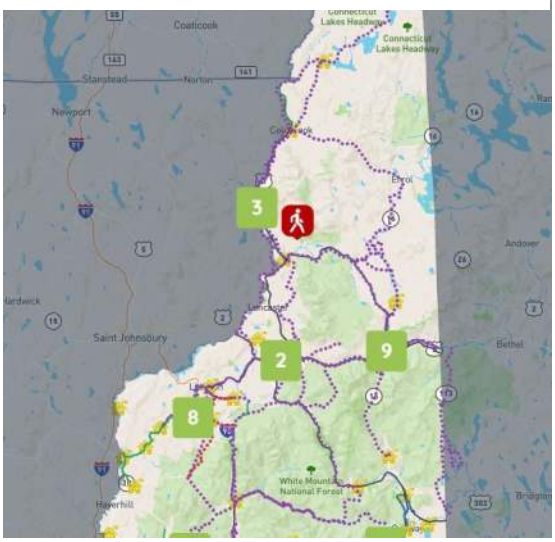
Farmer's markets proved to be a successful venue for outreach events (photo from Dover, NH)

Summary of Key Feedback

Based on the variety of engagement formats and activities initiated for this planning effort, valuable input was gathered about pedestrian and bicycling in New Hampshire. The bullets below provide an overview of the key public feedback received. More details are available in Appendix 1.

- People throughout the state are concerned about safety when using active transportation, based primarily on the volume of traffic, speeds, driver distraction, and lack of safe facilities. For many, this discourages them from using any transportation mode other than driving.
- Survey respondents stated they would like to see more trails, paths, and marked bicycle lanes in the state in order to try bicycling for recreation or transportation.
- There were mixed feelings expressed about the need to improve conditions for pedestrians and bicyclists on busy state roadways, versus looking at nearby roadways with lower traffic volume and speed to accommodate active transportation modes. There may be limited benefit in adding bicycle facilities to long stretches of state roadway between rural communities unless they have been specifically identified as priorities; however, state roadways often serve as primary roads through populated areas and need to be designed to accommodate all users.
- Many people expressed interest in shorter, more-local bike loops of 5 to 20 miles with improved connections to destinations as a way to provide local recreational opportunities.
- Improved bicycle connectivity, enhancements for pedestrians, especially at road crossings, and new trails are seen as a way to enhance the local economy.
- There was broad support for the state's expanded trail network, despite concerns in some parts of the state about regulating off-highway recreational vehicle (OHRV) usage.
- Many people see expansion of New Hampshire's trail network as a way to encourage more tourism and economic development throughout the year (warmer-weather months for active transportation, equestrians, and skiing and/or snowmobiles in winter).

Large crowds at the project information table (at center) at the Nashua Farmer's Market



Online public input allowed users to share a variety of desirable pedestrian and bicycle routes.

Chapter 2: Existing Conditions

This chapter examines the existing conditions for active transportation in New Hampshire through the state's different contexts and built environment.

In this Chapter:

- **New Hampshire Context**
- **Existing Pedestrian and Bicycle Facilities**
- **Safety Analysis**
- **Understanding Equity**
- **Level of Traffic Stress Analysis**

Main Street in Concord, NH

New Hampshire Context

Geography

Lebanon Street/NH 120 in Hanover is a multimodal corridor with provisions for active transportation.

Although much of New Hampshire is rural, made up of forests and farms, the majority of the area where people live is not. Approximately 63 percent (3 in 5) residents live in a census-designated metropolitan area, and New Hampshire's urban areas, town centers, and main streets can be quite conducive to active transportation. Several cities and towns are compact, and with improved pedestrian and bicycle facilities and programs, offer the opportunity to replace many short automobile trips with people walking, biking, or using other mobility devices. Much of the state's landscape is scenic and provides ample opportunity for active transportation and recreational experiences.

See the following pages for a more in-depth discussion of the current state of active transportation in New Hampshire.

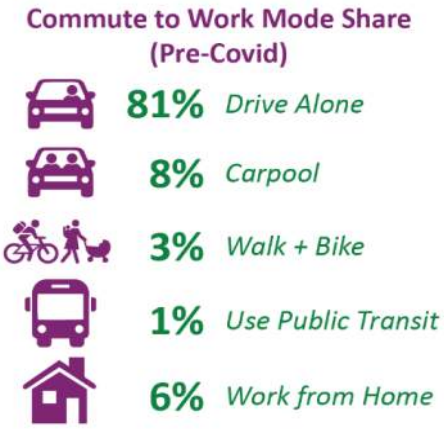
Rural Connectivity: Opportunities and Challenges

New Hampshire's rural areas provide some unique opportunities and challenges for improving pedestrian and bicycle connectivity. Like many places in rural America, main roadways in rural New Hampshire are often state- or municipally-owned and were primarily designed to allow for fast-moving motor vehicle traffic. According to the FHWA's Small Town and Rural Multimodal Networks Guide, common transportation issues in rural areas include long trip distances (often to access key destinations such as grocery stores or medical care), health disparities due to higher rates of physical inactivity, higher crash rates (including higher rates of fatal crashes), and lower incomes than urban areas.[9]

However, there are also opportunities, not least of which is the potential space available for off-road alignments for active transportation corridors. Such off-road alignments, however, are dependent upon public will to acquire the necessary right-of-way. Where the state already owns the right-of-way, the New Hampshire 2022 State Rail Trails Plan can provide a key step forward in improving statewide connectivity while providing yet another practical and enjoyable outdoor recreation resource for visitors and residents. The prevalence of state-owned roadways also makes it relatively straightforward for the NHDOT to implement minor or spot pedestrian and bicycle improvements at the time of repaving. Bicycle and pedestrian network improvements identified by the Regional Planning Commissions should be considered mitigation by private development projects as part of the Department's driveway permit approval process.

Vehicle Availability and Commuting

In New Hampshire, 98.1 percent of workers live in households with at least one automobile, with 81.9 percent living in households with at least two automobiles, and 36.5 percent living in households with three or more vehicles. Pre-pandemic, approximately 80.9 percent of New Hampshire residents commute to work by driving alone with 8.0 percent carpooling, 0.9 percent using public transportation, and 6.1 percent working from home. According to the American Community Survey (ACS), approximately 3.0 percent of people commuted to work by walking or biking.



Source: ACS 5-year data (2012-2016)

Potential Commuting Mode Shift

The estimated mean one-way travel time to work in New Hampshire, taking all modes into account, is roughly 29.4 minutes. However, 14.3 percent of New Hampshire workers live less than 10 minutes from work, and 27.8 percent live less than 15 minutes from work. Many of these commutes to work could potentially be taken by bike, if biking was seen as a safe option, the connectivity of the bike network was improved, and other obstacles such as a lack of safe bike parking at destinations were resolved. The increase in use of e-bikes also has significant potential for making bicycling easier and increasing the numbers of Granite Staters who commute and get around by bike.

The State of Active Transportation in New Hampshire

Some of the most bikeable places in New Hampshire are relatively compact and feature local policies that promote bicycling through new infrastructure and programs as well as rail trails. As of 2023, Concord, Hanover, Keene, Lebanon, Portsmouth, and the Tri-Town area of Bethlehem, Franconia, and Littleton have been designated Bicycle Friendly Communities by The League of American Bicyclists (LAB) as part of their "Bicycle Friendly America" program. In addition, two colleges in the state—Dartmouth and Keene State—are currently designated as Bicycle Friendly Universities by the LAB. In addition, Portsmouth has been recognized by Walk Friendly Communities as a Silver-level Walk Friendly Community, the smallest city nationwide to achieve this designation.

However, in 2022, New Hampshire ranked #36 out of 50 states according to the League of American Bicyclists' Bicycle Friendly State Report Card,[10] receiving an F+ for the Infrastructure and Funding category. In comparison, Vermont ranked #23 and Maine ranked #26—both have adopted statewide bicycle/active transportation plans and Complete Streets policies, and Vermont ranked #1 nationwide for the amount of FHWA spending it allocates to active transportation. The table below compares New Hampshire's LAB, Safe Routes to School, and Walk Friendly Communities scores as of 2023 to its two neighboring states, Vermont and Maine. Copies of the LAB and Safe Routes to School Report Cards, as well as a link to each organization's scoring method, can be found in Appendix 4.

Table 1. State of Active Transportation in Maine, Vermont, and New Hampshire

Scores by State	Bicycle Friendly State Report Card (Rank out of 50)	Safe Routes Partnership Report Card (0-200 points)	Number of Walk-Friendly Communities
Maine	26	114	0
Vermont	23	94	1 Silver, 1 Bronze
New Hampshire	36	23	1 Silver (Portsmouth)

In the rural parts of the state, the state and local roadways often provide the only route option for active transportation but have an inconsistent mix of shoulder widths and/or traffic speeds and volumes.

Some major steps that New Hampshire can take to make bicycling safer and more accessible include promoting this Plan, as well as expanding the Department's Complete Streets approach (see Chapter 4) and pursuing educational opportunities. Maine and Vermont both have a Vulnerable Road User Law in place, which provides for specific penalties for actions towards vulnerable road users (such as pedestrians, bicyclists, and highway workers) or when violations of traffic law lead to the serious injury or death of a vulnerable road user.[11] These laws recognize that the type of simple negligence or traffic violations that may result in minor collisions between cars can have disproportionately severe results when a vulnerable road user is involved.

Education is critical for all users of the transportation network. While pedestrians and bicyclists need to have an understanding and respect for the rules of the road to safely and efficiently navigate the transportation network, automobile operators, whose behavior is a larger driver of pedestrian and bicyclist deaths, need to understand the consequences of excessive speed, the necessary space to provide vulnerable users, and best practices for defensive driving. For example, driver education on the Dutch Reach—a practice for drivers and passengers where, rather than using their hand closest to the door to open it, they use their far hand forcing them to pivot and face oncoming traffic,—is one way to improve safety, particularly for vulnerable roadway users.

Maintenance Roles & Responsibilities

Active transportation facilities require maintenance just as highway and roadway facilities do. To provide equitable transportation for all users, bicycle and pedestrian facilities must be maintained to ensure safe and dependable access. Preventative maintenance on sidewalks and bike lanes can often be incorporated into routine roadway maintenance and can reduce hazards for users and the life cycle cost of facilities. Furthermore, continual upkeep of active transportation facilities can encourage mode shift by providing reliable, safe, and comfortable bicycle and pedestrian transportation options.

The NHDOT maintenance districts are responsible for plowing (most) of the state roads within the state. Although some of the state-maintained roads have sidewalks on the portions that pass-through towns, most of the roadway lengths do not. Consequently, NHDOT does not have a fleet of sidewalk snow removal equipment. Furthermore, it would be impractical to do so since it would likely involve plowing a short stretch of sidewalk in one town, packing up (trailering) the equipment, and moving onto another town to do the same. Since cities and (most) towns already have the equipment to remove snow from sidewalks, it is just more efficient for the sidewalk maintenance responsibility to remain at the local level. City and town officials, recognizing their responsibility to maintain the sidewalks, sometimes shy away from adding sidewalks due to budget constraints and the lack of public will to increase spending.

The table below is a partial list of maintenance responsibilities for pedestrian and bicycle infrastructure in New Hampshire along state-owned roadways and trails. There may be special cases not noted. In most cases in which the municipality is responsible for maintenance, a maintenance agreement must be signed by the municipality since the pedestrian or bicycle facility is in the state right-of-way.

Table 2. Maintenance Responsibilities on State-Owned Roadways and Trails

Maintenance Activity	NHDOT Responsibility	Municipality Responsibility
Snow Removal: Shoulders	X	
Snow Removal: Sidewalks		X
Midblock Crosswalks: Pedestrian signs	X	
Midblock Crosswalks: Pavement markings, RRFB, PHB, Overhead lighting		X
Traffic Signals: Pedestrian signals, Crosswalks, Yield to Pedestrians signs	X	
Bike Lane symbols or Sharrow markings		X
Move Over Bicycle signs		X
Speed Feedback signs		X
Rail Trail and Shared Use Paths: On Trail Maintenance		X (or Trail Group)
Rail Trail and Shared Use Paths: Trail - Road Crossing	Undefined	
Shared Use Paths adjacent to state highways	X	

Existing Pedestrian Facilities

Except for where specifically prohibited by regulation, which in New Hampshire is interstate highways and turnpikes, pedestrians may travel along all public roads, even though sidewalk segments can only be found along some of state-owned roadways. Where sidewalks do not exist, pedestrians may travel along roadway shoulders.

In discrete locations, curb ramps, crosswalks, median refuge islands, traffic signals and traffic-calming measures such as bump outs (i.e., curb extensions) can be found supplementing sidewalks. Combined, these facilities form a localized network within municipal boundaries and regions. The state's pedestrian network also includes a limited number of trails and rail trails where pedestrians travel for both recreation and transportation.

A crosswalk with a Rectangular Rapid Flashing Beacon (RRFB) in Windham, NH (photo: Rebecca Harris)

The table below shows an inventory of existing sidewalks along state-owned roadways and numbered roadways within Urban Compact Areas. Any paved facility constructed within the roadway right-of-way specifically for pedestrian use was counted as a sidewalk during this inventory. These sidewalks vary in width, condition, material (concrete or asphalt), and ADA compliance. Some are adjacent to curbs; others are separated from the adjacent roadway with a grassy offset or landscaped buffer.

Table 3. Existing Sidewalk Length by RPC

RPC	Existing Sidewalk (Miles)
Central New Hampshire	45
Lakes	47
Nashua	67
North Country Council	61
Rockingham	49
Southern New Hampshire	113
Southwest New Hampshire	30
Strafford	43
Upper Valley Lake Sunapee	35
Total Statewide	**490**

Data represents roadways owned and maintained by NHDOT and numbered roadways within Urban Compact Area.

Existing Bikeway Facilities

The state's bikeway facilities include all public roadways, except where bicycles are specifically prohibited by regulation, such as interstates and some other limited-access roadways. While there are no marked bicycle lanes maintained by NHDOT, some communities have implemented bikeway improvements on state-owned roadways and are responsible for the maintenance. These improvements include shared lane markings—also known as "sharrows"—as well as designated bicycle lanes with bike lane pavement marking symbols. Many of the state's trails offer a comfortable, low traffic stress bicycling environment for nearly all ages and abilities.

There are approximately 424 miles of trails—both paved and unpaved—in New Hampshire, primarily built on abandoned rail corridors, with several paths built within or adjacent to road rights-of-way, similar to sidewalks.

Table 4. Existing Bicycle Facilities in New Hampshire by Road Centerline Miles

RPC	Trails	Painted Bicycle Lanes and Shared Lane Marking	State Roads with Paved Shoulders*
Central New Hampshire	23	6	434
Lakes	87	0	633
Nashua	30	0.5	164
North Country Council	86	6	1100
Rockingham	49	3	376
Southern New Hampshire	60	0.5	360
Southwest New Hampshire	21	3	503
Strafford	22	7	284
Upper Valley Lake Sunapee	46	6	481
Total Statewide	**424**	**32**	**4,335**

Data represents roadways owned and maintained by NHDOT.

** Width varies-- includes shoulders too narrow for bicycling or walking.*

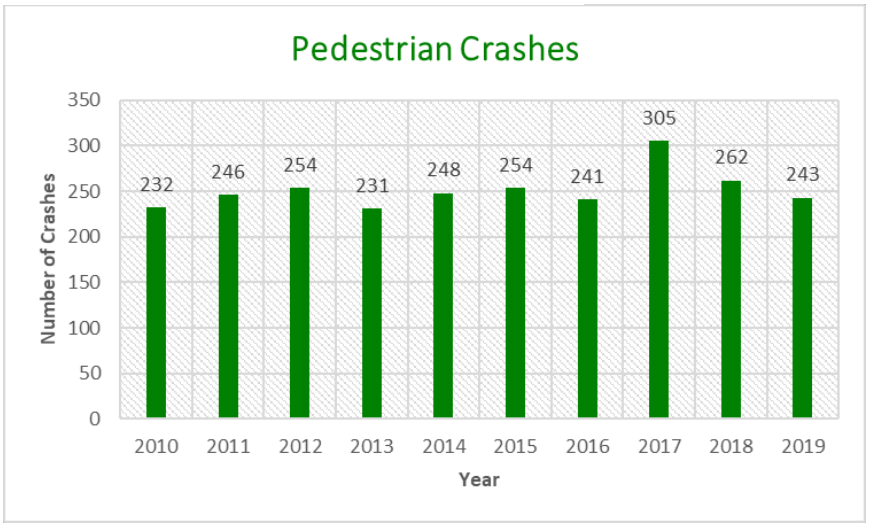
Safety Analysis

There were 1,673 reported bicyclist-motor vehicle crashes in New Hampshire between 2010 and 2019. This included 10 crashes that resulted in fatalities and 100 crashes that resulted in serious injuries. The total number of pedestrian and bicycle crashes is likely higher than the number shown from crash report data, as many go unreported. This is especially true if there were no major injuries or no property damage occurred, or if parties were not aware of the need to report the crash. It is important to consider that reported crashes are just one piece of data for understanding and evaluating safety. Other factors affecting safety include speed, driver distraction, visibility, traffic control devices, and facility separation.

Figure 2. Bicyclist-involved Crashes by Year

There were 2,516 reported pedestrian-motor vehicle crashes in New Hampshire between 2010 and 2019. This included 64 crashes that resulted in fatalities and 248 crashes that resulted in serious injuries.

Figure 3. Pedestrian-involved Crashes by Year



The following figure highlights crash trends by roadway type. Arterial roadways, which have higher posted speeds, more lanes, heavier traffic volumes, and are wider, had the highest percentage of pedestrian and bicycle crashes, despite making up only 11 percent of the entire roadway network. Conversely, local roads (also known as neighborhood streets, as in the figure below) and collectors, which make up larger portions (77 percent and 12 percent respectively) of the roadway network in New Hampshire due to the state's rural character, had lower reported non-motorized crashes.

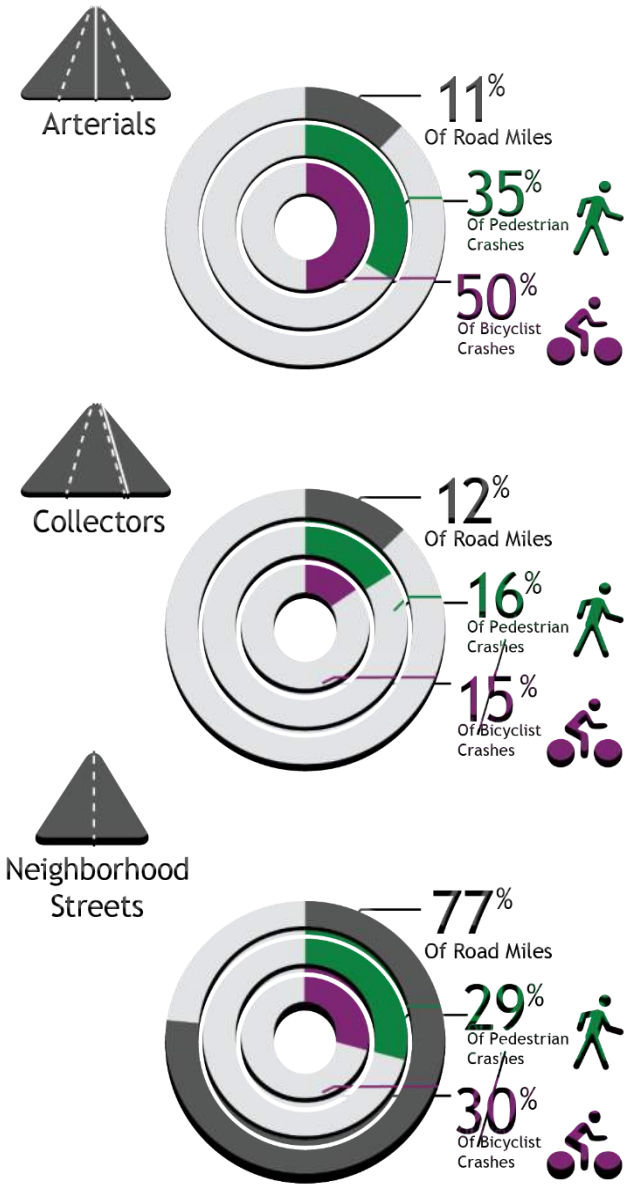


Figure 4. Pedestrian and Bicyclist-involved Crashes by Roadway Classification

Understanding Equity

Transportation facilities are essential components in helping to create opportunities for New Hampshire residents and for reducing the disproportionate economic and health burdens experienced by the state's most vulnerable residents.[12] Concentrations of vulnerable users in areas with limited transportation infrastructure can contribute to longer travel times, more expensive commutes, and unsafe travel conditions. The following summary of key equity indicators (from 2013-2017 American Community Survey estimates), identify communities of concern within New Hampshire.

Approximately 19 percent of New Hampshire's population is over 65 years old. That is projected to increase to 27 percent by 2030 and 28 percent by 2040.[13] AARP estimates that 1 in 5 Americans over age 65 do not drive. This age shift will significantly change the needs of the traveling public in New Hampshire in the coming decade.

Approximately 18 percent of New Hampshire's population is under 18 years old. The population under 18 years of age has a higher active transportation infrastructure need because they have less access to motor vehicles and may rely more on alternative modes of transportation.

In New Hampshire, 13 percent of residents report having a disability.[14] Affordable and reliable transportation allows people with disabilities—especially those in rural areas—to access educational, employment, housing, healthcare, and community-based opportunities.

People of color make up approximately 7 percent of New Hampshire's population. Nationally, racial or ethnic minorities are more likely to live in areas with poor or limited active transportation facilities, educational opportunities, job resources, and healthy food outlets.[15,16]

In New Hampshire, approximately 7 percent of the population are considered to be in poverty. Nationally, poverty is linked with disproportionate exposure to poor housing conditions and limited access to resources, such as transportation services, healthy food, recreation facilities, and healthcare facilities.

Approximately 7 percent of New Hampshire residents over 25 years do not have a high school diploma. Nationwide those without high school diplomas have the highest rates of walking and the second highest rates of bicycling to and from work.[17] These individuals may depend on active transportation due to financial constraints and lack of adequate and/or convenient transportation options.

In New Hampshire, 5 percent of households do not have any vehicles available, and 30 percent have one vehicle available, though many of those are two-worker households. A heavy reliance on motor vehicles can come at a great expense to personal and household budgets. On average, low-income families spend 30 percent of their income on transportation expenses.

Level of Traffic Stress Analysis

Overview

The Bicycle Level of Traffic Stress (LTS) analysis is a tool to evaluate objectively the experience for someone bicycling on any roadway by assigning scores to the roadway based on roadway characteristics such as posted speed limit, number of traffic lanes, traffic volumes, and type and width of bicycle facility present. The analysis can help to identify high-stress gaps in a network and identify where improved bicycle facilities are needed. **A measure of how many miles of low-stress route exist is less useful than how many desired trip origins and destinations are connected by low-stress route.** For example, a child might be able to bicycle from their neighborhood to school on a low-stress route except for the crossing of a busy arterial. Crossing improvements at that arterial might enable many more bicycle trips than miles of bicycle route in another location. A complete summary including details on the methodology are available in Appendix 2. The following graphic highlights the four different LTS scores, the number of miles of the NHDOT network with that score and a corresponding description of the experience of roadways with each score. The remaining 12 percent of the road network that is not represented in the graphic below consists of roadways where bicycling is prohibited.

LTS 1 (Lowest Stress)	LTS 2	LTS 3	LTS 4 (Highest Stress)
3 miles *(<1% of existing roads)*	***902 miles*** *(19% of existing roads)*	***2128 miles*** *(45% of existing roads)*	***1076 miles*** *(23% of existing roads)*
Roadways with strong separation between motor vehicles and bicyclists, or roadways with an exceptionally low number of daily motor vehicles traveling at low speeds. Suitable for children. Facilities separated from traffic, like rail trails, are also LTS 1 but are not included in these miles.	Except along low speed/low volume facilities, bicyclists have their own place to ride that keeps them from having to interact with traffic. Physical separation from higher speed and multi-lane traffic. Suitable for most adults.	Roadways with no designated bikeways, multi-lane traffic, and motor vehicles traveling at moderate speeds. Suitable for some adults.	Roadways with no designated bikeways, multi-lane traffic, and motor vehicles traveling at high speeds. Suitable for a limited number of adults.

Chapter 3: Policy and Practice Recommendations

This chapter identifies policies and general practice recommendations that support active transportation through evaluation, enforcement, education, and encouragement.

In this Chapter:

- **Coordination Efforts**
- **Non-Infrastructure Recommendations: Four E's**
- **Safety Recommendations**
- **General Practice Recommendations**

Ocean Boulevard in Hampton Beach, NH

Coordination Efforts

While physical infrastructure such as sidewalks, bike lanes, buffered and separated bike lanes, sidepaths, and trails are critical components of a safe, comfortable, and connected active transportation network, it is also important to develop policies, programs, and general practices to help make New Hampshire a truly bicycle and pedestrian-friendly state. The opportunities to expand active transportation and improve the conditions for pedestrians and bicyclists are expansive and dependent upon many agencies, jurisdictions, and organizations throughout New Hampshire working collaboratively. **The following highlights some of the partnerships that should be developed and/or leveraged to help advance recommendations contained in this Plan**.

NHDOT	• Refine and track performance measures • Develop design checklists related to non-motorized facilities • Set expectations and guidance for designing for all users • Provide guidelines and details for bicycle and pedestrian facilities • Improve interagency data sharing • Recommend RPCs include non-motorized needs in their evaluation criteria
RPCs	• Conduct project prioritization, scoping and development • Explore regional active transportation planning initiatives • Promote multi-agency collaboration • Develop GIS mapping for LTS, networks, and improvements priorities • Collect pedestrian and bicyclist count data as well as speed data • Provide technical assistance for local planning, policy, and practices • Test demonstration and pilot education and enforcement programs
Local Governments	• Adopt local planning and policies, including Complete Streets policies • Provide local funding to implement projects • Conduct education, safety, and encouragement programs • Maintain local roadway and active transportation network • Develop GIS mapping of existing and proposed active transportation networks
NHDOT and Other State and Federal Agencies	• Integrate planning efforts • Improve crash data collection practices and quality • Leverage resources • Formalize partnerships • Identify funding mechanisms • Provide guidelines and technical training • Expand police officer training • Refine driver safety education programs
Advocates and Nonprofits	• Support education, safety, and encouragement programs • Conduct political and governmental engagement • Ensure equitable engagement practices • Conduct promotion and fundraising efforts

Non-Infrastructure Recommendations: Four E's

Existing statewide programs and media campaigns intended to promote and encourage more people to use active transportation for commuting and everyday trips were reviewed as part of the Plan. The non-infrastructure recommendations of this Plan—Evaluation, Education, Encouragement, and Enforcement are programs intended to further promote these efforts (see graphics below). This section of the Plan provides recommendations for policies and general practice relating to active transportation in New Hampshire. The parties responsible for each recommendation are identified in Chapter 6, *Plan Implementation*.

Monitor efforts to increase active transportation and plan for the future

Recommendations:

- Develop a coordinated statewide pedestrian and bicycle count program including the use of permanent automated counters, short-term counters, and the consideration of big data mined from mobile and/or navigational devices.
- Improve tracking and analysis of bicycle and pedestrian crashes and trends, including expanded data collection efforts
- Prioritize acquisition of data to support Active Transportation Performance Measures (see Ch. 6)
- Define baselines and targets for Active Transportation Performance Measures
- Take steps to improve network data in order to accurately track changes in LTS classification, including shoulder width

Enforce safe and responsible behaviors on the road and build respect among all road users

Recommendations:

- Continue to encourage laws like NH's 3-foot law, to help protect vulnerable road users
- Conduct expanded academy and in-service training for Law Enforcement Officers on current state law related to bicycling, and enforcement techniques for the state's 3 foot passing buffer and hand-held device laws
- Counter the celebration or "culture" of speed by creating a stigma for speeding similar to that for impaired driving
- Consider Automated Speed Enforcement to decrease fatal and serious crashes of all types
- Improve crash report data collection and interagency data sharing, including increased attention to identifying driver distraction

Equip people with the knowledge to make biking and walking safer

Recommendations:

- Educate drivers about safe driving near pedestrians and bicyclists
- Improve public awareness of the consequence of excessive speed
- Conduct a Public Active Transportation Safety Campaign for pedestrians and bicyclists
- Incorporate Active Transportation curriculum into drivers' education courses
- Develop Bicycle- and Pedestrian-Friendly Driver Safety Training Resources for NHDOT Staff as a pilot for other agencies and municipalities
- Educate legislators and other elected officials, as well as the general public, on the benefits and needs of active transportation
- Incorporate training on Dutch Reach (see Ch. 2) in driver safety education to reduce dooring as a cause of bicycle crashes

Foster a culture that supports and encourages active transportation

Recommendations:

- Encourage active transportation by participating in and supporting activities such as CommuteSmart New Hampshire
- Brand the New Hampshire Bicycle Network and develop promotional collateral, such as a statewide bike route map
- Host public events to promote traffic safety and share resources about key networks across the state
- Design, develop, and update Statewide Bicycle Network or LTS Maps online
- Develop a Statewide Lending Library of equipment (traffic tape, safety vests, etc.) for hosting Complete Streets demonstration projects
- Encourage municipalities and businesses to achieve Bike Friendly designation from the League of American Bicyclists

Safety Recommendations

A number of specific policies related to the design and operation of the roadway system have the potential to significantly impact pedestrian and bicyclist safety and comfort. Historically, these practices were often originally developed around the demands of motor vehicles, and adjustments to the policies may be appropriate to ensure they account for the needs of non-motorized users as well. The following policies and practices are recommended:

- **Speed limits** - A significant factor in the severity of collisions involving vulnerable users is the speed motor vehicles are traveling during the crash. Low travel speeds resulting from roadway context and geometry are important factors in increasing safety for bicyclists and pedestrians. Posting a lower speed limit on its own is unlikely to meaningfully reduce travel speeds, but NHDOT will work with interested municipalities to develop roadway designs that support slower speeds when projects are evaluated in areas with existing or potential high pedestrian and bicycle use. In addition, the design speed will be determined based on a desired 'target speed' and will include design elements to achieve reduced speed.

- **Reallocation of roadway space** - One of the most feasible and cost-effective ways to improve infrastructure for pedestrians and bicyclists is through the reallocation of roadway space via pavement restriping during resurfacing projects. The following recommendations would consistently support reallocating space to encourage active transportation:
  - NHDOT will set the default travel lane width at 11’ on resurfacing projects except on freeways (Tier 1 facilities: interstates, turnpikes, and divided highways) and specific roadways with particular traffic characteristics, such as those with high truck volumes.
  - NHDOT will establish criteria or evaluate roadway segments on a case-by case basis for lane widths as narrow as 10’ on roadways with certain characteristics (such as low volumes, low speed, low truck traffic, and/or low density of curb-cuts).
  - NHDOT will incorporate allocation of space for pedestrian and bicycle facilities in the Highway Design Manual.
  - NHDOT should establish a convenient inventory of lane widths, especially those that intentionally vary from the default value, so that the desired widths will be maintained in perpetuity.

- **Leverage evolving technologies to help collect and manage data** - One challenge in meeting the needs of pedestrians and bicyclists is the lack of data. Developing and maintaining a non-motorized data-collection program and/or using a service that already collects user usage passively from cell phones will help to support planning and funding efforts for roadway safety initiatives and pedestrian and bicycle facilities. Improved data collection, such as shoulder width, travel speed and volume, will also provide the needed data for the state to analyze level of traffic stress (LTS) for bicyclists over a long-term period (supplementing the LTS analysis completed recently for this planning effort and by a team comprised on the state’s MPOs and Plymouth State University).

General Practice Recommendations

Additional recommendations to promote safety for all roadway users include:

- Utilizing funding, such as HSIP, for active transportation education and encouragement programming such as Public Service Announcements (in coordination with the NH Department of Safety) and/or state highway variable message signs that relate to pedestrians and bicyclists.
- Coordination with other State agencies (in conjunction with the Complete Streets Advisory Committee) to accomplish the safety, access, and culture goals of this plan. Consider formally including these other agencies, such as the Department of Safety (DOS) as CSAC members.
- Mode shift to active transportation promotion that results in increased safety and normalizes active transportation.
- Coordinate and promote best practices throughout DOT Bureaus, across DOT Maintenance Districts and to the Regional Planning Commissions.
- Collect and analyze transportation safety, usage, and infrastructure data:
    - Work with DOS to improve crash data reporting accuracy.
    - Develop a statewide non-motorized data collection program to understand travel of all users allowing for comprehensive project planning and detailed performance measures.
    - Obtain more detailed travel way and shoulder width data to more accurately identify roadway segments to be reallocated and more accurately define the LTS mapping.

Pop-up demonstration: Middle Street, Portsmouth, NH

Chapter 4: Complete Streets

This chapter presents background information on the concept of Complete Streets, including NHDOT's current approach and its application to date in the United States, a discussion of the new Infrastructure Investment and Jobs Act (2021), as well as sample language for a future policy and a high-level discussion of best practices for implementation of a Complete Streets approach.

In this Chapter:

- **NHDOT's Current Approach**
- **Why Complete Streets?**
- **Complete Streets in the United States**
- **Complete Streets Expansion Strategies**

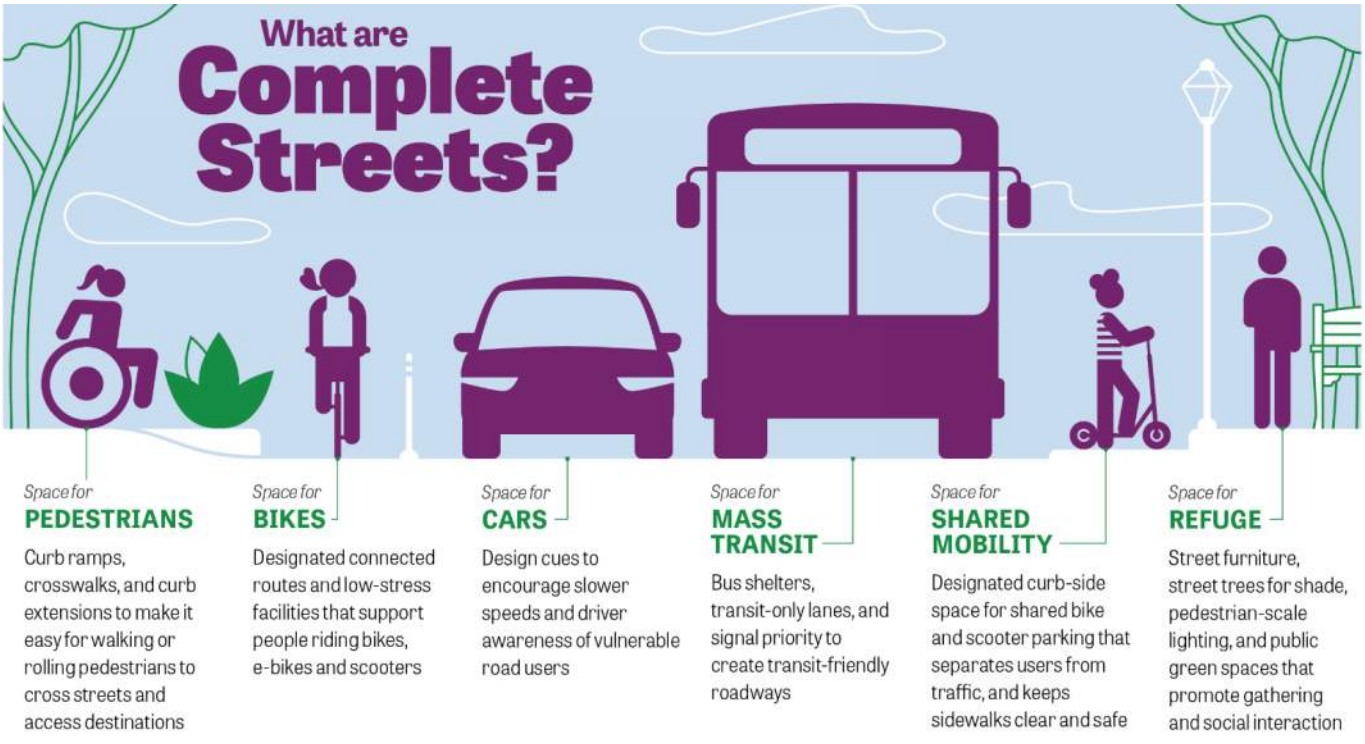
NHDOT's Current Approach

Although NHDOT does not have a formal Complete Streets policy, these principles are not new to the Department. NHDOT formalized the Context-Sensitive Solutions (CSS) approach to proactively involve the public in the early stages of the development of NHDOT projects in a community. The CSS approach commits NHDOT to a process that encourages transportation officials to collaborate with stakeholders from the community, as well as environmental resource groups, so that the design of a project reflects the goals of the people who live, work and travel in the area. This is the best time to discuss a community's vison and goals based on available funding. Complete Streets features, such as ADA compliant sidewalks, curb extensions, bike lanes, bus stops, and appropriately configured travel lanes, are included in NHDOT and Local Public Agency projects in the appropriate context when possible. The following sections describe Complete Streets principles in detail and discuss how NHDOT can expand its current practice.

Why Complete Streets?

The "Complete Streets" framework for transportation planning has become increasingly well-known over the course of the past few decades. A main advocate for Complete Streets in the United States, Smart Growth America, defined Complete Streets as "an approach to planning, designing and building streets that enable safe access for all users, including pedestrians, bicyclists, motorists, and transit riders of all ages and abilities."[18] In addition, FHWA has established a Complete Streets initiative that works with transportation agencies to implement Complete Streets design models that prioritize safety, comfort, and connectivity to destinations for everyone who uses the street network.[19] Beyond simply affording non-drivers equal access to public streets, the Complete Streets approach also seeks to consider the needs of communities such as people with disabilities, youth and seniors, people who do not have access to a motor vehicle, lower-income people, and people of color.

The overarching goal of implementing Complete Streets policies is not to reproduce the same type of street in communities across the country—rather, Complete Streets is an approach that allows for street design to respond effectively to the needs and context of the road and community. This focus on making streets safe for all road users contrasts with decades of prior transportation planning, which prioritized moving vehicles as quickly as possible with the unintended cost to the safety of other road users, especially bicyclists and pedestrians. A Complete Streets approach may require new and innovative ways to relieve traffic congestion, public acceptance of varying levels of congestion, and/or a willingness to alter personal transportation modes or patterns to avoid congestion. A complete street may include any number of infrastructure changes, such as sidewalks, bike lanes, public transit stops, bus lanes, median islands, crosswalks, curb extensions, roundabouts, and beyond, that will allow for a safer environment for all roadway users (including vulnerable users and those in motor vehicles).



The increasing emphasis on Complete Streets approach/policy adoption and implementation strategies in the United States is due, at least in part, to the alarming upward trend in pedestrian traffic deaths over the course of the past few decades. The Complete Streets approach helps shift the paradigm of traffic safety, and for this reason, is a great fit for New Hampshire's Driving Toward Zero effort.

Complete Streets infrastructure recommendations will depend on roadway character, surrounding land use, and other factors. Not every street should have the same design elements. The photos below and on the next page show existing facilities in New Hampshire and illustrate how the rural, suburban, and urban zone designations might determine which Complete Streets elements are context-appropriate.

Rural Zone

Applies to: Forested, Agricultural Areas, Sparsely Populated

Example Complete Streets Improvements: Wider shoulders, bicycle route signs

Francestown Road, Bennington, NH

Jericho Road, Berlin, NH

Suburban Zone

Applies to: Suburban, Rural Downtown

Example Complete Streets Improvements: Wider sidewalks and additional green infrastructure, enhanced crossings, sidepaths

Amherst Street: Nashua, NH

NH-114A: Pinardville (Goffstown), NH

Urban Zone

Applies to: Rural Community, Urban, Urban Core

Example Complete Streets Improvements: Sidewalks on both sides of the roadway, marked crosswalks and pedestrian signals, bike lanes or separated bikeways, marked shared roadways (sharrows), bike boulevard

Main Street: Concord, NH

Main Street: Nashua, NH

State vs. Local Complete Streets Approach/Policy Elements

While state DOT action is crucial for Complete Streets principles to be considered, local jurisdictions also have an opportunity to develop their own Complete Streets guiding documents. Using guidance from the National Complete Streets Coalition's, a program of Smart Growth America, ten elements[20] of a complete street policy, the following summary highlights the differences between complete street policy elements that are applicable at the state level compared to other elements that, in New Hampshire, would usually be made at the local level.

At the **state level**, many Complete Streets policies include the following recommended elements:

- **Vision and intent:** Includes an equitable vision for how and why the community wants to complete its streets. Specifies need to create complete, connected, network and specifies at least four modes, two of which must be biking or walking.
- **Commitment in all projects and phases:** Applies to new, retrofit/reconstruction, maintenance, and ongoing projects.
- **Clear, accountable exceptions:** Makes any exceptions specific and sets a clear procedure that requires high-level approval and public notice prior to exceptions being granted.
- **Collaboration:** Requires interagency coordination between government departments and partner agencies on Complete Streets.
- **Design:** Directs the use of the latest and best design criteria and guidelines.

At the **regional or local level**, a Complete Streets policy/approach or implementation guide that builds on a state approach or policy directive should include the following elements to make it context-appropriate:

- **Diverse users:** Benefits all users equitably, particularly vulnerable users and the most underinvested and underserved communities.
- **Design:** Coordinates and sets a timeframe for implementation.
- **Land use and context sensitivity:** Considers the surrounding community's current and expected land use and transportation needs.

- **Performance measures:** Establishes performance standards that are specific, equitable, and available to the public.
- **Project selection criteria:** Provides specific criteria to encourage funding prioritization for Complete Streets implementation.
- **Implementation plan:** Includes specific next steps for implementation of the policy.

Complete Streets in the United States

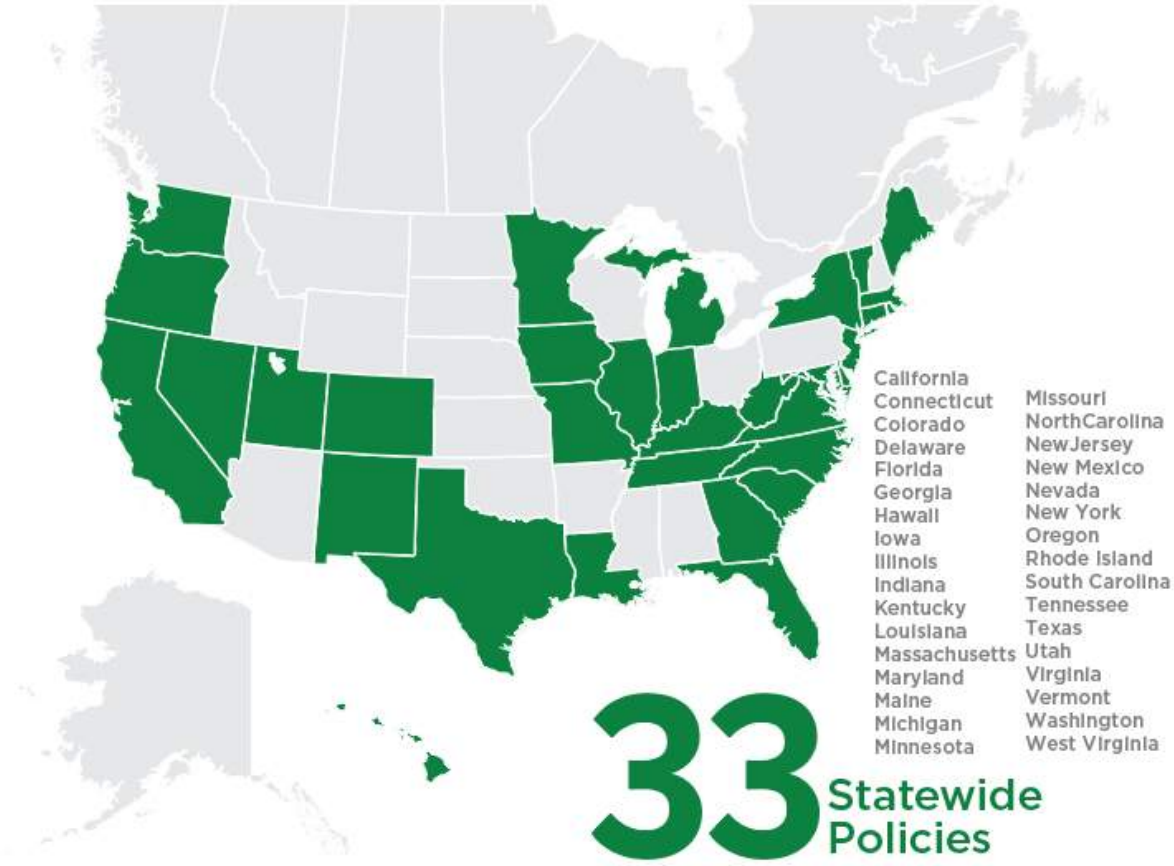
Since 2000, over 1,700 Complete Streets policies have been passed in the United States, with 33 of these being adopted by the District of Columbia, the Commonwealth of Puerto Rico, and other state governments. These policies vary in their comprehensiveness as well as their implementation strategies and timelines. Complete Streets policies have been adopted by New Hampshire's neighboring states of Vermont (in 2011) and Maine (in 2014, revised July 2019), as well as numerous communities, including the City of Portsmouth, New Hampshire (in 2013). The 2021 Bipartisan Infrastructure Law (BIL) also known as the Infrastructure Investment and Jobs Act (IIJA) defines Complete Streets standards and policies at the national level and requires that MPOs use 2.5% of their overall funding to develop and adopt Complete Streets policies, active transportation plans, transit access plans, transit-oriented development plans, or regional intercity rail plans.

Complete Streets Expansion Strategies

Smart Growth America has published a guidebook to Complete Streets Implementation that draws on current best practices around the country. Creating a formal implementation plan is an option that many jurisdictions have chosen, but it is not the only way to ensure Complete Streets policy compliance. Within the New Hampshire context, the Complete Streets Advisory Committee has already begun the work of advocating for greater support for walking, bicycling, and transit throughout the state, and would be an ideal candidate for the "champion" of complete streets implementation. Chapter 3 of the North Carolina DOT's Complete Streets Planning and Design Guidelines[21] contain extensive recommendations (pg. 18-29) for ensuring a collaborative design process between municipalities, MPOs, and state agencies that result in transportation projects that conform to Complete Streets goals and ideals. Expansion of NHDOT's current approach (as recommended in Chapter 6 - *Plan Implementation*) will help make sure that Complete Streets strategies are considered in all projects and phases consistently and should include the development of design criteria and guidelines that accommodate all users.

Statewide Complete Streets Policy Examples

66 percent of states (33 out of 50) have enacted a form of Complete Streets policy at the time of this plan's writing. Some of these are state DOT policies or department directives, while some are legislative acts.



For states that have multiple guiding documents for Complete Streets, the most relevant document (in most cases, the original policy) is linked below.

- California[22]
- Connecticut[23]
- Colorado[24]
- Delaware[25]
- Florida[26]
- Georgia[27]
- Hawaii[28]
- Iowa[29]
- Illinois[30]
- Indiana[31]
- Kentucky[32]
- Louisiana[33]
- Massachusetts[34]
- Maryland[35]
- Maine[36]
- Michigan[37]
- Minnesota[38]
- Missouri[39]
- North Carolina[40]
- New Jersey[41]
- New Mexico[42]
- Nevada[43]
- New York[44]
- Oregon[45]
- Puerto Rico[46]
- Rhode Island[47]
- South Carolina[48]
- Tennessee[49]
- Texas[50]
- Utah[51]
- Virginia[52]
- Vermont[53]
- Washington[54] (pg. 89)
- West Virginia[55]

Complete Streets Design Guidelines

Once a Complete Streets policy has been adopted or NHDOT's current approach has been expanded, the next step for many jurisdictions is the formulation of a set of design guidelines. In the case of Portsmouth, New Hampshire, adoption of the Complete Streets Policy in 2013 was followed by the 2014 Portsmouth Bicycle and Pedestrian Plan, which mapped priority bicycle and pedestrian network connections and included a toolkit of design solutions to provide accommodations for all users. The 2017 Complete Streets Design Guidelines document builds upon the two prior planning efforts and places each roadway in Portsmouth into one of seven categories. For each roadway classification, the document includes a typical cross section of the street type, the typical street features for the street type, and proposed design guidelines for that street type.[56] While Portsmouth's roadway classifications are suitable for a small and relatively compact urban area, design guidelines for New Hampshire at a statewide level may look very different, given the state's variety of urban, suburban, and rural contexts, as illustrated in photos above. Chapter 3 of the North Carolina DOT's Complete Streets Planning and Design Guidelines[57] provides a good example of a state-level overview of how and where complete streets interventions can best be applied.

Example Complete Streets Policy Language

MaineDOT's Complete Streets policy[58] could serve as a model policy for New Hampshire to use to develop their own language. In addition to a core policy, MaineDOT also has a brief section detailing the policy's purpose and intent, the process for determining project merit and feasibility (including the types of projects that may be exempted from the policy), assignment of financial responsibility, implementation, and amendments.

Recommended Starting Point for New Hampshire Complete Streets Policy Language

To reflect NHDOT's commitment to Complete Streets, it is recommended that NHDOT adopt a Complete Streets Policy or expand their approach to clearly document an equitable vision, ensure commitment in all projects and phases (new, retrofit/reconstruction, maintenance, and ongoing projects), set clear accountable exceptions, and direct the use of the latest and best design criteria and guidelines. See the proposed language below.

"*It is the policy or approach of the New Hampshire Department of Transportation to consider the needs of all users in the planning and development of street and highway improvement projects. This policy applies to new construction, reconstruction, rehabilitation, and maintenance projects funded partially or in full through NHDOT, and also includes projects programmed by Regional Planning Commissions, or local jurisdictions. NHDOT and/or its project partners will document the process by which the needs of all users are considered in the planning and development of street and highway improvement projects. This documentation will include analysis of how the various users of the transportation system will have safe access to the completed street and highway project, where warranted and feasible or, if certain user accommodations are determined not to be warranted or feasible, the basis for that determination. Documentation of the process that has been followed to consider the needs of all users will be included in project scoping reports and preliminary design reports*."

Chapter 5: Desired Pedestrian and Bikeway Networks

This chapter presents the desired pedestrian and bicycle networks. Although the desired networks include both local and state owned and maintained roadways, emphasis is on those owned and maintained by the state. This chapter also includes a summary of the approach used for network development which builds on the analyses, public input, and existing conditions review.

In this Chapter:

- **Approach to Network Development**
- **Desired Pedestrian Network**
- **Desired Bikeway Network**
- **Level of Traffic Stress Analysis of Desired Network**
- **Spot Improvements**
- **Network Improvement Priorities by RPC**

Whittier Highway (NH 25), Moultonborough, NH

Approach to Network Development

The network development process used a collaborative approach, building on the existing condition analyses, public input, and iteratively working with RPC representatives to develop bicycle networks recommendations tailored to each region. The bicycle and sidewalk networks were distributed to RPC representatives for their review and refinement of their region's network to identify missing gaps and to propose additional recommendations including facilities and spot improvements. Spot improvements are commonly intersection or crossing improvements, or safety improvements along existing facilities. As a result of this collaborative approach, the networks developed are very context-sensitive, responding to the needs and capacities of each RPC.

The interactive webmaps of the desired sidewalk and bicycle networks and the Bicycle Level of Traffic Stress developed as part of this Plan will be hosted online. These webmaps will be a tool for internal NHDOT and RPC data sharing and for communicating externally with stakeholders and the general public.

The desired network is envisioned to be grouped into three categories:

- Desired pedestrian network
- Desired bikeway network
- Spot improvements

As a parallel effort in the development of this Plan's desired pedestrian and bicycle network, each RPC identified ten major, ten minor, and numerous spot improvement priority needs within their regions. These RPC priority needs, which are included in the overall desired network, are not specifically listed in this Plan as they will need to be reviewed and updated by each RPC on a regular basis to ensure accuracy and changing community needs and priorities.

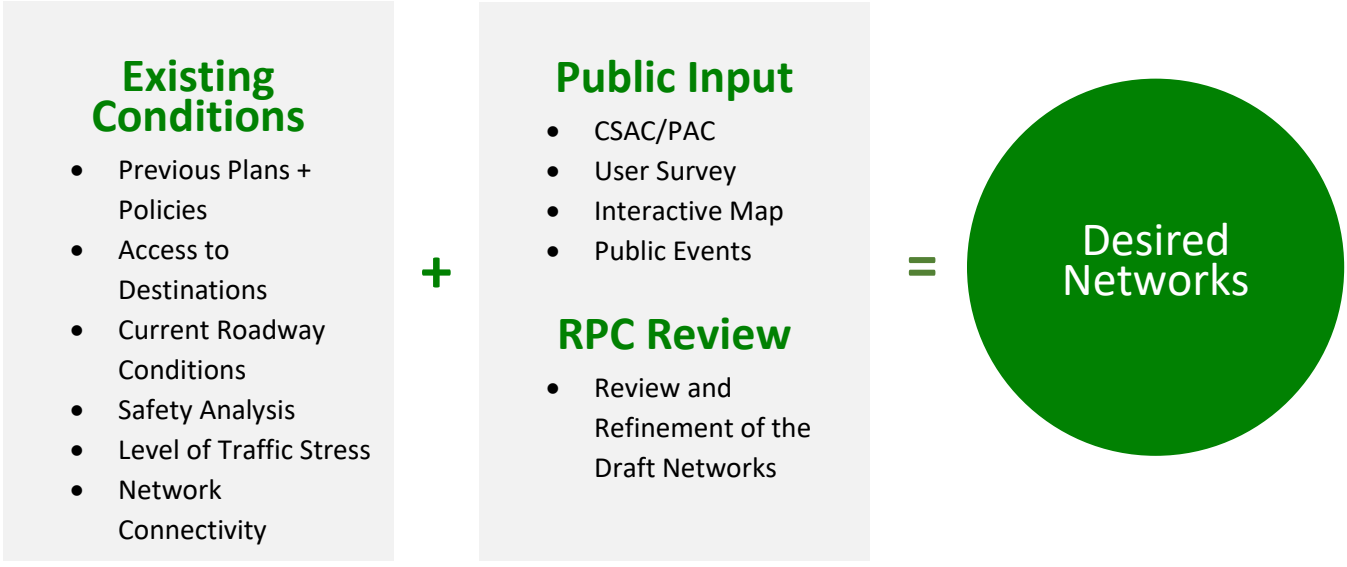


Figure 5. Network Development Approach

Desired Pedestrian Network

The proposed desired sidewalk network is presented in *Table 5* and *Figure 6*. The desired sidewalk network includes existing sidewalks, existing sidewalks that need improvements, and new sidewalk projects.
Locations where sidewalks should be considered in the future include:

- State-owned roadways and locally-owned numbered roadways through town and village centers that lack a sidewalk on one or both sides.
- Locally-owned numbered roadways through Urban Compact Areas where at least a modest level (qualitative) of residential and commercial density exists and where destinations are present.
- In either option above, sidewalks on both sides of the roadway are preferred except in cases where land development has yet to occur or where there are physical constraints on one side of the roadway.

The desired sidewalk network is only a snapshot of missing sidewalk gaps identified by each RPC or through public feedback. The desired network does not include all the sidewalks that will be built over time, such as sidewalks implemented as part of new roadway projects and through land development.

Table 5. Desired Sidewalk Centerline Miles by RPC

Regional Planning Commission	Existing Sidewalk (Centerline Miles)	Proposed Additional Desired Sidewalk (Centerline Miles)	Total Desired Sidewalk Network
Central New Hampshire	45	19	64
Lakes	47	15	62
Nashua	67	36	103
North Country Council	61	5	66
Rockingham	49	21	70
Southern New Hampshire	113	131	244
Southwest New Hampshire	30	138	168
Strafford	43	3	46
Upper Valley Lake Sunapee	35	6	41
Total Statewide	**490**	**374**	**864**

Data represents local roadways, roadways owned and maintained by NHDOT and numbered roadways within Urban Compact Area.

Pedestrian Visual Legend

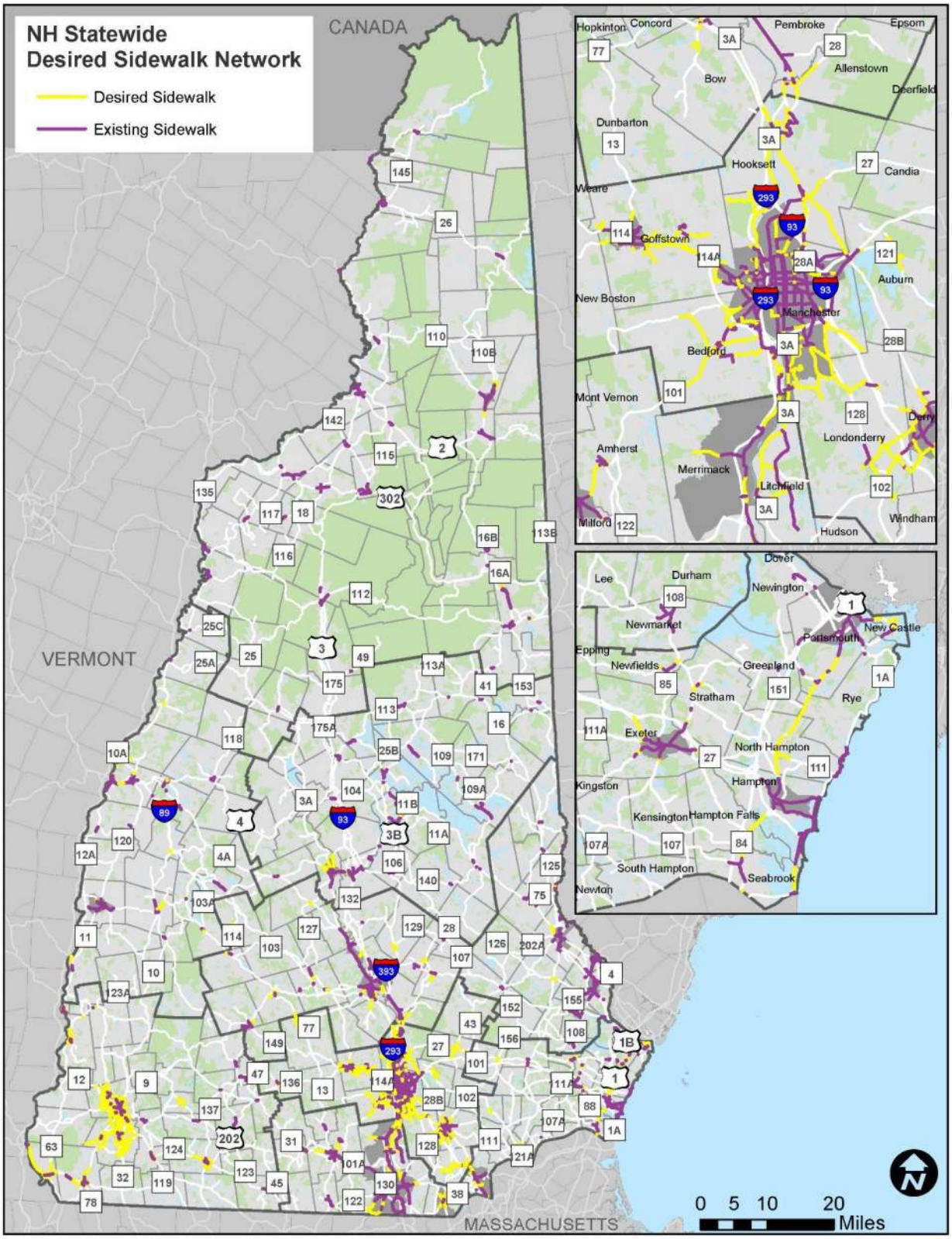
The following images show examples of what the desired pedestrian network facilities may look like. This Plan does not prescribe what type of sidewalk should be implemented, leaving that to be part of the project implementation process, which will involve local jurisdictions, community involvement, and additional study to identify a context-sensitive improvement.

Sidewalks with no buffer

Sidewalks with buffer

Wide sidewalks with streetscape elements

Figure 6. Desired Pedestrian Network Map



This figure is a high-level view of the desired sidewalk network. The interactive webmap, a key recommendation of this plan, may be used to see specific areas in more detail.

Desired Bikeway Network

The proposed desired bikeway network is presented in *Figure 7* and *Table 6* (however, *Table 6* includes only that portion of the network on NHDOT owned and maintained roadways, and numbered routes within urban compact areas.). The network includes existing trails and bikeways that are fine as-is, existing trails and bikeways that need improvements, and new trails and bikeway recommendations. Note that this Plan does not propose the type of bikeway facility that should be implemented, but provides a framework and references to best practices and guidance to support decision-making on facility selection. The RPCs played a key role in developing the desired bikeway networks, utilizing local knowledge of existing conditions and needs.

> The desired bikeway network is flexible, and if during implementation a parallel route is found to be preferable, then it should be pursued. The desired bikeway network is intended to start the conversation around how people can travel by bike throughout New Hampshire.

Critical factors that influenced the selection of the desired bikeway development include:

- Inventory of existing and funded future connections
- Identification of key origins and destinations
- Level of Traffic Stress
- Public engagement (CSAC/PAC review, RPC TAC meetings, public events, online survey and map input)
- Existing conditions review

Table 6. Desired Bikeway and Trail Network Centerline Miles by RPC

Regional Planning Commission	Desired Trail	Existing Trail	Desired Bikeway
Central New Hampshire	75	23	188
Lakes	3	87	240
Nashua	42	30	217
North Country Council	5	86	397
Rockingham	25	49	263
Southern New Hampshire	36	60	367
Southwest New Hampshire	113	21	676
Strafford	1	22	181
Upper Valley Lake Sunapee	13	46	247
Total Statewide	**313**	**424**	**2,776**

Data regarding desired bikeways represent roadways owned and maintained by NHDOT and numbered roadways within Urban Compact Area.

Level of Traffic Stress Analysis of Desired Network

The Bicycle Level of Traffic Stress (LTS) analysis results (as described in more detail in Chapter 2 and Appendix 2) is an important tool that helps to identify locations in a network that may attract or deter people from riding bicycles. This analysis can affect network implementation by providing the opportunity to prioritize user comfort and minimize or eliminate factors of stress in higher-stress locations. A continuous low-stress network is essential for bicyclists of all ages and abilities to travel easily throughout the network. Prioritizing comfort in a recommended network ensures that bicyclists with different abilities can be encouraged to use facilities and can increase use of facilities by a broader segment of the population. The graphic below highlights the four different LTS existing scores, the number of miles of the desired on-road bikeway network (both NHDOT and locally owned) with that score when this plan was developed, and a corresponding description of the experience of roadways with each score. **Note that proposed rail trail mileage is not included in the desired network mileage totals, even though they have a LTS of 1, since the LTS score was calculated for on-road facilities using attributes of the roadway network.** Existing facilities were included in the desired network calculation below as well.

LTS 1 (Lowest Stress)	LTS 2	LTS 3	LTS 4 (Highest Stress)
742 miles *(20% of desired network)*	***719 miles*** *(19% of desired network)*	***1518 miles*** *(40% of desired network)*	***768 miles*** *(21% of desired network)*
Roadways with strong separation between motor vehicles and bicyclists or roadways with an exceptionally low number of daily motor vehicles traveling at low speeds. Suitable for children. This total does not include facilities separated from traffic (rail trails), which are also LTS 1.	Except along low speed/low volume facilities, bicyclists have their own place to ride that keeps them from having to interact with traffic. Physical separation from higher speed and multi-lane traffic. Suitable for most adults.	Roadways with no designated bikeways, multi-lane traffic, and motor vehicles traveling at moderate speeds. Suitable for some adults.	Roadways with no designated bikeways, multi-lane traffic, and motor vehicles traveling at high speeds. Suitable for a limited number of adults.

Bikeway Visual Legend

The following images show some examples of the types of facilities that will be built as part of the desired bikeway network. This Plan does not identify what type of facility should be implemented. During the implementation phase, the facility type will be identified based on feasibility with involvement from the local community and RPC, while aligning with best practices in design guidance.

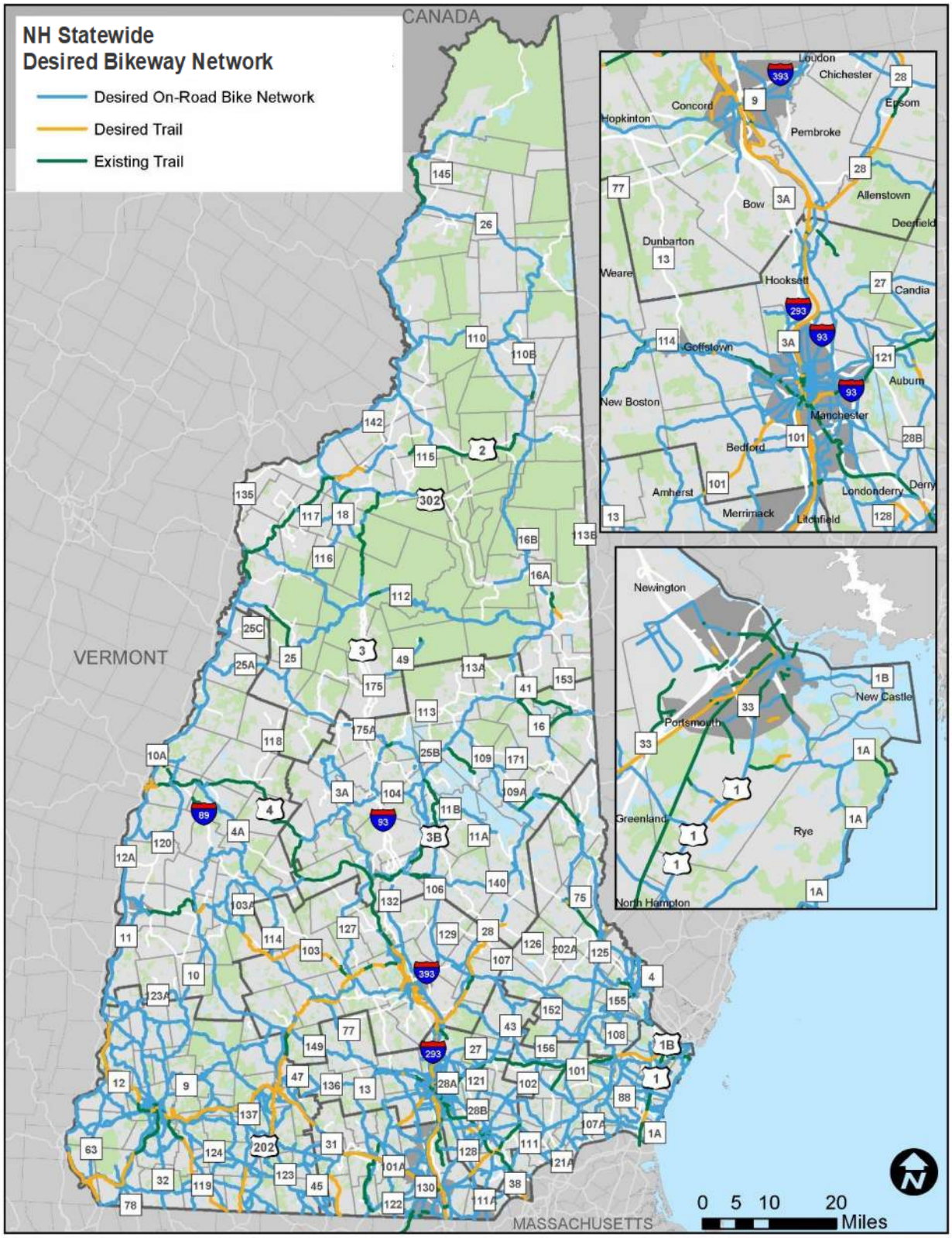
Sidepath along the roadway

Bicycle lanes

Wider paved shoulders

Bicycle regulatory signage

Figure 7. Desired Bikeway Network Map



This figure is a high-level view of the desired bikeway network. The interactive webmap, a key recommendation of this plan, may be used to see specific areas in more detail.

Spot Improvements

Spot Improvements are measures implemented at specific locations along bicycle and pedestrian networks with the intention of enhancing accommodations for users at points that are difficult to cross, or uncomfortable to use. Spot improvements can include traffic calming and safety improvements, intersection and crossing improvements such as new at-grade crossings, Rectangular Rapid Flashing Beacons (RRFBs), Pedestrian Hybrid Beacons (PHBs), or the addition of pedestrian signals at existing traffic signals, as well as pedestrian and bicycle bridges, underpasses, or railroad crossings.

> The identified spot improvements are a starting point, and do not capture all the potential or desired locations for spot improvements. Additional data collection, public input, and staff review is needed to identify a comprehensive list of needed spot improvements in each RPC region.

The RPC representatives specifically identified spot improvement locations within their region, and therefore the spot improvements are contextual and based on the need and capacity of each region, and are not meant to capture all potential locations for spot improvements within that RPC. As a result, the spot improvements should be updated on an on-going basis.

Table 7. Desired Spot Improvements

Regional Planning Commission	Spot Improvements
Central New Hampshire	7
Lakes	4
Nashua	22
North Country Council	3
Rockingham	17
Southern New Hampshire	26
Southwest New Hampshire	51
Strafford	6
Upper Valley Lake Sunapee	10
Total Statewide	**146**

Spot Improvement Visual Legend

The following images show examples of different types of spot improvement projects. As the RPCs identified the spot improvements, they identified what type of improvements are recommended to address known location-specific issues.

Crossing improvements

Rectangular Rapid Flashing Beacon (RRFB)

Pedestrian Hybrid Beacon (PHB)

Grade separated crossing

Network Improvement Priorities by RPC

Why Prioritize?

Identifying priorities highlights which needs are important for regions' networks and should be a priority for implementation. Prioritization is integral to understanding which community needs from across the state should be the focus for funding.

> The identification of priorities was specific to each RPC. RPCs were encouraged to consider safety, connectivity, access, public input, or other previous planning processes and to note rationale for priorities.

Approach to Prioritization

RPC representatives reviewed their regions to determine which needs from the bikeway network, sidewalk network, and spot improvements should be prioritized as major and minor priorities. RPCs identified 10 major and 10 minor priorities for a total of 20 priority projects. A major priority might be a size that could be funded through the NHDOT Ten-Year Plan while a minor priority may be a size that could be funded through a Transportation Alternative Program (TAP) or Congestion Mitigation and Air Quality Improvementand (CMAQ) grant. The RPCs also developed a list of spot improvements.

Prioritization Results Summary

The priorities are summarized in *Table 8*.

Table 8. Priority Bikeway, Trails, Sidewalks and Spot Improvements by RPC

Regional Planning Commission	Prioritized Bikeway (Centerline Miles)	Prioritized Trails (Centerline Miles)	Prioritized Sidewalks (Centerline Miles)	Prioritized Spot Improvements
Central New Hampshire	7	26	6	0
Lakes	70	0	8	0
Nashua	42	16	0	0
North Country Council	53	6	0	0
Rockingham	16	4	4	11
Southern New Hampshire	16	20	2	3
Southwest New Hampshire	18	1	2	6
Strafford	26	5	0	3
Upper Valley Lake Sunapee	13	1	0	2
Statewide Total	**261**	**79**	**22**	**25**

Data represents roadways owned and maintained by NHDOT, numbered roadways within Urban Compact Area and trails in the network.

Chapter 6: Plan Implementation

This chapter summarizes a variety of considerations and recommendations to support and guide the implementation of this Plan.

In this Chapter:

- **How to Move Projects Forward**
- **Bipartisan Infrastructure Law (BIL)**
- **Maintenance**
- **Performance Measures**
- **Key Action Items**

Elm Street in Manchester, NH

How to Move Projects Forward

Funding for pedestrian and bicycle accommodations (sidewalks and bicycle network improvements), as well as other improvements along New Hampshire's state (and municipal) roadways can be covered by a variety of sources (see the figure below). In New Hampshire, projects are typically funded by the municipality, or by federal funding as part of the Ten-Year Plan process*, Transportation Alternative Program (TAP), or Congestion Mitigation and Air Quality Improvement (CMAQ) grants. The 2021 Bipartisan Infrastructure Law (BIL) offers many additional opportunities. See the summary table later in this chapter.

With the passing of the BIL, USDOT also established a new Special Rule under the Highway Safety Improvement Program (HSIP) for non-motorized vulnerable road user (VRU) safety and continued the two existing special rules for High-Risk Rural Roads (HRRR) and Older Drivers and Pedestrians, without change. The VRU Special Rule is part of a larger focus on non-motorist safety that includes a new requirement for States to complete VRU safety assessments.

Under the BIL, states in which vulnerable road user deaths make up 15 percent or more of total fatalities will now be subject to the new Vulnerable Road User Special Rule, which requires them to spend at least 15 percent of Highway Safety Improvement Program funds on projects specifically focused on those groups. As such, New Hampshire is required to spend 15 percent of HSIP funding in federal fiscal year 2023 for improvements to decrease the risk of fatal and serious injuries for vulnerable road users, i.e., pedestrians and bicyclists. NHDOT plans to continue to program approximately 15 percent of HSIP funding for pedestrian and bicycle improvements per year, in addition to the funding provided by TAP, CMAQ and the Ten-Year Plan projects.

Figure 8. Funding Sources

Although the desired pedestrian and bicycle network improvements are preliminary, they provide a starting point and demonstrate some of the gaps and the needs for pedestrian and bicycle facility improvements throughout the state. The gaps in sidewalk and bikeway networks and needed spot improvements should be further discussed with municipalities and refined as necessary. Many of these improvements can be programmed for construction as part of NHDOT's annual HSIP funding.

* NHDOT transportation projects are developed and prioritized through a complex interactive process known as The Ten-Year Transportation Improvement Plan. This plan is updated every other year with input from the local level, the nine Regional Planning Commissions, numerous public hearings by the Governor's Advisory Commission on Intermodal Transportation and finally, review and approval by the Governor and Legislature

Bipartisan Infrastructure Law (BIL)

Accomplishing the Plan's goals and specific actions will require a significant financial and resource commitment. The 2021 Bipartisan Infrastructure Law (BIL) provides new funding sources and increases to existing programs that prioritize active transportation. Table 9 provides an overview of four new competitive grant programs offered under the BIL directly related to active transportation. In addition to the competitive grant opportunities for active transportation, the BIL also funds and, in some cases, provides new requirements to existing programs applicable to active transportation, including (funds shown are national totals):

- Transportation Alternatives Program (TAP): $7.2 billion over five years (10% of each state's Surface Transportation Block Grant program funds) competitive grant program for projects that promote modes of transportation other than driving. New inclusions being anything eligible under Safe Routes to School Program or targeting vulnerable road user safety.
- Congestion Mitigation and Air Quality (CMAQ) Program: $13.2 billion for projects that support the reduction of transportation greenhouse gas emissions.
- Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Program: $15 billion (up from $4 billion spent from 2009-2020) competitive grant program for projects that improve safety, environmental sustainability, quality of life, economic competitiveness, state of good repair, and connectivity.
- Complete Streets set-aside: 2.5% of each MPO's federal planning funds to produce Complete Streets standards, facilitating planning for Complete Streets project prioritization plans, and developing active transportation plans.
- Safe Routes to School Program: $1 million minimum to states with a formula based on primary and secondary school enrollment numbers. States can leverage core highway formula funds to fund the program.
- Carbon Reduction Formula Program: $6.4 billion over 5 years that will be distributed through MPOs and state with flexibility. Project details unknown at this time but active transportation and trail projects may be funded.
- Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT): $7.3 billion (formula grant portion) for extreme weather resilience and emergency response infrastructure.
- Bridge Formula Program: $26.5 billion to replace, rehabilitate, preserve, protect, and construct highway and off-network bridges.

Table 9. New BIL Funding Programs for Active Transportation

Funding Program	Description and Eligible Recipients	Local Match Requirement
Safe Streets for All (SS4A)	5 Year program at $1 billion per year distributed through an annual competitive grant cycle	20%
Reconnecting Communities	$500M (and up to $1B in future appropriation); competitive grant program for planning or construction	20% for planning activities and 50% for implementation
Healthy Streets	$500M for programs that address urban heat islands, improve air quality, and reduce stormwater runoff. Subject to appropriations and may be available in 2023	Unknown
Active Transportation Infrastructure Investment	$1B over 5 years ($200M/year); Subject to appropriations and may be available in 2023	Unknown

Additional Funding Resources

- Building A Better America: Guidebook to the Bipartisan Infrastructure Law [59]
- Applicant Toolkit For Competitive Funding Programs at USDOT [60]
- FHWA Technical Assistance/Local Support [61]
- USDOT Funding and Financing Opportunities [62]
- Pedestrian and Bicycle Funding Opportunities [63]

Maintenance

Bicyclists and pedestrians depend on a network of bikeways and sidewalks to make their trips. They are also impacted by the condition of the facility. Routine maintenance of pedestrian and bicycle facilities ensures that these facilities are reliable for everyday use. Ongoing upkeep of active transportation facilities ensures reliable conditions, encouraging people to choose active transportation. Lack of maintenance of bicycle and pedestrian facilities can have environmental justice implications, reduce active transportation accessibility and comfort, and increase the risk of hazards along the facility.

Winter Maintenance

People use the transportation network year-round, so snow and ice removal is a critical safety and mobility concern for all users including those that chose not to use or do not have access to a motor vehicle. However, the need for year-round maintenance of walking infrastructure can be a barrier at multiple project stages. At the project planning and design phases, pedestrian facilities are sometimes left out of a project because NHDOT and the local government agency are unable to come to agreement on ongoing maintenance responsibilities. The project design stage is critical for considering how a sidewalk or sidepath will be maintained after it is constructed. For example, sidewalk width impacts whether maintenance equipment will effectively clear a sidewalk after a winter snowstorm. If maintenance decisions are left until after construction, a local agency may find design flaws that limit their ability to effectively maintain a safe and comfortable path in the winter.

Maintenance Recommendations

Having a robust and well-funded annual maintenance program for active transportation facilities provides the following benefits:

- Reduce the likelihood falls and crashes that can result in injury
- Provide clearly defined, year-round facilities
- Encourage year-round facility use and high return on investment
- Prolong useful life of valuable infrastructure investments
- Greater equity for all users including underserved communities and populations

Example of winter roadway conditions along a bike route in Logging Hill Road in Bow, NH.

As such, NHDOT will:

- Clearly communicate to communities the maintenance responsibilities as shown in Table 2 of this document and ensure communities sign a maintenance agreement during the project planning and design stage.
- Review current active transportation maintenance roles, responsibilities, and resources within the state, and evaluate the distribution and maintenance duties between state and municipal forces.
- Educate legislators and other elected officials, as well as the general public, on the benefits and needs of active transportation so that these stakeholders better appreciate the need to fund AT infrastructure maintenance. Additional details can be found in the Policy and Practice Recommendations section of this plan.
- Research active transportation maintenance best practices in similar cold weather regions.
- Support legislation that provides funding for the community maintenance (both equipment and labor) of bicycle and pedestrian facilities.
- Consider contracted maintenance opportunities for active transportation facilities.

However, because maintenance responsibilities for bicycle and pedestrian facilities primarily fall to the municipalities, as described in Chapter 2, the following recommendations should be considered by local communities with support from NHDOT where appropriate:

- Implement maintenance schedules targeting sweeping and removal of debris from shoulder bikeways and other active transportation infrastructure on a recurring basis.
- Plan on-road bicycle facilities and multi-use trails with adequate room to accommodate maintenance vehicles (such as snow-removal) and storage space for snow (particularly in urban areas where snow sport use is less prevalent).
- Use smaller snow-removal vehicles to plow paths and narrower bicycle facilities, e.g., pickup truck-mounted plows or snowblowers.
- Communities with a de-icing program should employ a proactive or anti-icing strategy on well-used paths and on-street bikeways.
- Recessed thermoplastic pavement markings should be considered along key active transportation routes to minimize damage to shoulder and bike lane-striping during winter.
- Develop a prioritization schedule for snow and ice removal of designated on-street facilities used by pedestrians and bicyclists with a focus on segments that facilitate the highest volume of non-motorized users (i.e., routes to and from schools and key connections such as bridges).
- Develop and make publicly available the municipality's active transportation maintenance plan, schedule, etc. to communicate expectations to users of the active transportation network.

Performance Measures

Building upon the vision and goals, the performance measures described below are intended to benchmark the improvement of pedestrian and bicycling safety, access, and overal culture in New Hampshire and help guide future decision making at the statewide level. These performance measures provide measurable indicators to monitor the progress of implementation. There are multiple performance measures associated with each goal, and the benchmarks for successful achievement of each set of performance measures is provided in the table below. NHDOT, with the support of key committees such as CSAC and HSIP, should regularly assess progress on each performance measure, preferably annually.

Table 10. Performance Measures

Goal	Performance Measure	Benchmark/Target
Safety 	Reduction in crashes involving pedestrians and bicyclists that result in fatal or serious injuries, improvement in reliability of crash data collection, reduction in vehicle travel speeds and other risk factors for crashes across the state.	Develop capability to measure the ***rate*** of non-motorized fatalities and serious injuries through more reliable crash and injury data collection, an expanded network of ped/bike volume count locations and purchase of cell-phone/GPS or similar data.
Access 	Develop data to inform LTS analysis on state and local roads in New Hampshire, including reliable data on shoulder width, traffic speed and traffic volume through routine road inventory, and other data sources.	Increase the percent of residents walking to work from 3% to 5% by 2030. Increase the percentage of the NHDOT network that has an LTS score of 1 or 2 from 19% in 2020 to 25% by 2035.
Culture 	Expansion of Complete Streets approach and design guidelines at the state & RPC level. Implementation of driver's education curriculum changes and safety campaigns aimed at both drivers and pedestrians/bicyclists. Increase Bicycle and Walk Friendly Community awards.	Increase the number of Bike Friendly Community designations from 6 to 10 by 2030. Require Complete Streets training for key NHDOT staff (including Project Managers and other roadway engineering designers).

Key Action Items

The following action items are intended to guide NHDOT towards implementation of the New Hampshire Pedestrian & Bicycle Plan. The table below highlights the action steps, connection to plan goals, and timeline for implementation.

- *Short-term (one to three years)*
- *Mid-term (three to five years)*
- *Long-term (five plus years)*

Table 11. Key Action Items

Action Step	Goal to Address	Timeline	Responsible Party
Updated staff training at NHDOT on current best practices for pedestrian and bicycle safety design from AASHTO and NACTO, as well as training on application of Complete Streets approach (in progress).	Culture	Short-term (on-going)	NHDOT
Maintain interactive webmap that highlights key existing condition findings from the Plan. Specifically, the bicycle level of traffic stress (LTS) network and the desired network improvements.	Access, Safety, Culture	Short-term (on-going)	NHDOT with support of RPCs
Data Acquisition for shoulder width.	Access, Safety	Short-term	NHDOT
Collaborate with stakeholders to prioritize and implement key policy, program, and general practice recommendations.	Culture	Mid-term	NHDOT
Develop bicycle, pedestrian, and Complete Streets design guidance that NHDOT and its partners can use that are responsive to various land use contexts and the unique character of New Hampshire.	Access, Culture	Mid-term (on-going)	NHDOT
Conduct a systematic safety audit of bicycle and pedestrian crashes to understand trends and identify crash risks.	Safety	Mid-term	NHDOT
Supplement active transportation design guidelines to better reflect current best practices for pedestrian and bicycle safety.	Safety, Culture	Mid-term	NHDOT with support of CSAC

Action Step	Goal to Address	Timeline	Responsible Party
Develop more specific performance targets for each of the three plan goals and evaluate progress. Consider releasing an annual progress report on NHDOT's website to inform partners and the general public about accomplishments and challenges.	Access, Safety, Culture	Long-term	NHDOT with support of CSAC
Data Acquisition for traffic volume and non-motorized user volume to allow ongoing LTS analysis and calculation of non-motorized crash rates.	Access, Safety	Long-term	NHDOT and RPCs
Pursue new annual programmatic funding for pedestrian, bicycle (and rail trail) in the Ten-Year Plan in addition to existing sources, such as CMAQ, TAP, and HSIP.	Access, Safety	Long-term	NHDOT
Update and provide ongoing officer training (at academy and in-service) on data collection at scene of non-motorized crashes and education and enforcement of traffic laws related to pedestrian and bicycle safety.	Safety, Culture	Long-term	NHDOS with support of NHDOT

Endnotes & Web Addresses

Chapter 1: Introduction

[1] *https://www.dot.nh.gov/sites/g/files/ehbemt811/files/inline-documents/2022-2026-43246-nh-hsip-08042022.pdf*

[2] *The New Hampshire Rail Trails Plan is a plan mandated by the New Hampshire legislature to guide the preservation and investment in New Hampshire's state-owned rail corridors as trails that can be used for a variety of activities, including walking and biking. https://mm.nh.gov/files/uploads/dot/remote-docs/2022-rail-trails-plan-web.pdf*

[3] *https://rosap.ntl.bts.gov/view/dot/50506*

[4] *Jacobsen, P.L. (2003) "Safety in Numbers: More Walkers and Bicyclists, Safer Walking and Biking." Injury Prevention Journal #9*

[5] *Per AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities manual: Sidewalks should connect to street systems and destinations in a safe and convenient manner. Where sidewalks are provided on only one side of a roadway, the overall connectivity of the sidewalk is weakened, as well as pedestrian safety and accessibility. Sidewalks provide on only one side of the street often require pedestrians to cross streets unnecessarily to meet their travel needs. As a result, the level of exposure of pedestrians to potential conflicts is increased. Therefore, sidewalks on only one side of the street are not generally recommended. However, a sidewalk on one side of the street may be appropriate where only that side of the street is developed. A sidewalk on one side of the street may also be adequate for some local streets on an interim basis, especially when this improves a condition where there were no sidewalks previously.*

[6] *Campbell, B et al (2004), "A Review of Pedestrian Safety Research in the U.S. and Abroad." Federal Highway Administration Publication #FHWA-RD-03-042*

[7] *Clifton, Kelley J, Morrisey, Sara, and Ritter, Chloe (2012), "Business Cycles: Catering to the Bicycle Market." Transportation Research Board's TR News, Number 280, May-June 2012*

[8] Because many visitors made multiple comments, it is not possible to determine how many individuals provided the 859 suggestions.

Chapter 2: Existing Conditions

[9] *https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/fhwahep17024_lg.pdf*

[10] *https://bikeleague.org/sites/default/files/BFS_Report_Card_2022_New_Hampshire.pdf*

[11] *https://bikeleague.org/content/model-vulnerable-road-user-law#:~:text=A%20Vulnerable%20Road%20User%20Law%20can%20fill%20legal%20gaps%20between,which%20have%20severe%20societal%20costs.*

[12] Center for Infrastructure Equity. Transportation Equity. PolicyLink. 2016. http://www.policylink.org/focus-areas/infrastructure-equity/transportation-equity.
[13] *https://www.nheconomy.com/getmedia/0205c62d-9c30-4b00-9c9e-d81d8f17b8b3/NH-Population-Projections-2020-2050-Final-Report-092022.pdf*

[14] *https://iod.unh.edu/facts-and-figures/*

[15] *Dannenberg A, Frumkin H, Jackson R. Making Healthy Places. 1st ed. Washington D.C.: Island Press; 2011.*
[16] *Rubin V. Sustainable Communities Series: Regional Planning for Health Equity. PolicyLink. 2015.*
Chapter 3: Policy & Practice Recommendations
[17] *Mckenzie B. Modes Less Traveled—Bicycling and Walking to Work in the United States: 2008–2012. Am Community Surv Reports. 2014.*
Chapter 4: Complete Streets
[18] *https://smartgrowthamerica.org/what-are-complete-streets/*

[19] *https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-03/Complete%20Streets%20Report%20to%20Congress.pdf*

[20] *https://smartgrowthamerica.org/resources/elements-complete-streets-policy*

[21] *https://www.completestreetsnc.org/wp-content/themes/CompleteStreets_Custom/pdfs/NCDOT-Complete-Streets-Planning-Design-Guidelines-Appendices.pdf*

Complete Streets Policies by State:
[22] California: *www.leginfo.ca.gov/pub/07-08/bill/asm/ab_1351-1400/ab_1358_bill_20080930_chaptered.pdf*

[23] Connecticut: *https://portal.ct.gov/-/media/DOT/PLNG_PLANS/BikePedPlan/CSExO31signedpdf.pdf?la=en&hash=8C05661AA105AEE9850D0AD987472162*

[24] Colorado: *https://www.codot.gov/programs/bikeped/documents/1602-0-policy-bike-pedestrian*

[25] Delaware:
https://deldot.gov/Publications/manuals/complete_streets/pdfs/o06_complete_streets_policy.pdf

[26] Florida: *https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/completestreets/000-625-017-a.pdf?sfvrsn=5f76a980_2*

[27] Georgia: *https://www.dot.ga.gov/PartnerSmart/DesignManuals/DesignPolicy/GDOT-DPM.pdf*

[28] Hawaii: *https://www.capitol.hawaii.gov/slh/Years/SLH2009/SLH2009_Act54.pdf*

[29] Iowa: *https://iowadot.gov/iowainmotion/files/Complete-Streets-Policy.pdf*

[30] Illinois: *https://www.ilga.gov/legislation/publicacts/95/PDF/095-0665.pdf*

[31] Indiana: *https://www.in.gov/indot/div/pubs/AM_CompleteStreetsGuideline.pdf*

[32] Kentucky: *https://transportation.ky.gov/BikeWalk/Documents/KYTC%20Pedestrian%20and%20Bicycle%20Travel%20Policy%20%202002.pdf*

[33] Louisiana: *http://wwwsp.dotd.la.gov/Inside_LaDOTD/Divisions/Multimodal/Highway_Safety/Complete_Streets/Misc%20Documents/cs-la-dotpolicy.pdf*

[34] Massachusetts: *https://malegislature.gov/Laws/GeneralLaws/PartI/TitleXIV/Chapter90I*

[35] Maryland: *https://roads.maryland.gov/OPPEN/SHA_Complete_Street_Policy.pdf*

[36] Maine: *https://www.maine.gov/mdot/completestreets/docs/MaineDOTCompleteStreetsPolicyFinal.pdf*

[37] Michigan: *https://www.michigan.gov/mdot/-/media/Project/Websites/MDOT/About-Us/Commissions/Complete-Streets/Public-Act-135-of-2010.pdf?rev=b177017958ad422b8571c373516186e8&hash=F918C56B44D6FA85C1BA11CECFD02ADE#:~:text=(a)%20Provide%20education%20and%20advice,coordination%20of%20complete%20streets%20policies*

[38] Minnesota: *https://dot.state.mn.us/policy/operations/oe004.html*

[39] Missouri: *https://house.mo.gov/billtracking/bills111/hlrbillspdf/1269L.02C.pdf*

[40] North Carolina: *https://connect.ncdot.gov/projects/BikePed/Documents/CS%20Policy%208.28.19.pdf*

[41] New Jersey: *https://www.state.nj.us/transportation/eng/completestreets/pdf/completestreetspolicy.pdf*

[42] New Mexico: *https://www.nmlegis.gov/Sessions/17%20Regular/memorials/senate/SM035.pdf*

[43] Nevada: *https://www.dot.nv.gov/home/showpublisheddocument/8594/636367663457970000*

[44] New York: *https://www.nysenate.gov/legislation/bills/2011/s5411/amendment/a*

[45] Oregon: *https://oregon.public.law/statutes/ors_366.514*

[46] Puerto Rico: *https://casetext.com/statute/laws-of-puerto-rico/title-nine-highways-and-traffic/chapter-6-complete-streets*

[47] Rhode Island: *http://webserver.rilin.state.ri.us/Statutes/TITLE24/24-16/24-16-2.HTM*

[48] South Carolina: *http://info2.scdot.org/SCDOTPress/PublishingImages/DD%2028%20Complete%20Streets.pdf*

[49] Tennessee: *https://www.tn.gov/content/dam/tn/tdot/public-trans/TDOTMultimodalAccessPolicy.pdf*

[50] Texas: *https://ftp.txdot.gov/pub/txdot-info/sat/specinfo/bike-pedestrian-memo.pdf*

[51] Utah: *https://web.mountainland.org/img/minutes/TAC/2014/2014_01_06/UDOT%20Active%20Transportation%20Policy.pdf*

[52] Virginia: *https://www.virginiadot.org/programs/resources/bike_ped_policy.pdf*

[53] Vermont: *https://vtrans.vermont.gov/sites/aot/files/highway/documents/publications/Complete%20Streets%20Guidance%20Document.pdf*

[54] Washington: *http://leap.leg.wa.gov/leap/Budget/Detail/2022/ctH-2991.3.pdf*

[55] West Virginia: *https://www.wvlegislature.gov/Bill_Status/bills_text.cfm?billdoc=SB158%20SUB2%20ENR.htm&yr=2013&sesstype=RS&i=158*

[56] *https://files.cityofportsmouth.com/files/dpw/PortsmouthCompleteStreetsGuideJuly2017.pdf*

[57] *https://www.completestreetsnc.org/wp-content/themes/CompleteStreets_Custom/pdfs/NCDOT-Complete-Streets-Planning-Design-Guidelines-Appendices.pdf*

[58] https://www.maine.gov/mdot/completestreets/docs/MaineDOTCompleteStreetsPolicyFinal.pdf

Chapter 6: Plan Implementation

[59] *https://www.whitehouse.gov/build/guidebook/*

[60] *https://www.transportation.gov/rural/grants/toolkit*

[61] *https://www.fhwa.dot.gov/bipartisan-infrastructure-law/technical_support.cfm*

[62] *https://www.transportation.gov/rural/funding-opportunities*

[63] *https://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/funding_opportunities.pdf*

Appendix 1: Detailed Public Engagement Feedback

Project Advisory Committee

To help guide the NHDOT Pedestrian and Bicycle Transportation Plan effort, a Project Advisory Committee (PAC) was organized by the Department. It included the current members of the Complete Streets Advisory Committee (CSAC), plus a handful of additional members who were included to provide a more complete perspective on pedestrian and bicycling issues, especially how they interface with economic development.

The PAC provided input on the draft work products developed by the consultant team, including the early 2019 existing conditions analysis, network recommendations, and the development of project goals and objectives. Additionally, committee members helped to promote the public meetings and outreach events, both of which induced significant public input that helped to inform the Alta team's planning efforts.

RPC Technical Advisory Committee meetings

In February and March 2019, the consultant team met with each of the state's nine Regional Planning Commission (RPC) Technical Advisory Committees (TAC). At the meetings, the team presented a summary of the project schedule, scope of work and deliverables, and initiated discussion about pedestrian and bicycle network gaps throughout each respective region. The locations for the nine meetings included:

- Southwest RPC TAC in Keene
- North Country Council TAC in Lincoln
- Southern NHPC TAC in Manchester
- Rockingham RPC TAC in Exeter
- Strafford RPC TAC in Rochester
- Central NHRPC TAC in Bow
- Upper Valley Lake Sunapee RPC TAC in Lebanon
- Nashua RPC TAC in Merrimack

Online Input

Project Website

The project website (http://nhpedbikeplan.com) designed to explain the study and promote the plan went live in early February 2019. The website also featured solicited input via an online survey and online public input map tool that was closed to the public at midnight on October 15, 2019. Links to the survey, online input map, and other documents including PowerPoint presentations from the public meetings and notes from the PAC meetings and public flyers were made available on the website as well. The web site also provided an opportunity for visitors to request being placed on the project email list and/or to leave a comment. Through this portal, 93 people left their name and email address only and 79 people also included comments.

Screenshot of the Interactive Map tool on the websites landing page

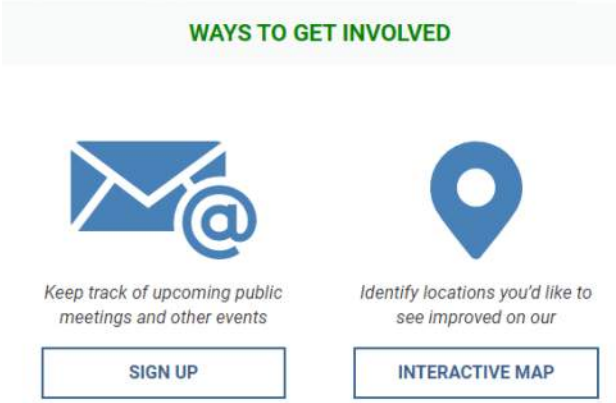
The project web site was supplemented by social media accounts with Facebook (54 followers), Twitter (18 followers) and Instagram (8 followers). Although the project team provided a modest stream of postings to each platform, social media activity, such as "likes" and retweets, was relatively minimal. Despite the relatively low number of followers to each of the accounts, over 50 people left their names and email address to indicate their interest in being kept in the loop during the process.

Online Survey

The online survey opened in early February 2019, and included 17 questions. By the time the survey was closed to public comment on October 15, 1095 individual responses had been received.

The survey featured a mix of questions related to barriers to walking and bicycling, the primary purposes for, and frequency of, walk and bike trips, confidence level when riding a bicycle, factors that prevent more walk and bike trips, perceived effectiveness of a variety of infrastructure and program improvements, and open-ended responses seeking info on specific roadways that need improved pedestrian and bicycle facilities. The 17 questions in the survey included:

1. What is the five-digit zip code of your current residence?
2. In what type of community do you live?
3. What is your age?
4. What is your gender?
5. If you drive a car regularly for most or all of your trips, what barriers prevent you from walking or bicycling more frequently? (top 3)
6. Which of the following initiatives would encourage you to walk or bike more frequently for transportation? (top 3)
7. What are the two primary reasons you walk?
8. What are the two primary reasons you ride a bike?
9. Have you bicycled in New Hampshire in the past year?
10. If you bicycled in the past year, how many times do you ride your bike in a typical spring/summer/fall week? (a trip is one-way, so a round trip counts as 2 bike rides)
11. If you have not bicycled in New Hampshire in the last year, which factors MOST prevented you from doing so?
12. How confident do you feel when riding a bicycle?
13. How effective do you believe each of the following improvements would be to increase the number of trips that residents of New Hampshire make by walking or bicycling?
14. Of the improvements in Question 13, which three would be the most effective?
15. What do you think would MOST improve the walking and bicycling experience for young children? (top 3)
16. Please enter your top 3 state roads in which pedestrian and bicycle facilities are needed to improve accessibility and safety for pedestrians and bicyclists.
17. Would you like to be informed of the results of this survey and be given notice of public meetings for the New Hampshire Statewide Pedestrian and Bicycle Transportation Plan? If yes, please provide your email. (**126 participants submitted their name and email address.**)



Additional ways to get involved included signing up for emailed updates and a link to the interactive map

A summary of the 1,095 responses received are shown below;

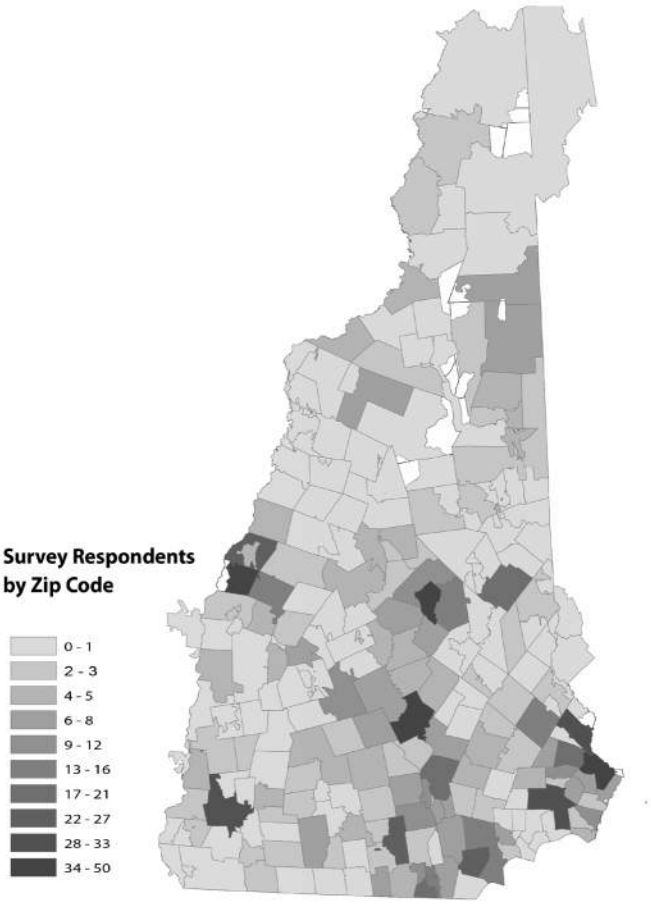


Figure 1. Question 1 Reponses

The largest number of respondents reported living in Zip codes, 03766 (Lebanon), 03301 (Concord), and 03246 (Laconia) respectively

Question 1: "*What is the five-digit zip code of your current residence?"* The survey included least one response from 209 out of the 248 Zip codes in New Hampshire. Twenty-five Zip codes had more than ten responses each, and there were 73 Zip codes with one response each.

Question 2: "*In what type of community do you live*?" Respondents indicated the following categories:

- Other: 2.4%.
- Rural: 20.3%
- Small town / village: 38.2%
- Suburban: 23.3%
- Urban: 16.0%

Question 3: "*What is your age?"* The largest age category was the 50 – 69 years of age, indicating high interest among the middle-aged and folks heading into retirement, where interest in pedestrian and bicycle facilities peaks for some. The respondents indicated their age within following categories:

- <18: 0.3%
- 18-29: 8.0%
- 30-49: 33.3%
- 50-69: 47.8%
- >70: 10.6%

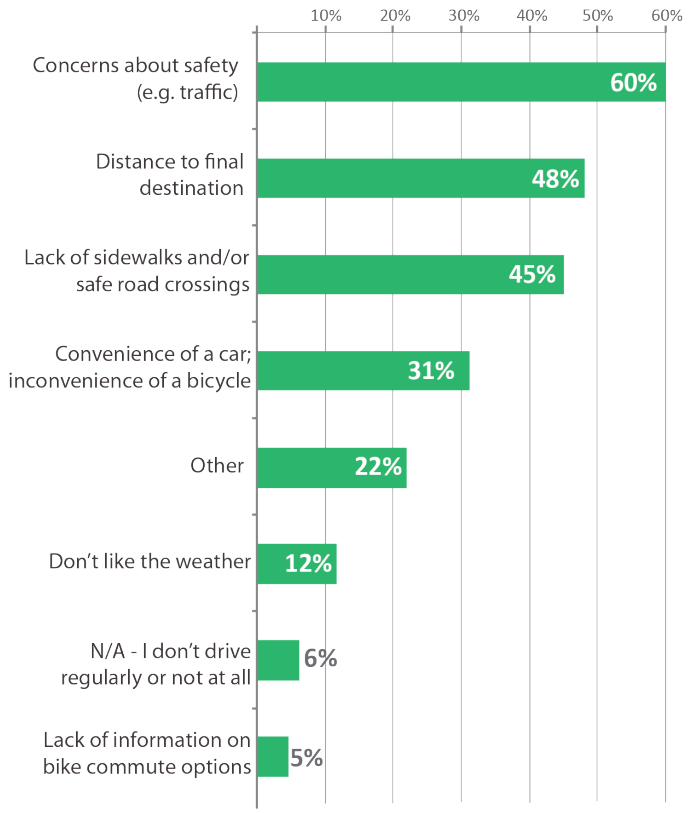


Figure 2. Question 5 Responses

The three most popular responses indicate that concerns about safety when riding in or around motor vehicle traffic, the distance to the final destination, and the lack of sidewalks or crossings are the primary barriers to walking or bicycling more frequently in New Hampshire.

Question 4: "*What is your gender?"* Respondents were nearly evenly split along gender lines, with 52.1 identifying as Male, 45.5% identifying as Female. 2.4% selected "Other / Prefer Not to Answer".

Question 5: "*If you drive a car regularly for most or all of your trips, what barriers prevent you from walking or bicycling more frequently?"* (Choose top 3). See Figure 2 for responses.

Question 6: "*Which of the following initiatives would encourage you to walk or bike more frequently for transportation?"* (Choose top 3). 70% of all respondents chose "More bike lanes and wider shoulders." 60% of all respondents chose "More rail trails and multi-use paths." And 39% of all respondents chose "Better connected sidewalk network with safer crossings."

Question 7 and 8: "*What are the two primary reasons you walk? What are the two primary reasons you ride a bike?"* The majority of respondents indicated that they choose to walk and to bicycle because it is healthy form of exercise and because it is good for the environment. (See Figure 3.)

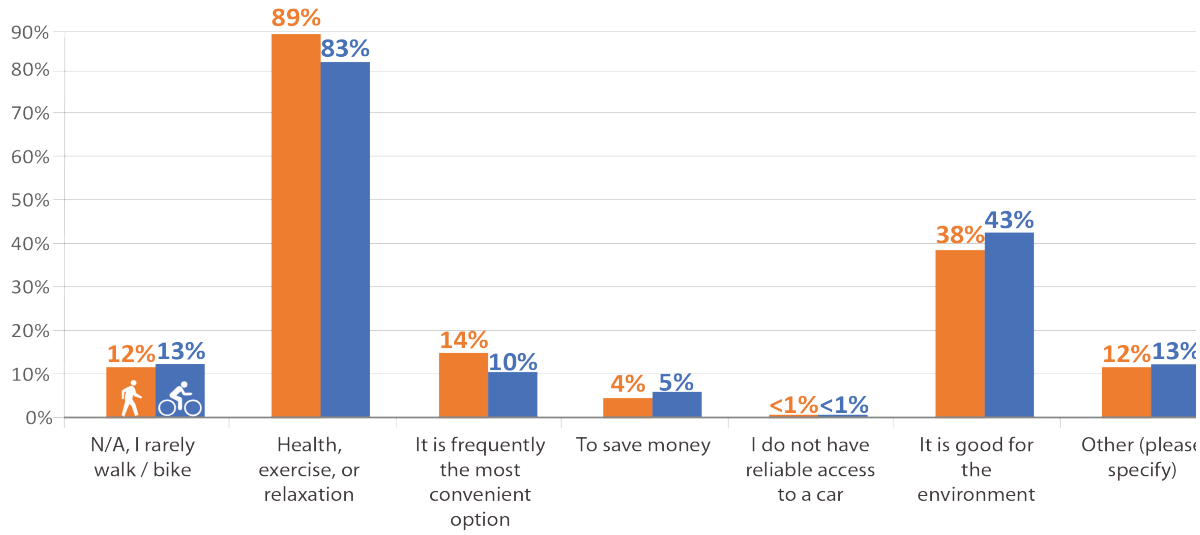


Figure 3. Question 7 & 8 Responses

Question 9: *"Have you bicycled in New Hampshire in the past year?"*
Yes: 83%
No: 17%

Question 10: *"If you bicycled in the past year, how many times do you ride your bike in a typical spring/summer/fall week? (a trip is one-way, so a round trip counts as 2 bike rides)"*

- Zero times per week: 4%
- 1 to 2 times per week: 24%
- to 5 times per week: 29%
- 5 to 10 times per week: 19%
- More than 10 times per week: 24%

Question 11: *"If you have not bicycled in New Hampshire in the last year, which factors MOST prevented you from doing so?"* Respondents were offered 11 choices to rank. As seen in Figure 4, the top three choices were:

- Bicycle lanes and trails are too few and not interconnected: 55%
- I don't feel safe riding a bicycle in traffic: 47%
- Road surfaces are poor: 31%

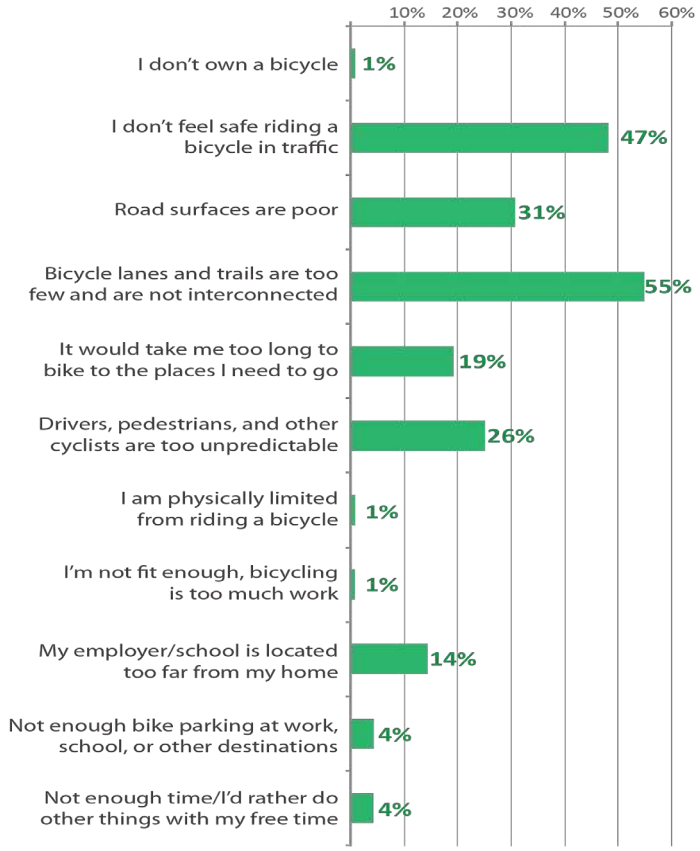


Figure 4. Question 11 Responses

Question 12: *"How confident do you feel when riding a bicycle?"*

- I do not or cannot ride a bike and have no plans to start riding: 0.6%
- Modestly confident: I only feel safe on separated trails/paths with few traffic crossings: 18.3%
- Quite confident: I prefer separated paths, but will ride on roads where space is available and traffic is manageable: 46.4%
- Very confident: I am comfortable riding with traffic in most situations: 34.7%

Question 13 & 14: "How effective do you believe each of the following improvements would be to increase the number of trips that residents of New Hampshire make by walking or bicycling? Of the improvements in Question 13, which three would be the most effective?"

- Respondents indicated whether they felt each of the 18 individual projects or programs was "Very Effective", "Effective", "Neutral", "Ineffective", or "Very Ineffective." (See *Figure 5* below.)

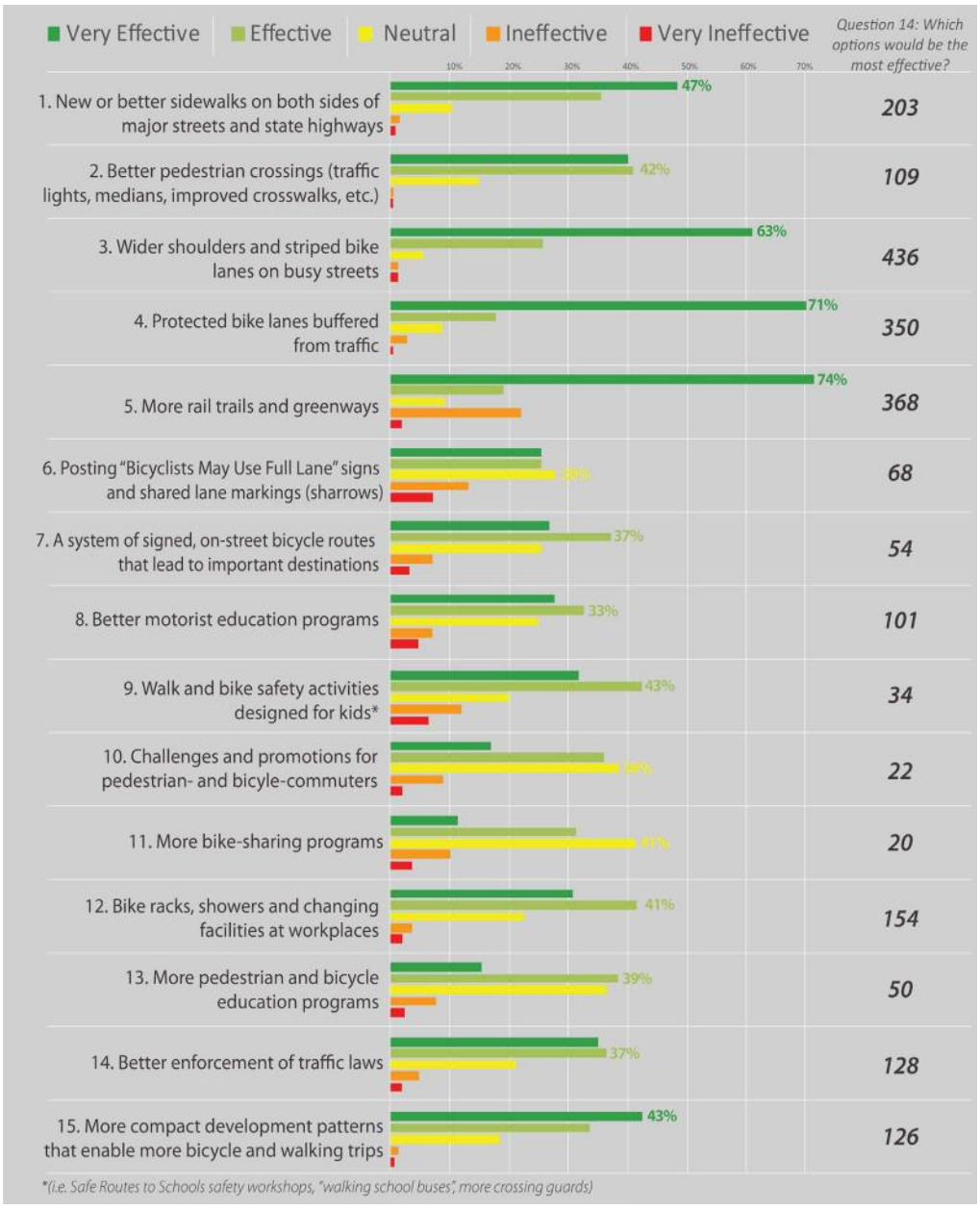


Figure 5. Question 13 & 14 Responses

Question 15: *"What do you think would MOST improve the walking and bicycling experience for young children?" (Choose top 3)*

- New or better sidewalks near schools and parks: 60%
- Traffic calming treatments near schools such as speed humps: 30.9%
- New or better crossing treatment: 28.5%
- Walking school buses: 25.9%
- Reduced automobile congestion at school during drop off and pick up periods: 23.3%
- Additional crossing guards: 7.1%
- Better police enforcement near schools: 13.8%
- Better safety training at schools: 25.9%
- Secure bike parking at schools: 11.1%
- Route maps provided to children of their own neighborhood: 8.1%

Question 16: *"Please enter your top 3 state roads in which pedestrian and bicycle facilities are needed to improve accessibility and safety for pedestrians and bicyclists."* Respondents were able to fill in a blank text box with their answer. There were 185 individual responses. Any roadway mentioned only once is not included in Figure 6 below. Respondents indicated that the roads most in need of improve accessibility and safety for pedestrians and bicyclists include US 3, NH 28, US 4, NH 101, and NH 108.

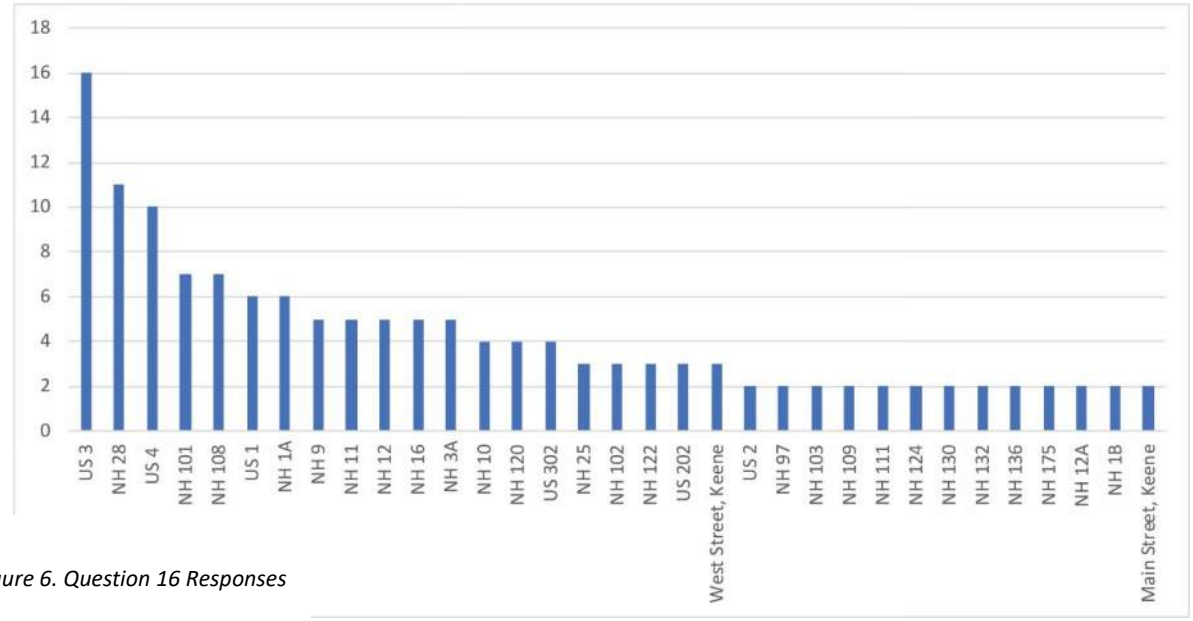


Figure 6. Question 16 Responses

Online Public Input Map

The interactive online public input map was developed at the same time as the online survey, both placed on the project web site. There were a variety of ways that users were able to add input to the map; users received prompts and could place lines or marker points on the map to identify:

1. Where do you currently walk or bike in New Hampshire?
2. What destinations would you like to access by walking or biking in New Hampshire?
3. Which routes work well for walking and biking vs. routes that need improvement?
4. What are barriers to walking or biking (such as a busy intersection)?

Map users also had the ability to add a comment to the point or marker that they placed to indicate additional issues. After being closed for public comment at midnight on October 15th 2019, the input map tool featured:

- 859 map suggestions based on prompts
    - 416 lines markers (per prompt #1 and #3 above)
    - 443 markers (per prompt #2 and #4 above)
- 916 comments/votes on the 859 suggestions stated above
    - 834 "Likes"
    - 82 "Dislikes"
- 289 misc. comments

Many of the comments related to general corridor-wide improvements needed, while others were more focused on specific neighborhoods, streets, or intersections throughout the state. A selection of interesting comments includes:

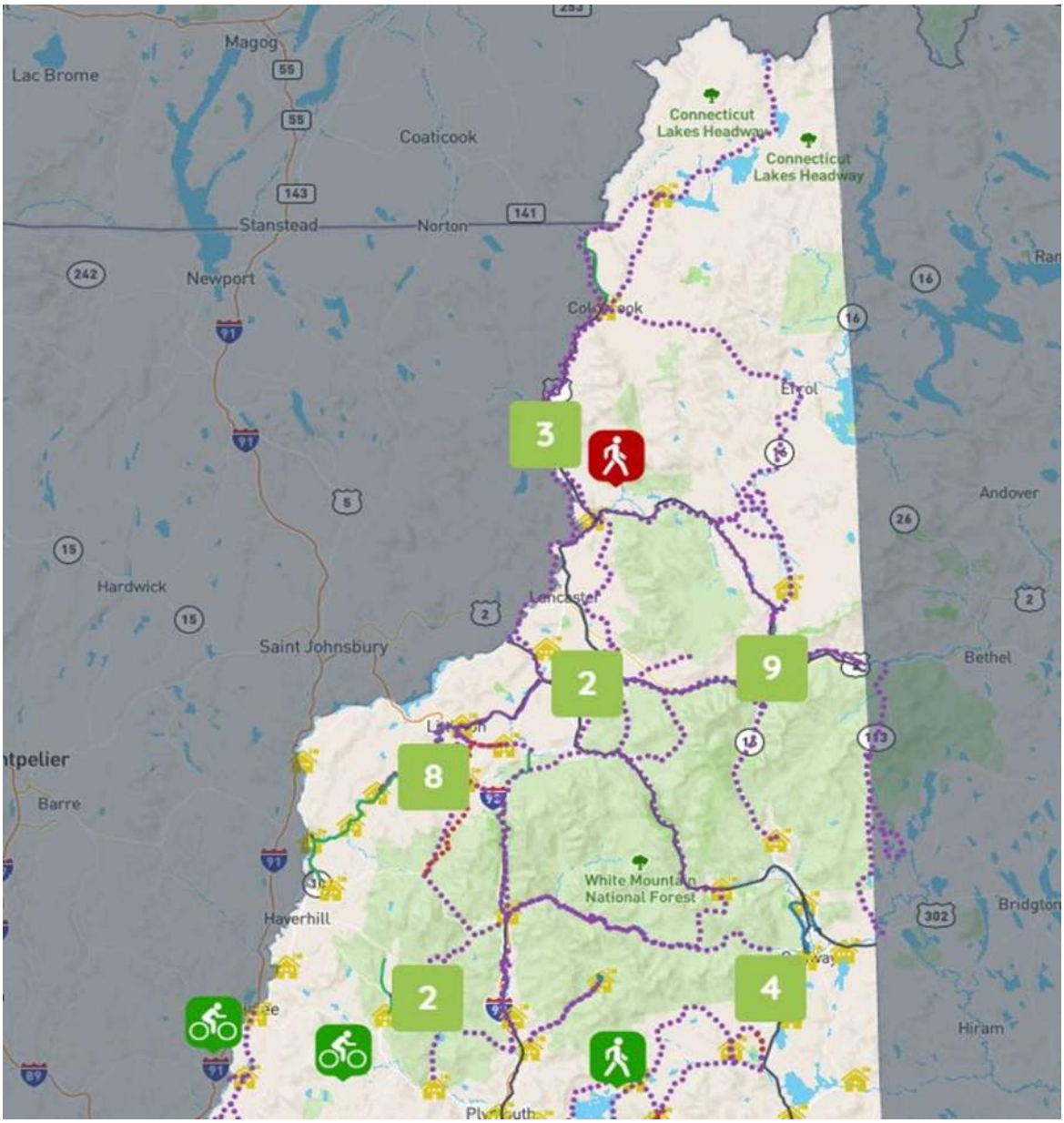
- **Roadway Maintenance**: "Despite being a state-designated bike route, the paved shoulder to the right of the white fog line along Route 120 north and south is frequently fewer than six inches wide. Considering the high speed of vehicles, and portions where posted limits are between 40 and 50 mph, this entire corridor puts bicycle commuters at high risk, meaning only the most experienced riders are likely to take a chance at riding on this route identified (*by someone else*) as suitable for biking." *(Marker left in Plainfield, just south of Lebanon)*
- **Connectivity:** NH 120 is a tremendously important route. It connects Lebanon to Hanover via the region's two biggest employers (Dartmouth College and DHMC). Parts of it are good (Mt. Support off-road path), parts of it are lacking (route on hospital property, last 1/2 mile before downtown Hanover). It could release significant latent demand if it's improved."
- **Difficult Bike Crossing**: "It's a challenge here riding north on Route 108 to merge across high-speed traffic to continue north on Route 108" *(Market left on Route 33 at Route 108 in Stratham. Most "liked" comment in this category.)*
- **Difficult Walk Crossing**: "The Miracle Mile (Route 4) is a busy street with a three-lane cross section. It has bus stops, a large thrift store, the closest grocery store to downtown Lebanon, and is very difficult to cross. The city applied for funding for a TAP grant but was unsuccessful. A safe crossing and sidewalks are really needed here." (*Most "liked" comment in this category.)*
- **Favorite Bike Destination:** "There are many Exeter students that attend Cooperative Middle School and cannot walk or bike to school due to the Guinea Road bridge over Route 101. The bridge has no sidewalk

nor are there sidewalks to the school entry. Providing a sidewalk/bike lane on the existing bridge or better yet a pedestrian bridge over Route 101 would open a route to Cooperative Middle School for hundreds of Exeter students and parents."

- **Favorite Bike Route**: "Daily cycle commute to work. Section from Hanover to West Lebanon (Meadow Brook area) has a very narrow shoulder - measured at 2-20 inches (varies a bit over the stretch). This is a common cycling route as any other option to get between these places is at least a mile longer. Additionally, it is heavily traveled by cars. Leads to unsafe cycling conditions, and also annoyed drivers who have a hard time passing cyclists on this stretch."
- **Favorite Walk Destination:** "Please add to the WOW trail. Having this trail go from Belmont to Weirs Beach and to potentially Meredith. What a great asset to our community." *(most liked comment in this category.)*
- **Favorite Walk Route**: "No sidewalk for 90% of this route. I often walk with stroller and don't feel safe from cars that drive fast." *(Bridge Street, Manchester)*
- **Needs Bikeway:** "The route from downtown Dover to Kittery/Eliot via NH-4 and NH-101 is the only practical route for cyclists heading East (or take NH-4 all the way to S. Berwick, adding a big climb and several miles). No shoulder, no traffic enforcement, high vehicle traffic and speeding, blind corners and hills, no bike signage despite proximity to ECG/Eastern Trail/US Bike Route 1. Needs paved shoulders (2 foot minimum, maintained) or Bikes May Use Full Lane - Change Lanes to Pass signage. Cooperate with Maine DOT."
- **Needs Walkway**: "This section of Route 4 is designed like a highway and does not match with the adjacent sections. It is very intimidating for peds and bikes given the fast ramps to the highway. When it is eventually rebuilt it should be narrowed and bikes lanes and sidewalks added, and the ramp geometry changed to slow down traffic." (*Marker placed in West Lebanon*)
- **Misc.:** "The Route 4/Madbury Road intersection is dangerous. A friend of mine was badly hit at the intersection while she was proceeding straight on Madbury and a car turned into her. I frequently bike or jog across the intersection, and it is scary, because (a) Madbury Road south of the intersection is narrow and lacks a sidewalk north of Hampshire Ave, (b) there is no way for a pedestrian to change the Route 4 light, and (c) cars travel through the intersection in all directions very fast." *(Marker placed in Durham)*
- **Walk maintenance issue**: "This gap in the roadway network isolates the elementary and high schools from the downtown. I would love to see Hanover Street reconstructed as a two-lane roadway with nice sidewalks to connect the school and town without going onto NH-120. If done well, this could be an attractive connection to the schools for all users. Trimming vegetation and maintaining the existing ped bridge would also be welcomed."

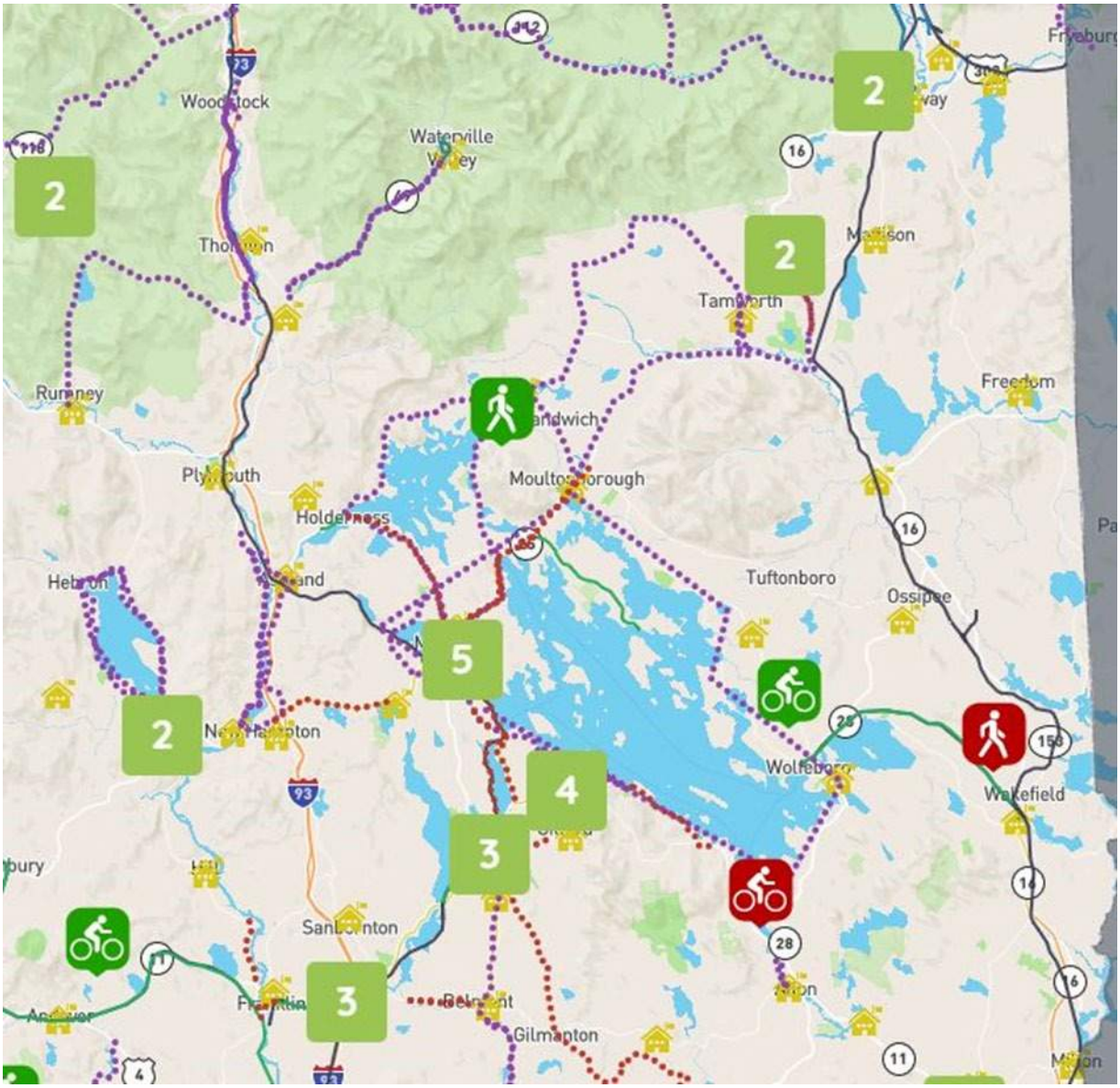
The series of images on the following pages present snapshots, or "screen grabs," from the online public input map that roughly match the various RPC regions. Purple dashed lines indicate routes that work well for walking and biking and the red dashed lines are routes that need improvement. The numbered green boxes represent key destinations and the red bicycle and pedestrian boxes are barriers to access.

Public Input Map – North Country



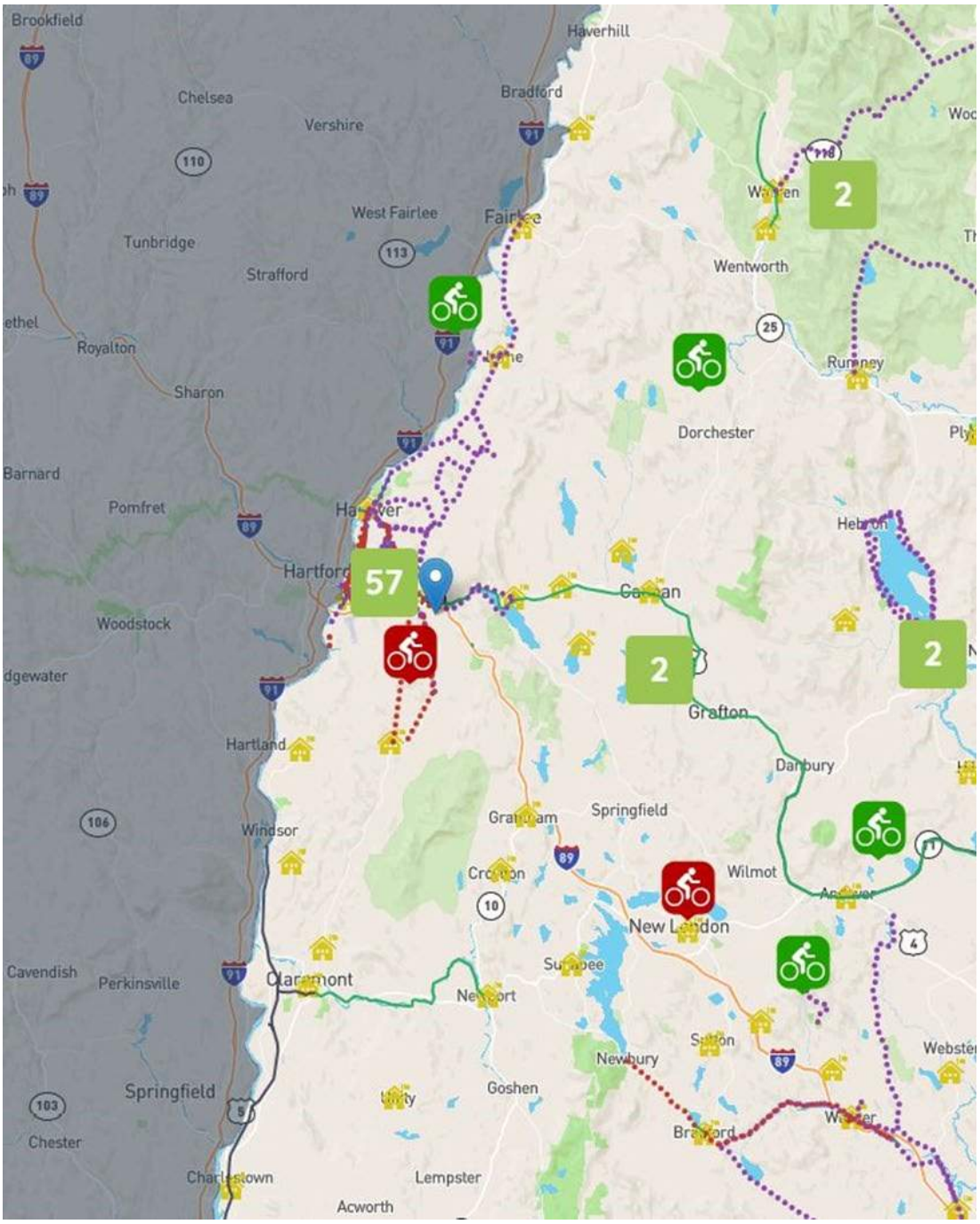
Online public input map users added a variety of desirable pedestrian and bicycle routes to the North Country area.

Public Input Map – Lakes Region



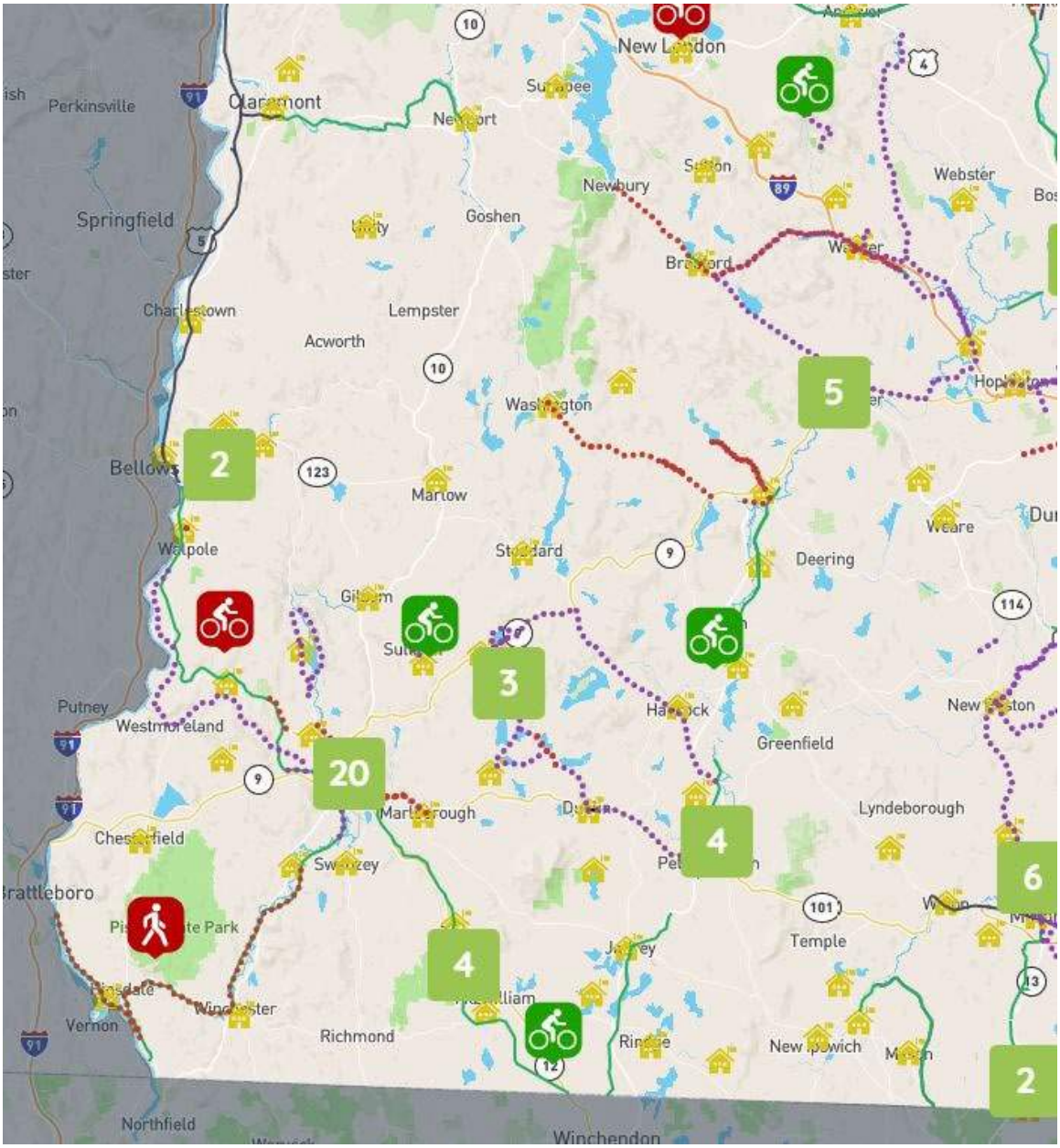
Online public map users added a handful of barriers to walking and bicycling in the region, as well as comments about particular intersections or corridors that need improvement. The Lakes Region was the region with the fewest online public input map comments.

Public Input Map – Hanover-Sunapee Region



Online public map users added dozens of comments in the Hanover area, with fewer comments and map marker points added in the surrounding towns.

Public Input Map - Monadnock Region

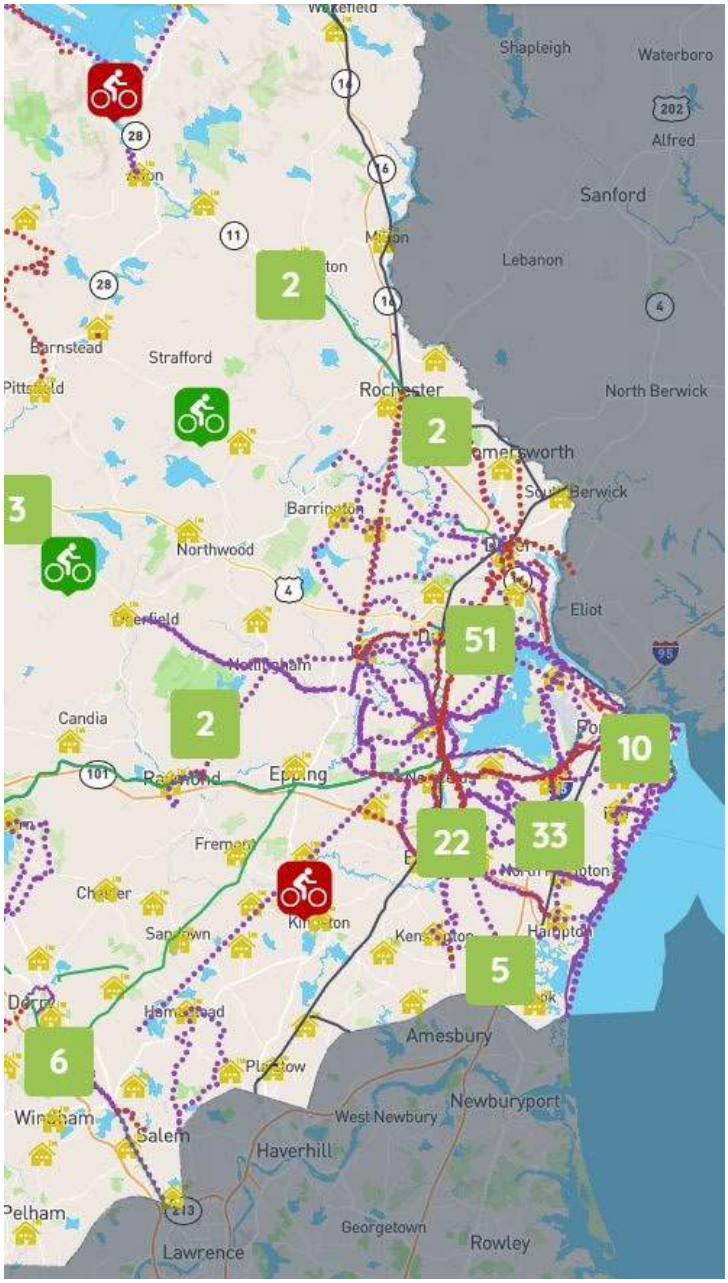


Public input map users indicated many marker point locations with comments related to recreational destinations, connections between rail trails and hiking trails, and on-road improvements desired.

Public Input Map – Merrimack Valley

Public input map users added more than 100 comments in the greater Merrimack Valley Area, ranging from sidewalks on local residential and collector streets to better bicycle access to Merrimack River recreation destinations.

Public Input Map – Seacoast Region



Public input map users in the Strafford region included many miles or desirable route lines, routes that are difficult for walking or bicycling, and more specific comments like sidewalk and intersection crossing needs.

Community Meetings and Events

Throughout the month of September and the first half of October 2019, the planning team engaged the general public in two different formats:

- Evening public meetings were held in five communities: Keene, Lebanon, Manchester, Gilford and Portsmouth. A sixth meeting was held by the UVLS RPC in Lebanon using materials created by, but without assistance from, the Alta team (aka “meeting in a box”)
- Outreach events were held at five farmers markets including Dover, Nashua, Littleton, Concord and Exeter

At all events, participants were asked to answer two key questions derived from the online survey. One related to the primary challenges to walking and bicycling in New Hampshire, and the other question related to the project and/or program improvements that would encourage participants to walk and bicycle more frequently. Participants were also asked to provide the planning team their goals for a pedestrian and bicycle plan for New Hampshire. In most cases, goals were written onto post-it notes and placed on a board for other meeting/event attendees to see. Maps of each respective New Hampshire region was also made available to collect participants’ ideas and comments related to good and bad routes for walking and bicycling, and ideas for where improvements could be made.

Large crowds at the project information table (at center) at the Nashua Farmers Market.

Feedback received from the public was based on similar activities and questions for all events, as described above. The primary distinction between the evening public meetings and the farmer’s market events was that the former included a 25–30-minute slide presentation that summarized the planning process to-date, outlined the mapping/analysis work completed so far, and highlighted next steps in the planning process. A general Q/A period followed the slide presentation and meeting attendees then assembled into small groups of 10-15 in order to provide map comments. Before the meetings were adjourned, a brief summary of the discussion items at each break-out group was made by the facilitator from the Alta team or a member of the local RPC staff.

Outreach Event Dates and Locations

The table below indicates the date of each event, the regional planning commission location served, and the event location.

DATE (2019)	RPC	LOCATION	ATTENDEES
September 8th	Strafford Region Planning Commission	Dover Farmers Market	~85
September 15th	Nashua Region Planning Commission	Nashua Farmers Market	~285
September 17th	Southwest Region Planning Commission	Keene Public Library	20
September 18th	Upper Valley Lake Sunapee Regional Planning Commission	UVLS RPC Offices	20
September 22nd	North Country Council	Littleton Farmers Market	~115
September 24th	Southern New Hampshire Planning Commission	Manchester Public Library	35
September 25th	Lakes Region Planning Commission	Gilford Public Library	35
September 29th	Central New Hampshire Regional Planning Commission ("meeting in a box" event)	Concord Farmers Market	~85
October 2nd	Rockingham Planning Commission	Portsmouth Public Library	35
October 9th	Rockingham Planning Commission ("meeting in a box" event)	Exeter Farmers Market	~45
October 9th	Upper Valley Lake Sunapee Regional Planning Commission, Commission meeting ("meeting in a box" event)	UVLS RPC Offices	20

Summary of Responses to Survey Questions

As mentioned above, participants at all events were asked a pair of questions from the online survey. The survey questions were printed on a large-format poster paper. Attendees were asked to place three small colored stickers ("dots") in the answer column they thought was most appropriate. The first survey question (#11 from the online survey) asked: **"Which top THREE factors most prevent or discourage you from bicycling more in New Hampshire or in your local community?"** From the 11 events in the table above, roughly 2,200 dots were placed. Figure 7 at right summarizes the answers. When comparing the public's responses at the engagement events to the responses from the online survey, obvious trends are apparent. While the resulting percent of answers or votes for the barriers to bicycling are different between the two data sets, the same three factors—see rows 2, 4 and 6--remain the top choices among both survey participants and public engagement event attendees. The table below indicates the differences between the results from the 11 public engagement events relative to the online survey.

Note: the online survey percentages total over 100%, because each respondent was asked to choose their top three choices, while the public event response percentages were based on the total number of selections or dots.

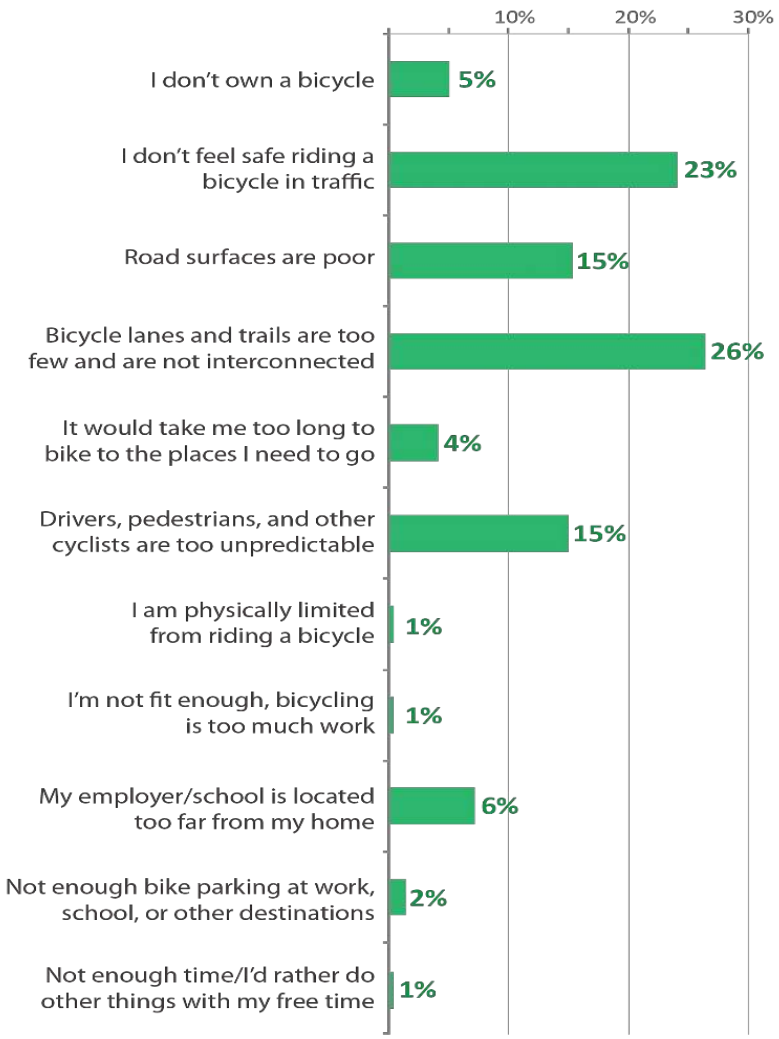


Figure 7. Factors Preventing or Discouraging Bicycling More

Question 11 from online survey: top responses	Online Survey Responses	Public Engagement Event Responses
Bicycle lanes and trails are too few and not interconnected	55% *(1st place)*	26% *(1st place)*

I don't feel safe riding a bicycle in traffic	47% *(2nd place)*	23% *(2nd place)*
Road surfaces are poor	31% *(3rd place)*	15% *(tied for 3rd place)*

In addition to the 11 choices offered for survey question #11, attendees were also able to include write-in answers in the "other" column. Figure 8 below highlights the answers that event attendees included to represent additional factors that discourage them from bicycling in their community. For brevity, write-in answers that were only included once were excluded from Figure 8.

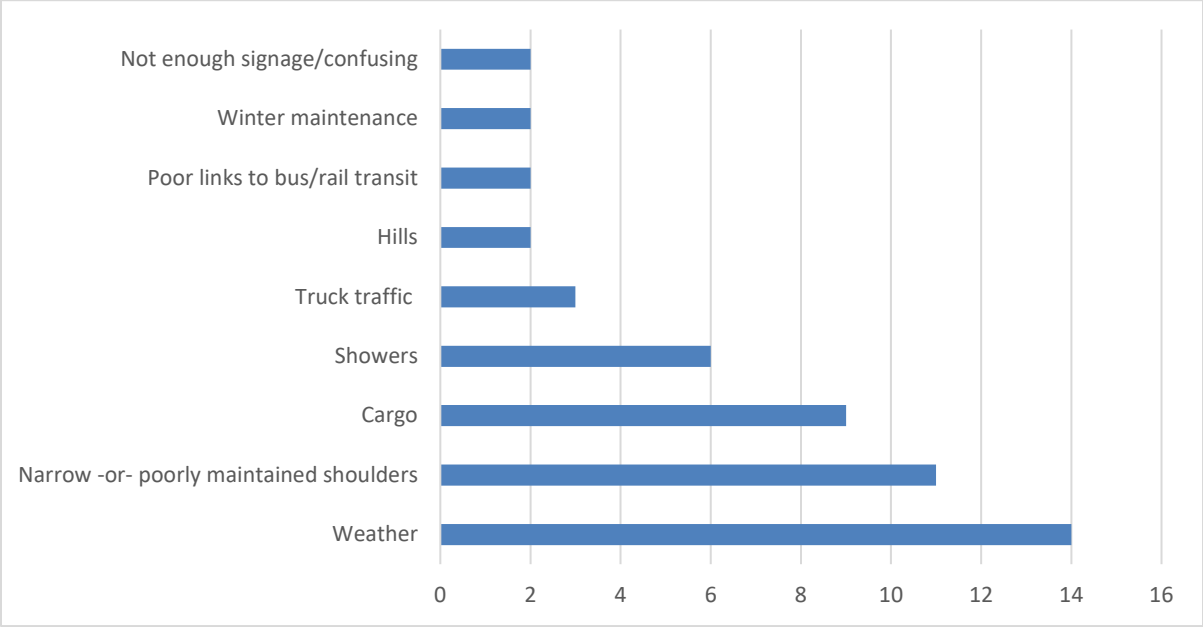


Figure 8. Other Factors which Discourage Bicycling

The second question public engagement event attendees were asked was adapted from question 13 from the online survey: **"Which of the THREE following improvements do you feel would most likely increase the number of trips that residents of New Hampshire make by walking or bicycling?"** From the 11 events described above, approximately 2,400 dots were placed. While the online survey question asked respondents to rank each individual project or program improvement based on its relative effectiveness, attendees at the 11 outreach events were asked to place their dots in the column adjacent to the three improvement they thought would most increase walk and bicycle trips in New Hampshire.

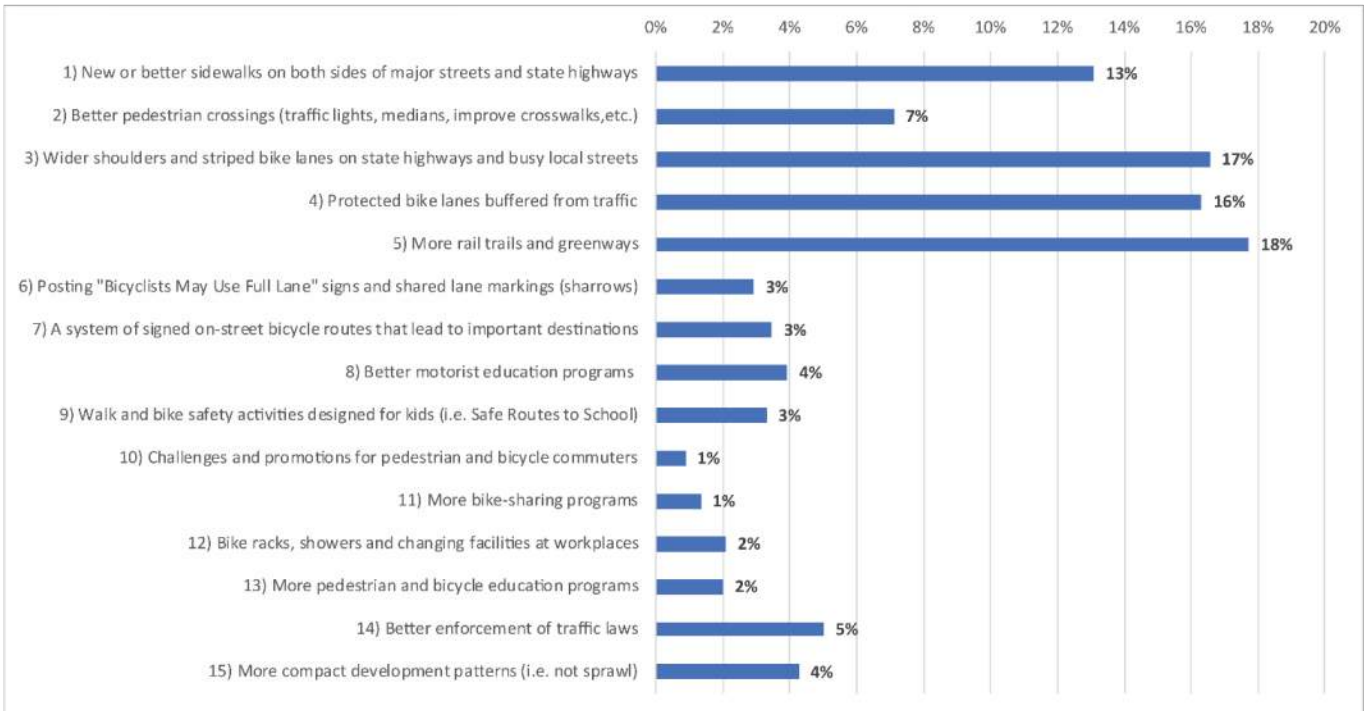


Figure 9. Improvements that would Increase Biking and Walking Trips

The top scoring answers to this question were also the top scoring answers in the online survey format. This supports the development of wider shoulders and striped bike lanes on state roadways and busy streets, protected bike lanes buffered from traffic, and more rail trails and greenways to increase comfort for a wide range of bicyclists across New Hampshire.

Question 13 from online survey: top responses	Online Survey Responses	Public Engagement Event Responses
More rail trails and greenways	74% *(1st place)*	18% *(1st place)*
Protected bike lanes buffered from traffic	71% *(2nd place)*	16% *(3rd place)*
Wider shoulders and striped bike lanes on state roadways and busy local streets	63% *(3rd place)*	17% *(2nd place)*

Appendix 2: Bicycle Level of Traffic Stress

Purpose

In 2018, four of New Hampshire's Metropolitan Planning Organizations (MPOs), one rural Regional Planning Commission (RPC), and Plymouth State University (PSU) partnered on an FHWA-funded pilot project to develop a shared model for evaluating Bicycle Level of Traffic Stress (BLTS) in New Hampshire: https://www.nh.gov/dot/programs/bikeped/documents/26962r_report.pdf. Led by Rockingham Planning Commission, the purpose of the BLTS analysis was to more accurately evaluate existing roadway conditions and needs from the perspective of a bicyclist. The BLTS results helped inform the identification and prioritization of proposed projects within the New Hampshire Department of Transportation (NHDOT) Statewide Pedestrian & Bicycle Transportation Plan, as well as the development of performance measures for tracking implementation.

Model Development

The project team refined a BLTS model adapted from the Mineta Transportation Institute (MTI) Report 11-19 *Low-Stress Bicycling and Network Connectivity* (2012) and PSU graduate student Laura Getts' master thesis *Methods for Investigating and Advancing Active Transportation in New Hampshire* (2017). To tailor the BLTS analysis to the rural character of New Hampshire's road system and limited roadway attribute data, the BLTS model was divided into three integrated versions:

- **Model Version 1** – For roadways with only posted speed, direction, lane, and traffic data
- **Model Version 2** – For roadways with additional bikeway/shoulder width data
- **Model Version 3** – For roadways with additional bikeway/shoulder and parking width data

For a given roadway segment, the BLTS model selects the most data-intensive version based on available data. If a bikeway or bikeable shoulder is frequently blocked by motor vehicles, the project team recommended using Version 1. Version 3 was not used as part of the analysis for this project due to data limitations.

While the inputs vary among the three versions, outputs remain uniform, ranging between lowest-stress roadways (BLTS 1) and highest-stress (BLTS 4) facilities. See **Table 1** for descriptions of the BLTS output levels.

Table 1: Bicycle Level of Stress Levels (Adapted from: PSU, May 2019)

BLTS Level	Description	User Groups
BLTS 1 (Lowest Stress)	Roadways with strong separation between motor vehicles and bicyclists or roadways with an exceptionally low number of daily motor vehicles traveling at low speeds. Suitable to children.	All Ages and Abilities
BLTS 2	Roadways with designated bikeways, providing some physical separation from motor vehicles. Suitable to most adults.	Interested but Concerned/Somewhat Confident
BLTS 3	Roadways with no designated bikeways, multilane traffic, and motor vehicles traveling at moderate speeds. Suitable to some adults.	Somewhat Confident/Highly Confident
BLTS 4	Roadways with no designated bikeways, multilane traffic, and motor vehicles traveling at high speeds. Suitable to a limited number of adults.	Highly Confident

Data Collection

To develop a consistent baseline of input data for measuring BLTS, the project team collected and verified roadway attribute data, including posted speed limits and the presence of bikeways, on-street parking, and roadway shoulders within the partner agencies' boundaries (see **Table 2** for a full list of BLTS model inputs). Concurrent with the FHWA project, NHDOT also collected the selected roadway attribute data for state-owned roadways in the State's remaining four RPCs to inform the Statewide Pedestrian & Bicycle Transportation Plan. Intersections were not included in the BLTS analysis.

Table 2: BLTS Model Inputs (Adapted from: PSU, May 2019)

Input	Description	Model Versions
Speed	The posted speed limit of a roadway segment	Required: 1, 2, 3
Direction	One-way or two-way operation direction of a roadway	Required: 1, 2, 3
Lanes	Total number of travel lanes	Required: 1, 2, 3
Daily Traffic	Estimate of the average number of motor vehicles per day	Required: 1. Required for 2 and 3 only when shoulder is <4' wide
Shoulder Width	Distance from the edge of pavement to the fog line	Optional: 2, 3
Bike Lane Width	Width of existing bike lane or road shoulders that are ≥ 4 feet	Required: 3 Optional: 1, 2
Parking Width	Width of on-street parking area	Required: 3 Optional: 1, 2

BLTS Output Levels

Because of the different inputs for the three versions of the BLTS model, the project team created three different matrices for rating roadways within the BLTS 1-4 scheme. **Table 3** shows the BLTS matrix for Version 1, **Table 4** shows the BLTS matrix for Version 2, and **Table 5** shows the BLTS matrix for Version 3. Centerline data was not available for the analysis, so the first row in Version 1 was not used. Version 3 was not used as part of the analysis for this project due to data limitations.

Table 3: BLTS Model, Version 1 (Adapted from: PSU, May 2019)

		Posted Speed				
Lanes	**Daily Traffic**	**≤20 mph**	**21-25 mph**	**26-30 mph**	**31-35 mph**	**≥36 mph**
2-way, 2 through-lane road with no centerline	0-750	BLTS 1	BLTS 1	BLTS 2	BLTS 2	BLTS 3
	751-1,500	BLTS 1	BLTS 1	BLTS 2	BLTS 3	BLTS 3
	1,501-3,000	BLTS 2	BLTS 2	BLTS 2	BLTS 3	BLTS 4
	>3,000	BLTS 2	BLTS 3	BLTS 3	BLTS 3	BLTS 4
1-way, 1 through-lane road *or* 2-way, 2 through-lane road with centerline	0-750	BLTS 1	BLTS 1	BLTS 2	BLTS 2	BLTS 3
	751-1,500	BLTS 2	BLTS 2	BLTS 2	BLTS 3	BLTS 3
	1,501-3,000	BLTS 2	BLTS 3	BLTS 3	BLTS 3	BLTS 4
	>3,000	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 4
2-way, 3-4 through-lane road	0-8,000	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 4
	>8,000	BLTS 3	BLTS 3	BLTS 4	BLTS 4	BLTS 4
>4 through-lane road	Any	BLTS 3	BLTS 3	BLTS 4	BLTS 4	BLTS 4

Table 4: BLTS Model, Version 2 (Adapted from: PSU, May 2019)

		Posted Speed			
Lanes	**Bikeway Width**	**≤25 mph**	**26-30 mph**	**31-35 mph**	**≥36 mph**
2-way, 2 through-lane road	≥6 feet	BLTS 1	BLTS 2	BLTS 2	BLTS 3
	4-5 feet*	BLTS 2	BLTS 2	BLTS 2	BLTS 4
2-way, 3-4 through-lane road	≥6 feet	BLTS 2	BLTS 2	BLTS 2	BLTS 3
	4-5 feet*	BLTS 2	BLTS 2	BLTS 2	BLTS 4
>4 through-lane road	Any*	BLTS 3	BLTS 3	BLTS 3	BLTS 4

Note * - shoulder width of <4 feet automatically triggers the use of Model Version 1 algorithm. Therefore, Daily Traffic volume ranges are not shown in Table 4 or Table 5.

Separated bike lanes received a BLTS 1 as they are to be considered physically separated, low stress facilities.

Table 5: BLTS Model, Version 3 (Adapted from: PSU, May 2017)

		Posted Speed			
Lanes	**Bikeway + Parking Width**	**≤25 mph**	**26-30 mph**	**31-35 mph**	**≥36 mph**
1-way, 1 through-lane road	≥6 feet	BLTS 1	BLTS 2	BLTS 2	BLTS 3
	4-5 feet	BLTS 2	BLTS 2	BLTS 2	BLTS 4
2-way, 2 through-lane road	≥15 feet	BLTS 1	BLTS 2	BLTS 3	BLTS 3
	12-14 feet	BLTS 2	BLTS 2	BLTS 3	BLTS 3
1-way, 2-3 through lane road *or* 2-way, 3-4 through-lane road	≥15 feet	BLTS 2	BLTS 3	BLTS 3	BLTS 4
Other	Any	BLTS 3	BLTS 3	BLTS 3	BLTS 4

Data Verification

Following an initial run of the BLTS model, the project team "ground-truthed" the outputs and manually adjusted values where appropriate. In addition, the project team conducted two public input forums and developed online map application to solicit public feedback on the accuracy of the model outputs. In certain cases, some roads had missing posted speed limit data. It was agreed to move forward with the project that 30 mph would be the assumed posted speed limit in scenarios where this data was not available.

BLTS Results

Figure 1 through **Figure 7** shows the BLTS levels for all state-owned roadways in New Hampshire *excluding roadways where biking is not allowed*, such as Interstate 95 (shown as white lines). **Table 6** summarizes the miles of State roadways for each BLTS level by region.

Table 6: BLTS Outputs by Regional Planning Commission

	Existing Miles (% of Total, excluding unclassified roadways)			
Region	**BLTS 1**	**BLTS 2**	**BLTS 3**	**BLTS 4**
Central New Hampshire RPC	0 (0%)	51 (12%)	176 (40%)	77 (17%)
Lakes RPC	0 (0%)	128 (19%)	281 (42%)	183 (28%)
Nashua RPC	0 (0%)	41 (19%)	119 (55%)	56 (26%)
North Country Council	0 (0%)	260 (23%)	520 (46%)	222 (19%)
Rockingham PC	1 (0%)	98 (21%)	221 (48%)	73 (16%)
Southern New Hampshire PC	0 (0%)	31 (8%)	161 (42%)	98 (26%)
Southwest RPC	2 (0%)	93 (18%)	277 (53%)	154 (29%)
Strafford RPC	0 (0%)	117 (32%)	152 (41%)	101 (27%)
Upper Valley Lake Sunapee RPC	0 (0%)	84 (17%)	223 (45%)	111 (22%)
Statewide Total	3 (0%)	902 (19%)	2128 (45%)	1076 (23%)

Figure 1: BLTS Outputs, Statewide

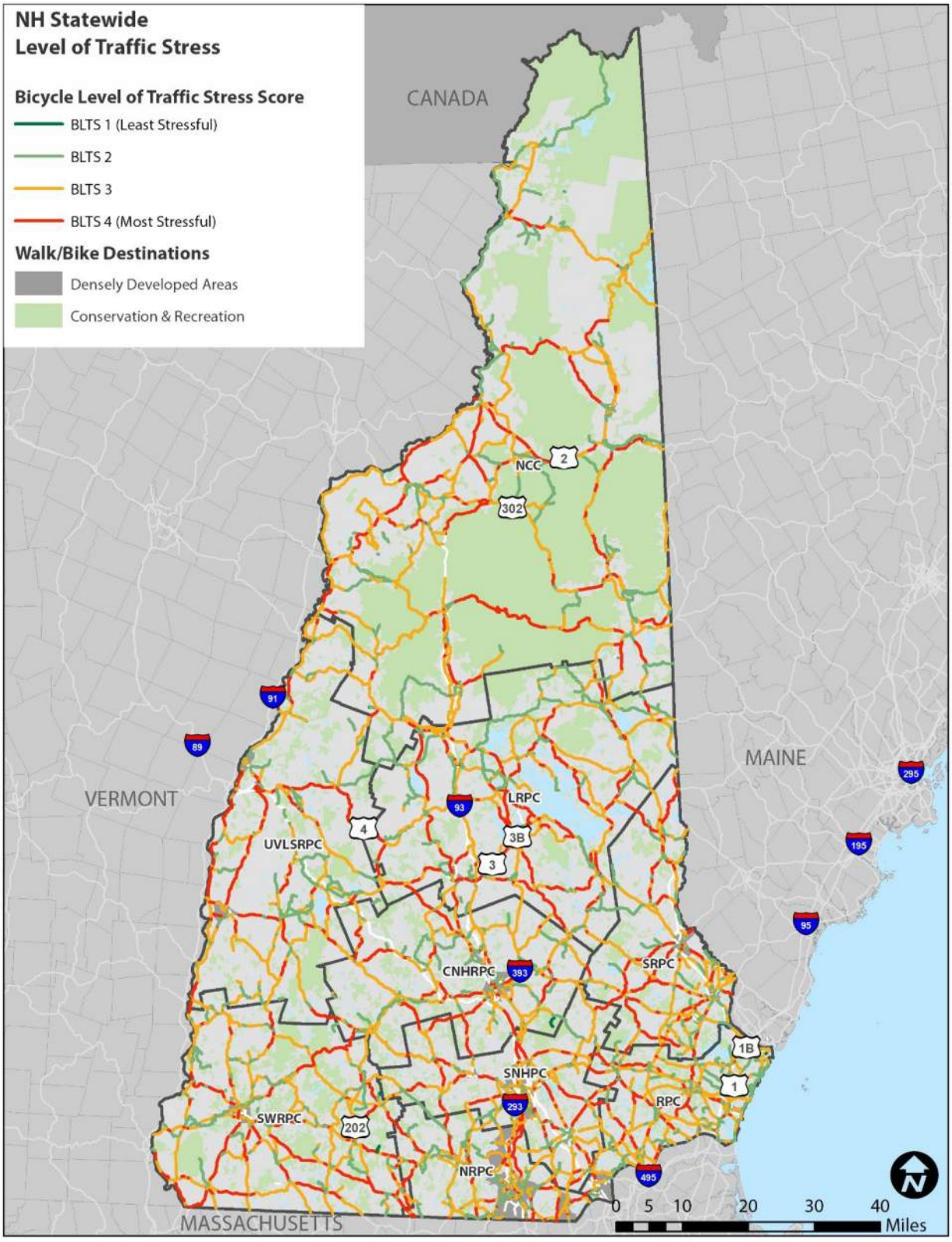


Figure 2: BLTS Outputs, North Country

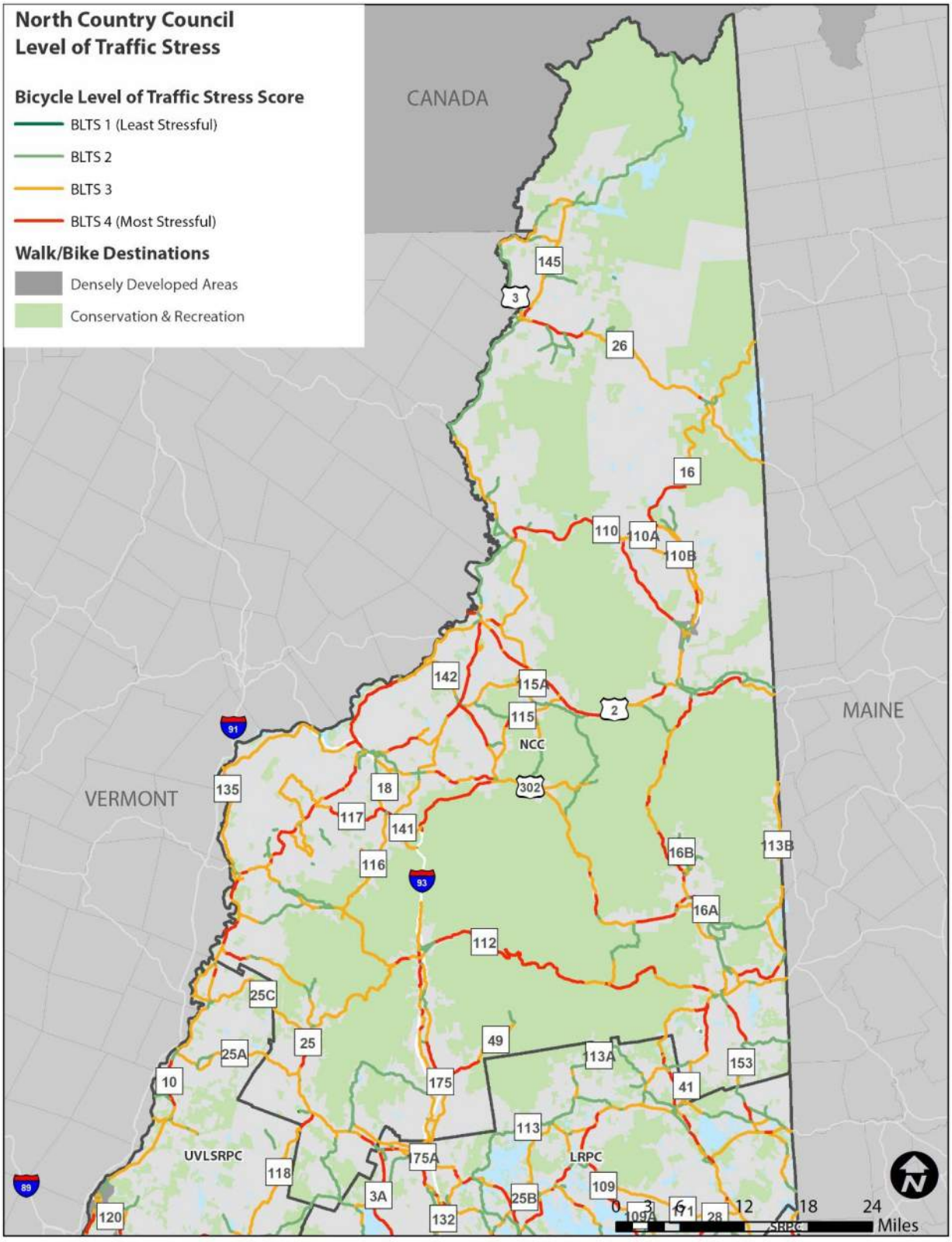


Figure 3: BLTS Outputs, Lakes Region

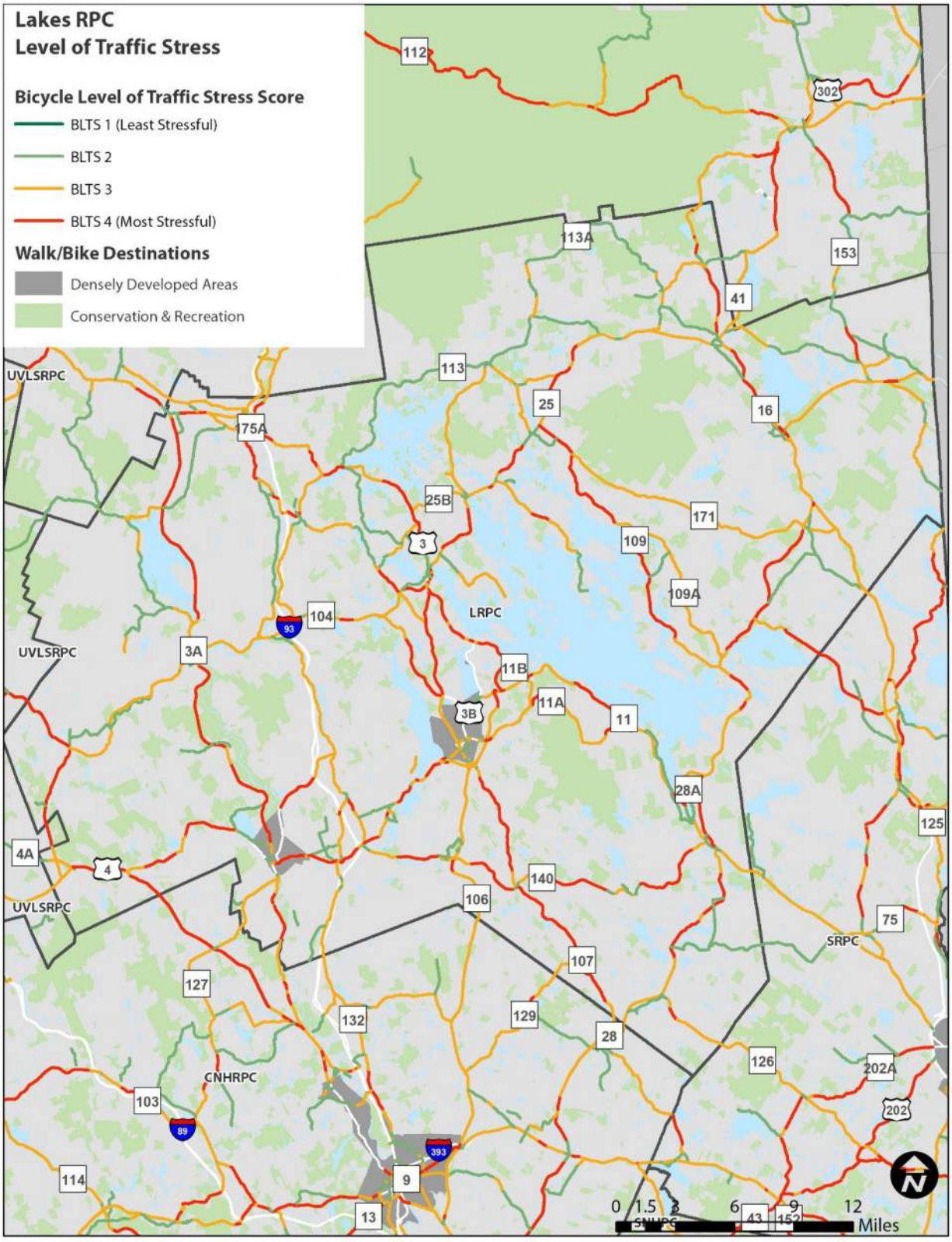


Figure 4: BLTS Outputs, Upper Valley-Lake Sunapee Region

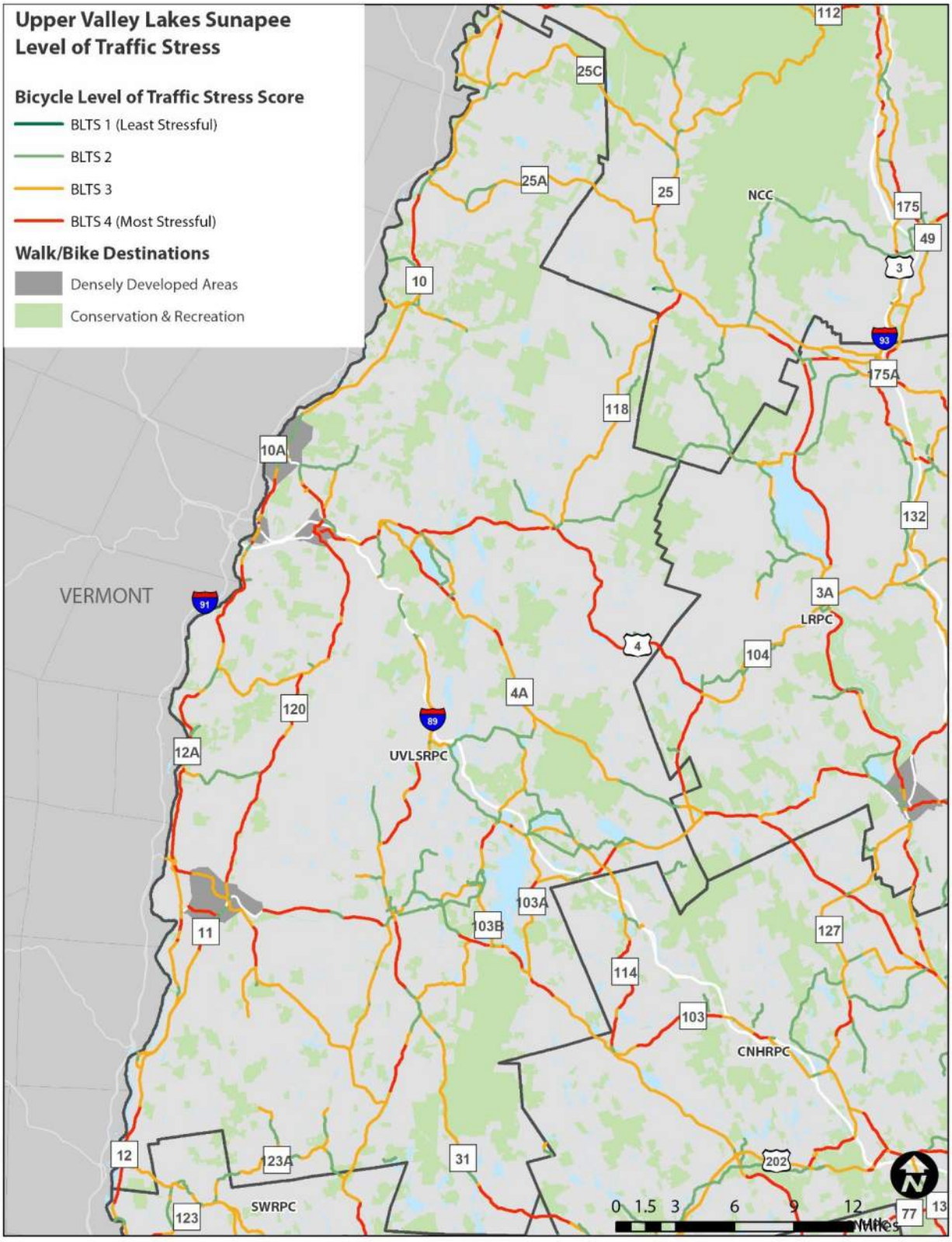


Figure 5: BLTS Outputs, Southwest Region

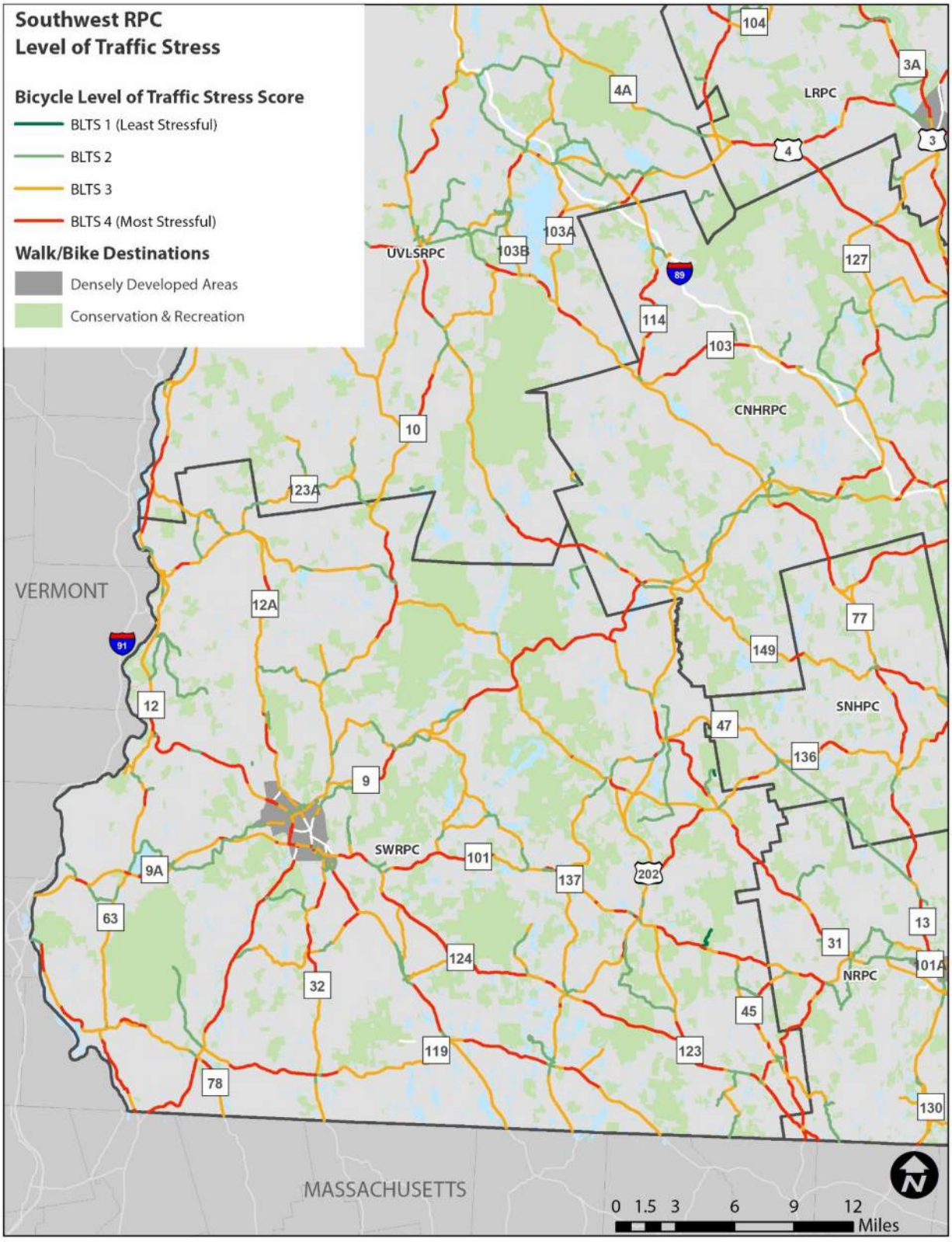


Figure 6: BLTS Outputs, Merrimack Valley

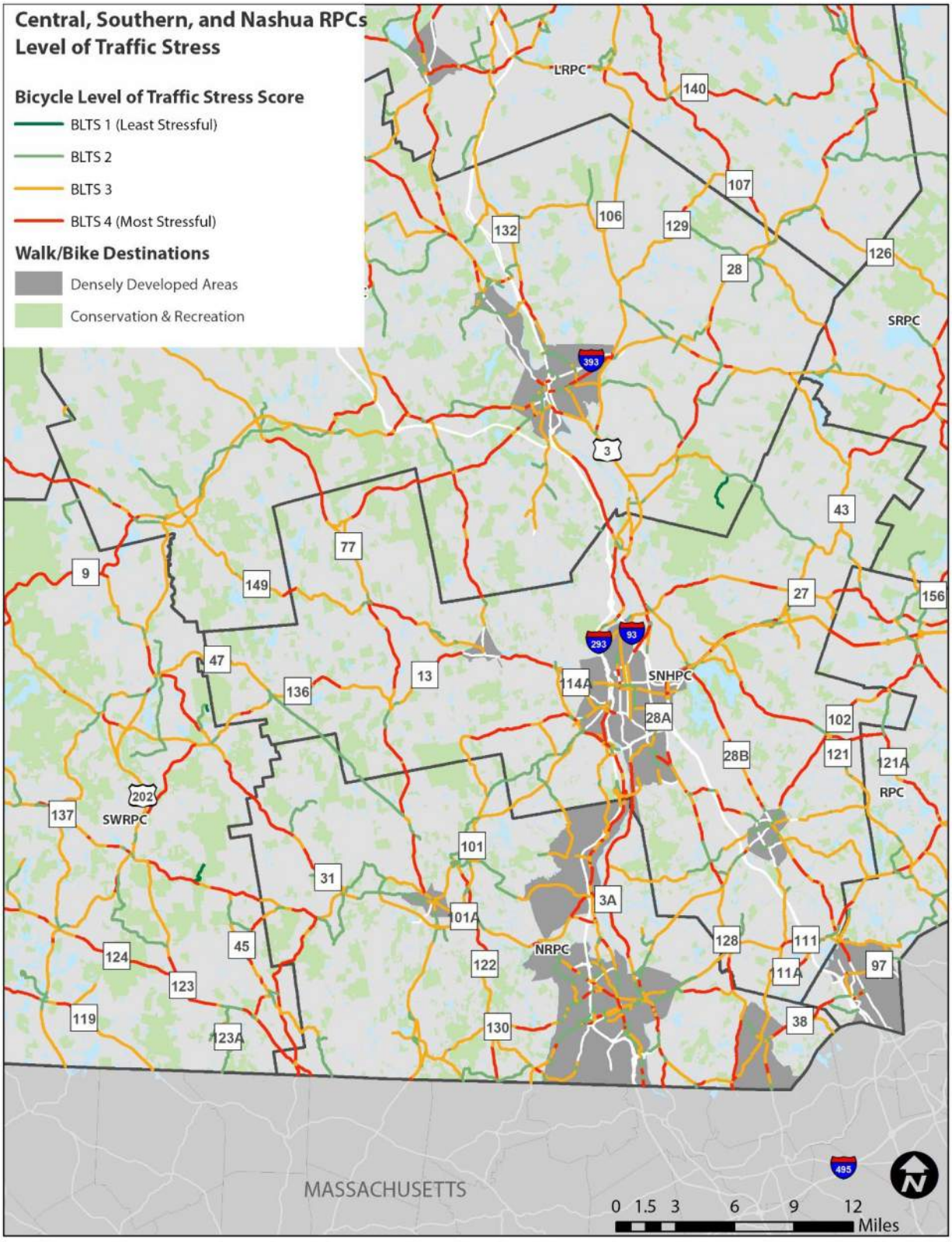
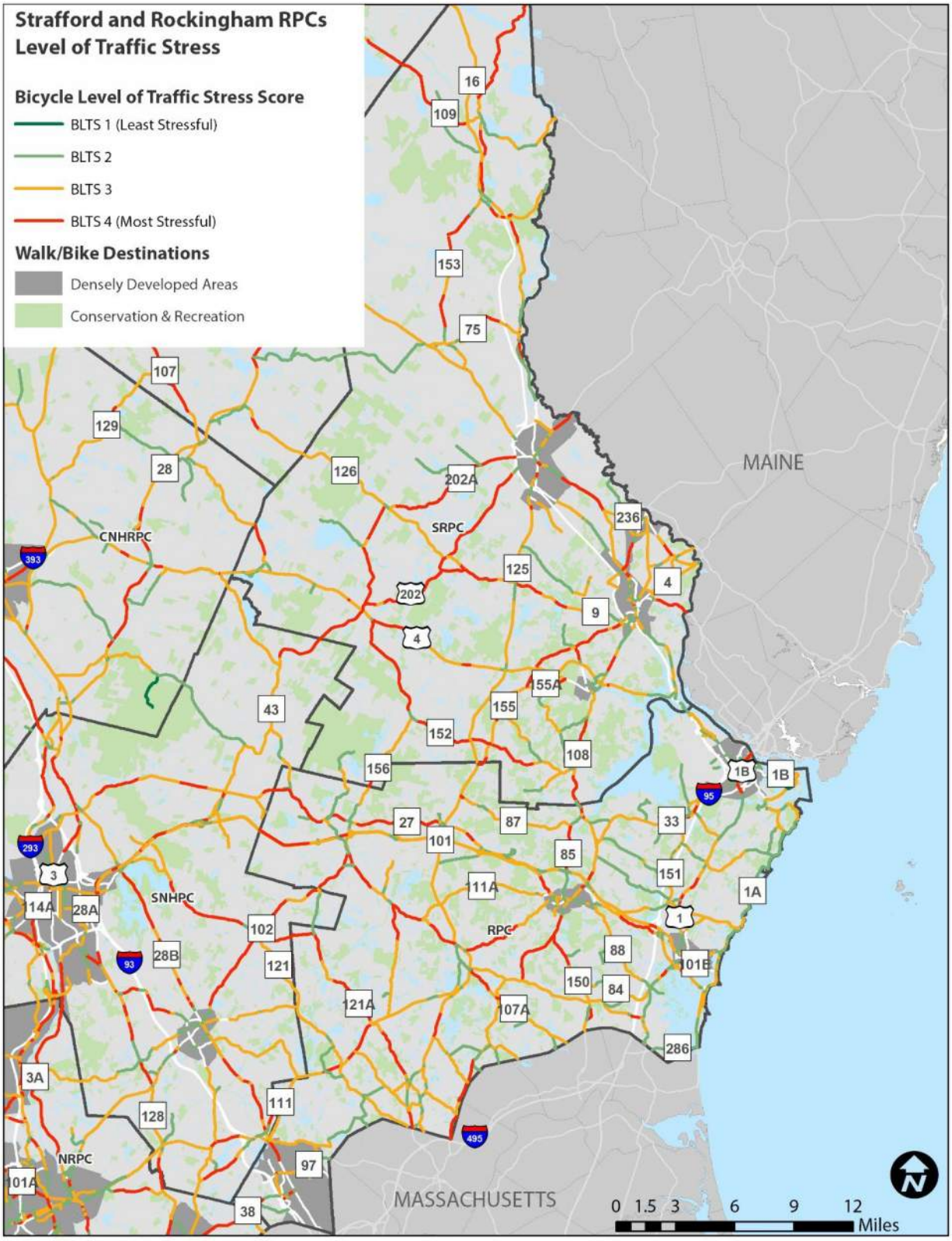


Figure 7: BLTS Outputs, Seacoast Region



Citations

Getts, L. *Methods for Investigating and Advancing Active Transportation in New Hampshire.* Plymouth State University. Masters Thesis, Advisor: Villamagna, A. July 2017. <https://digitalcommons.plymouth.edu/etd/126/>

Mekuria, M., Furth, P., and H. Nixon. *Low-Stress Bicycling and Network Connectivity*. Mineta Transportation Institute: Report 11-19. May 2012. <https://transweb.sjsu.edu/sites/default/files/1005-low-stress-bicycling-network-connectivity.pdf>

Villamagna, A., L. Getts, and R. Young. *Active Transportation Accounting: Developing Metrics for Project Prioritization*. New Hampshire Department of Transportation. Project ID #26962R.

Villamagna, A. and R. Young. *Level of Traffic Stress Modeling Guide*. Plymouth State University. May 2019.

Appendix 3: Design Guidance

General Design Guidance

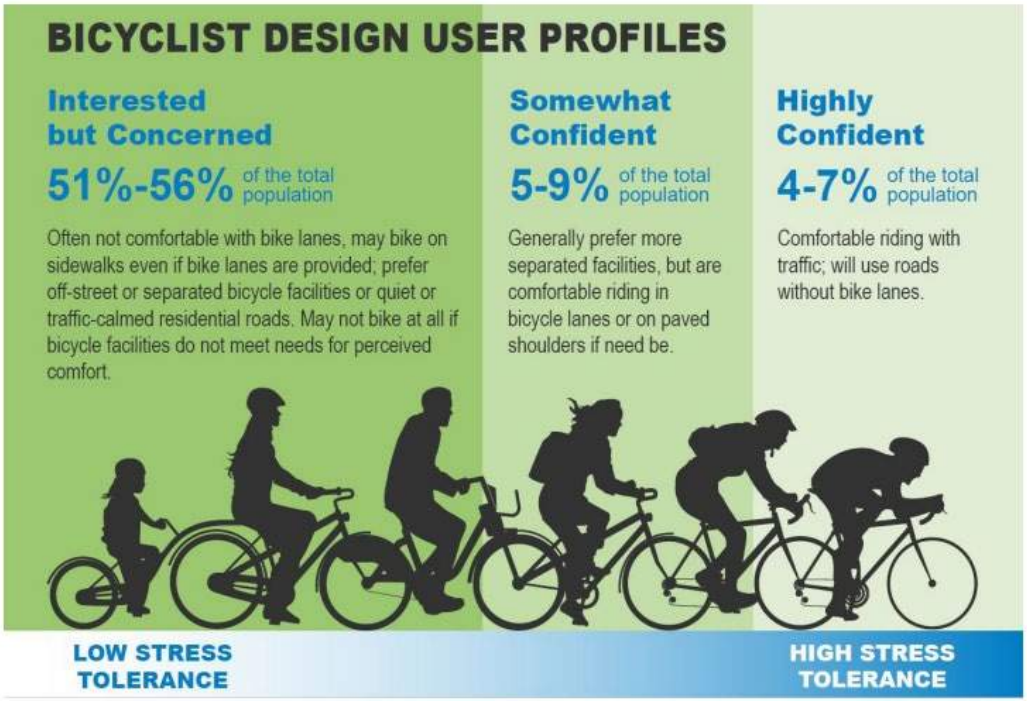
The Design Guidance section references existing national and state resources to provide technical guidance on the requirements for the different design elements and components of the various active transportation facilities considered in the Plan. This section includes additional information and resources on:

- Bicycle User Types
- Bikeway Facility Selection
- Types of Bicycles and Design Needs
- Pedestrian User Types
- Design Resources (National and New Hampshire-specific)

Information on Complete Streets design is provided in Chapter 4 of the report and an example of Complete Street design guidance from Portsmouth, NH can be found at the end of this Appendix.

Bicycle User Types

When selecting and designing bicycle facilities, it is important to understand the people that will be using them. Bicyclists have differing skill levels and experience, ages, and purposes for cycling. Of adults that have a stated interest in bicycling, national research has shown that there are generally three types



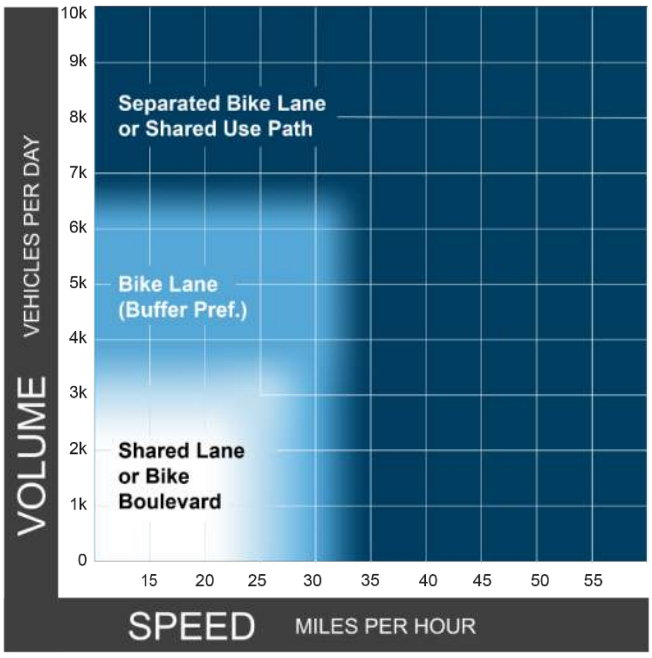
of users that can help to inform bicycle facility planning. These three users along with a non-user group are described below.

Bikeway Facility Selection

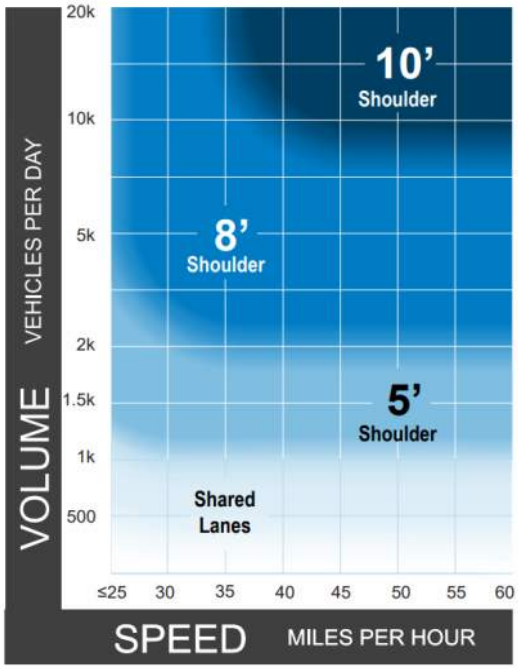
As outlined in the Federal Highway Administration's Bikeway Selection Guide, different types of bikeways are better suited for different roadways based on considerations such as how fast and how frequently vehicles use the road and the available roadway width. Bikeways that are comfortable for the "interested but concerned" include separated bike lanes and off-street paths.

As a starting point to identify a preferred bikeway facility, the FHWA chart shown below can be used to determine the recommended type of bikeway to be provided in particular roadway speed and volume situations. The chart is used by first identifying the daily traffic volume and travel speeds on the existing or proposed roadway, and then locating the facility types indicated by those key variables. Streets with higher speeds and volumes should have more separated bikeway facilities. The FHWA Bikeway Selection Guide, and the associated chart, are meant to be a starting point to select a bikeway facility type in addition to the results of the existing conditions analysis, public input, and professional judgment. As NHDOT develops its own guidance, practitioners can also use New Hampshire's existing 3-foot passing law as a starting point. Following that law, and assuming 11' lanes, NHDOT guidance might recommend a 4' shoulder for posted speeds of 30 mph, a 5' shoulder for posted speeds between 30 – 40 mph, and a 6' shoulder for posted speeds between 40 – 50 mph, adding 1 foot to recommended shoulder width for a curb or guardrail.

Preferred Bikeway Type for Urban, Urban Core, Suburban and Rural Town Contexts



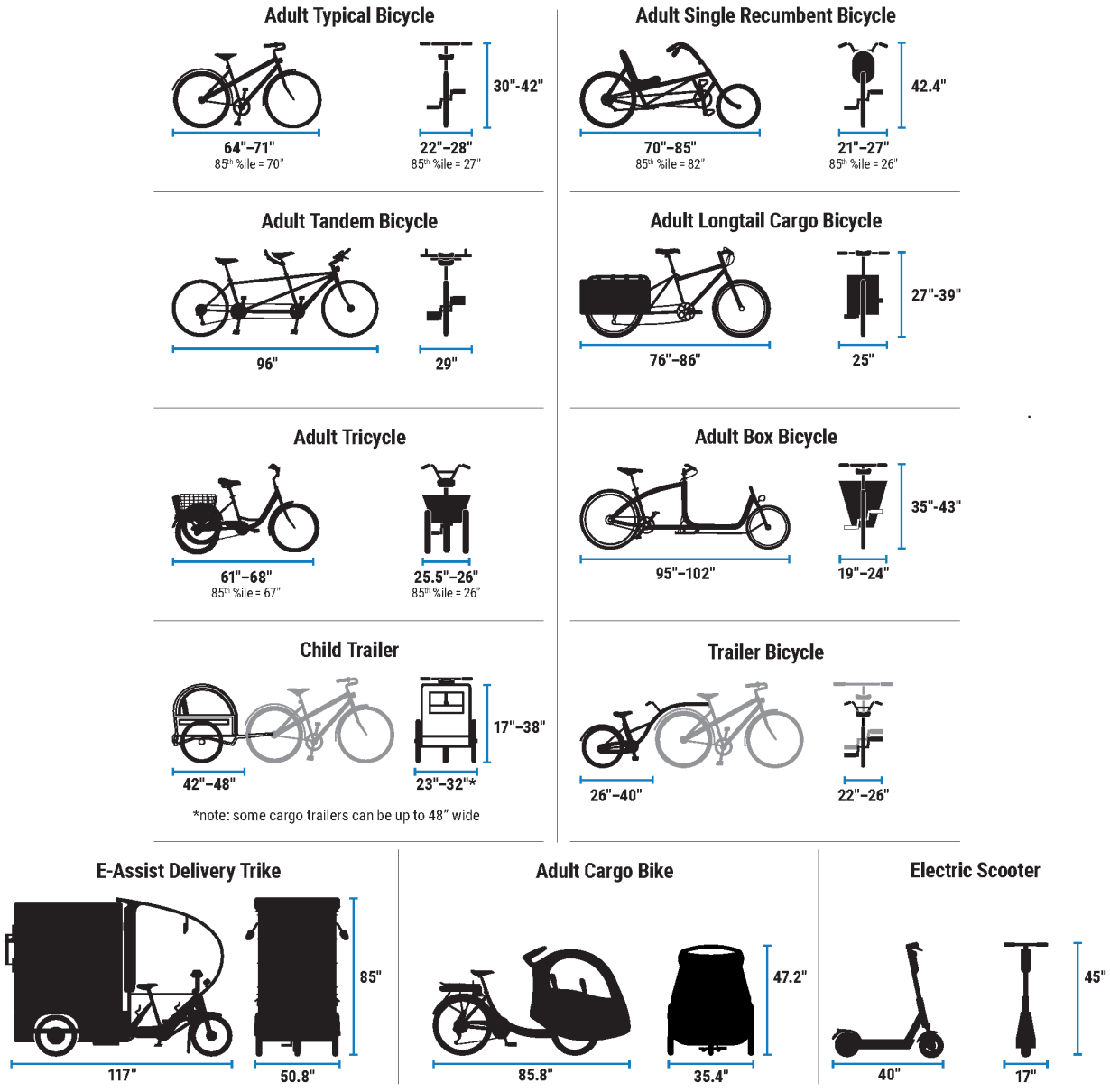
Preferred Shoulder Widths for Rural Roadways



*Source: FHWA Bikeway Selection Guide (*the percentages above reflect only adults who have stated an interest in bicycling.)*

Types of Bicycles and Design Needs

The image below highlights the different types of unique bicycles that each have their own design needs based on their height and width. The operating width of a bikeway will be wider based on the type of equipment used.



General design guidance for the space needed for different types of bicycles.

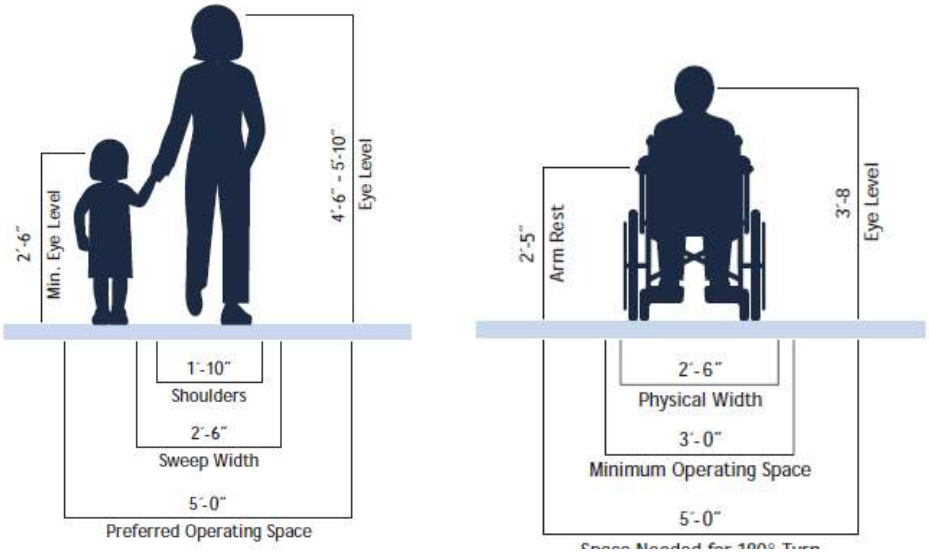
Pedestrian User Types

On any given day, most people are pedestrians in some way or form. Whether they are crossing a street to school or traveling through a parking lot on their way into the office, they are a pedestrian. Whether they are walking, in a wheelchair, running, or using a scooter, they are a pedestrian. Therefore, it is important to design and implement connected pedestrian networks that are safe and comfortable for all ages and abilities.

New Hampshire's transportation network should accommodate pedestrians with a variety of needs, abilities, and possible impairments. Age is one major factor that affects pedestrians' physical characteristics, walking speed, and environmental perception. While age may be a major indicator, there is no one universal approach to pedestrian types and needs. Other categories that could be used to describe different types of pedestrians include:

- **Activity -** Pedestrians practicing different activities (e.g., walking, wheeling, running, using a scooter, etc.) will have various abilities and comfort levels using pedestrian networks.
- **Social Use -** Various social uses (e.g., single pedestrian, group of pedestrians, congregating pedestrians, etc.) of pedestrian facilities will result in various needs for a safe and comfortable network.
- **Trip Purpose -** A pedestrian's reason for travel (e.g., transportation, recreation, etc.) may result in different needs and comfort levels for those using pedestrian networks.
- **Ability -** Pedestrians present a wide variety of abilities (e.g., full ambulatory, visual impairment, auditory impairment, physical impairment, etc.), often resulting in different needs for a safe and comfortable pedestrian network.

Title II of the Americans with Disabilities Act (ADA) requires all public agencies to ensure that their services, programs, and activities are accessible to persons with disabilities. ADA compliance ensures all persons, regardless of their abilities, will be able to use public facilities to their full advantage.



General design guidance for the space needed for pedestrians walking or using a wheelchair for one-directional travel.

Design Resources

Table 1. Bicycle and Pedestrian Resources for Engineers and Planners

Title	Author	Date
National Resources		
Guide for the Planning, Design, and Operation of Pedestrian Facilities	AASHTO	July 2004
Guide for the Development of Bicycle Facilities	AASHTO	2012
Manual on Uniform Traffic Control Devices for Streets and Highways	FHWA	2009
Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts	FHWA	September 2016
Bikeway Selection Guide	FHWA	February 2019
FHWA Memorandum: Bicycle and Pedestrian Facility Design Flexibility	FHWA	August 2013
Pursuing Equity in Pedestrian and Bicycle Planning	FHWA	May 2016
Strategic Agenda for Pedestrian and Bicycle Transportation	FHWA	September 2016
FHWA Guidance: Bicycle and Pedestrian Provisions of Federal Transportation Legislation	FHWA	December 2015
Highway Capacity Manual	Transportation Research Board (TRB)	2016
Case Studies in Delivering Safe, Comfortable, and Connected Pedestrian and Bicycle Networks	FHWA	December 2015
Designing Walkable Urban Thoroughfares: A Context Sensitive Approach	ITE	2010
FHWA Memorandum: Proven Safety Countermeasures	FHWA	January 2015
Guidebook for Developing Pedestrian and Bicycle Performance Measures	FHWA	March 2016
Road Diet Informational Guide	FHWA	2014
Pedestrian and Bicycle Funding Opportunities	FHWA	August 2016
Bicycle and Pedestrian Funding, Design, and Environmental Review: Addressing Common Misconceptions	FHWA	August 2015

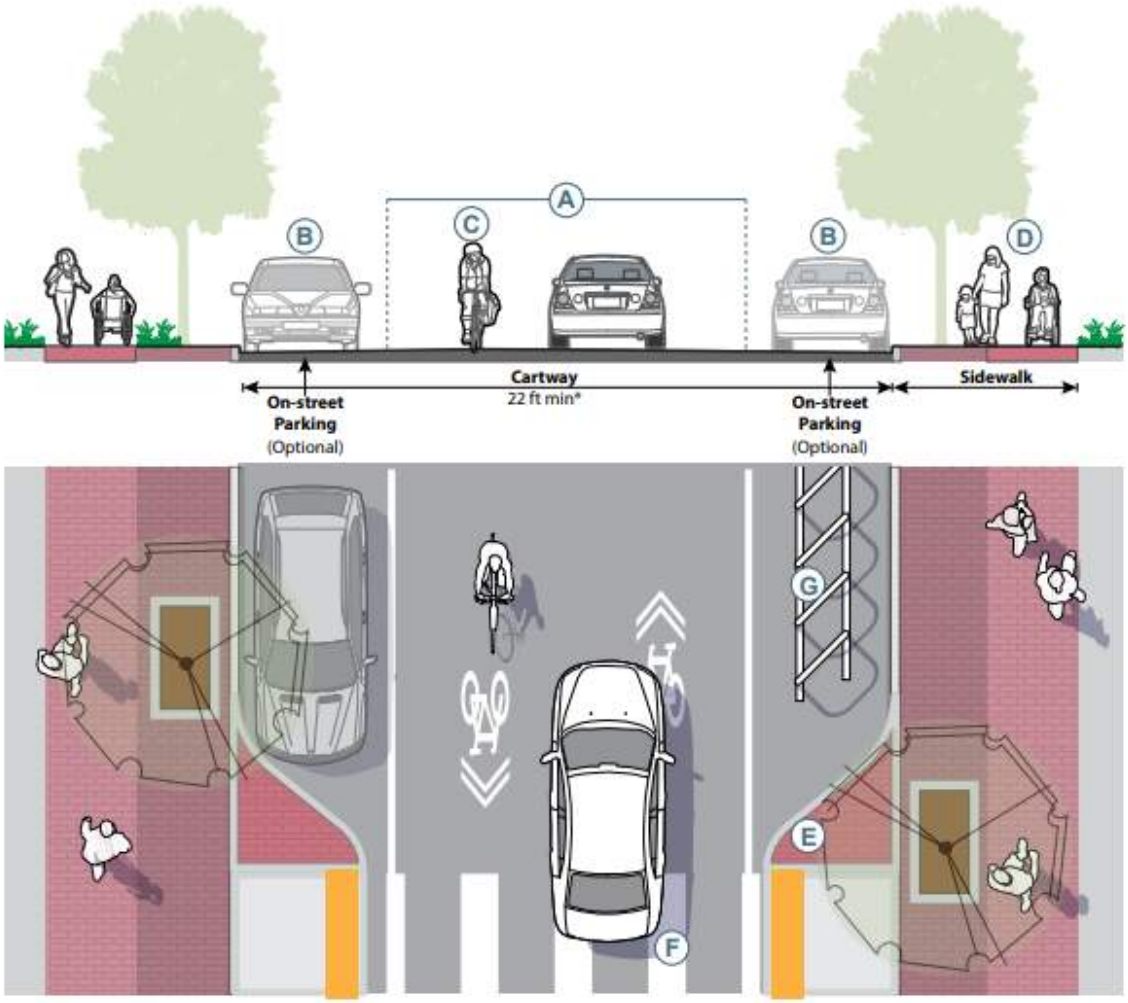
Title	Author	Date
Bicycle and Pedestrian Funding, Design, and Environmental Review: Addressing Common Misconceptions	FHWA	August 2015
Transit Street Design Guide	NACTO	April 2016
Small Towns and Rural Multimodal Networks	FHWA	December 2016
Public Rights-of-Way Accessibility Guidelines (PROWAG)	U.S. Access Board	2011
Supplemental Notice of Proposed Rulemaking (SNPRM) on Accessibility Guidelines for Shared Use Paths	U.S. Access Board	2013
Urban Street Design Guide	NACTO	October 2013
Separated Bike Lane Planning and Design Guide	FHWA	May 2015
Urban Bikeway Design Guide	NACTO	March 2014
Bicycle Facilities and the Manual on Uniform Traffic Control Devices	FHWA	December 2015
Incorporating On-Road Bicycle Networks into Resurfacing Projects	FHWA	March 2016
Separated Bike Lane Design Guide	MassDOT	2015
Streets for Pandemic Response and Recovery	NACTO	June 2020
Bicycle Network Planning and Facility Design Approaches in the Netherlands and the United States	FHWA	April 2016
Urban Street Stormwater Guide	NACTO	June 2014
Don't Give Up at the Intersection	NACTO	May 2019
New Hampshire Resources		
Trail with Rail Design Standards	NHDOT	
Highway Design Manual Vol. 1 & 2	NHDOT	1999
Standard Plans for Road Construction	NHDOT	
Highway Design Detail Sheets	NHDOT	
Traffic Design Detail Sheets	NHDOT	

Complete Streets Design Guidance

Portsmouth NH Example

The City of Portsmouth, New Hampshire's Complete Streets Design Guidelines (https://files.cityofportsmouth.com/files/planning/CompleteStreetsGuideJuly2017.pdf) document presents the fundamental design elements and dimensions for creating a complete street, for each of seven street classifications that appear in Portsmouth. The seven classifications are: Neighborhood Slow Street, City Core Slow Street, Neighborhood Connector, City Core Connector, Primary Connector, Gateway Corridor, and Industrial/Business Access. For each classification, the document provides a description of the common characteristics of each street type, a map of the Portsmouth street network that shows where the classification applies, a graphic of common street features, and a page of design guidelines. The common street features and design guidelines for the City Core Slow Street classification are included for reference on the following pages.

City Core Slow Street: Common Street Features



Critical Design Features

- (A) Narrow travel lanes to create slow-speed conditions.
- (B) On-street parking provides easy access.
- (C) Bicyclists operate within the roadway, typically in a shared lane. No center line is marked to encourage safe, courteous passing.
- (D) Pedestrians generally walk on a separated sidewalk, but should feel confident that motorists will yield when they wish to cross.

Additional Potential Design Features

- (E) Curb Extension
- (F) Mid-Block Crosswalk
- Benches
- Pedestrian scale lighting
- (G) Bike corral on roadway

* Some City Core Slow Streets may have an additional 2 ft of flexible space in their cross-section R.O.W's.

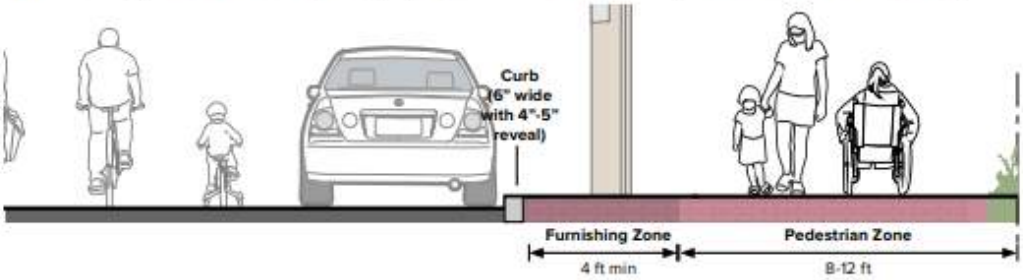
City Core Slow Street: Design Guidelines

Bicycle Network

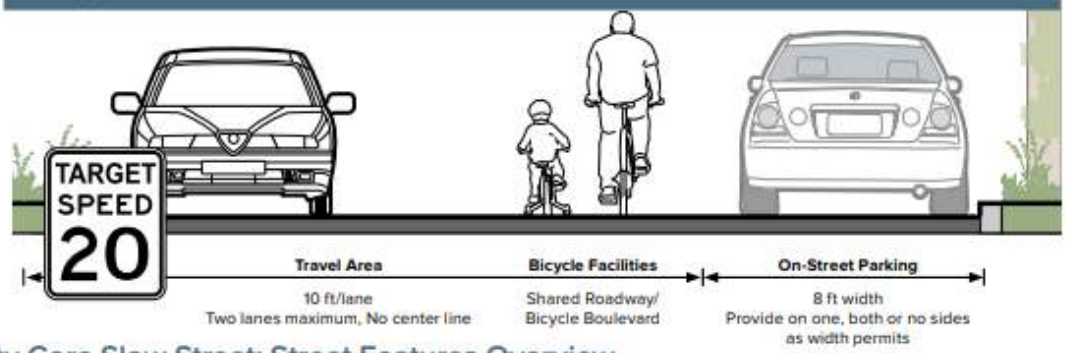
The recommended bikeway on City Core Slow Streets include **shared lane markings** or a **bicycle boulevard**. Slow motor vehicle speeds and low volumes create comfortable on-road riding conditions. In rare contexts, **buffered** or regular **bike lanes** may be appropriate.

Pedestrian Network

Sidewalks are required on City Core Slow Streets. A wide pedestrian zone with paved furnishing zone maximizes usable pedestrian space. In some cases, where streets may lack sidewalks, create a **shared street** where pedestrians walk in the cartway.



Cartway



City Core Slow Street: Street Features Overview

	Bicycle and Pedestrian Enhancements	Traffic Calming	Curbside Management	Traffic Management
Required	• Sidewalks	N/A	• Curb • Street Lighting	N/A
High Priority	• Bike racks	N/A	• On-street parking • Furnishing zone • Street trees	N/A
Appropriate in Limited Circumstances	• Signed bicycle route • Shared lane markings • Bicycle boulevard • Bike lane • Buffered bike lane • Bike corral • Shared street	• Mid-Block Crosswalk • Bus shelter • Raised speed reducer • Curb extension / bulb out	• Planting strip	• Loading zones • Priority emergency route
Not Required	• Sidepath • Separated bike lane	• Bus pull-off • Pedestrian refuge island	• Shoulder	N/A
Not Appropriate	N/A	• Chicanes • Yield street	N/A	• Truck Route • Center line striping (double yellow)

Appendix 4: Walk, Bike, and Safe Routes to School Scorecards

This Appendix expands on Table 1 found in the Existing Conditions chapter of the main plan document that compares New Hampshire's League of American Bicyclists (LAB) Bicycle-Friendly State scorecard, its Walk Friendly Communities designations, and its Safe Routes Partnership State Report Card to those of its neighbors Vermont, Maine, and Massachusetts. The League of American Bicyclists score includes national rank (with 1 being the best), while the Safe Routes Partnership scorecard gives an overall score (with high being better than low).

Walk Friendly Communities

Walk Friendly Communities began in 2011 as an initiative of the University of North Carolina Highway Safety Research Center. According to the organization's website, a Walk Friendly Community is "a city or town that has shown a commitment to improving and sustaining walkability and pedestrian safety through comprehensive programs, plans, and policies. Communities apply to the program to receive recognition in the form of a Bronze, Silver, Gold, or Platinum designation."

Vermont has two designated Walk Friendly Communities. Burlington[i] is designated silver level and Essex Junction[ii] is designated bronze level. In New Hampshire, Portsmouth[iii] has achieved silver level status. Click on each city/town's name to view their profiles and the justification for their designations.

Communities can apply on the organization's website at https://www.walkfriendly.org/communities/.

LAB Bike-Friendly States Scorecard

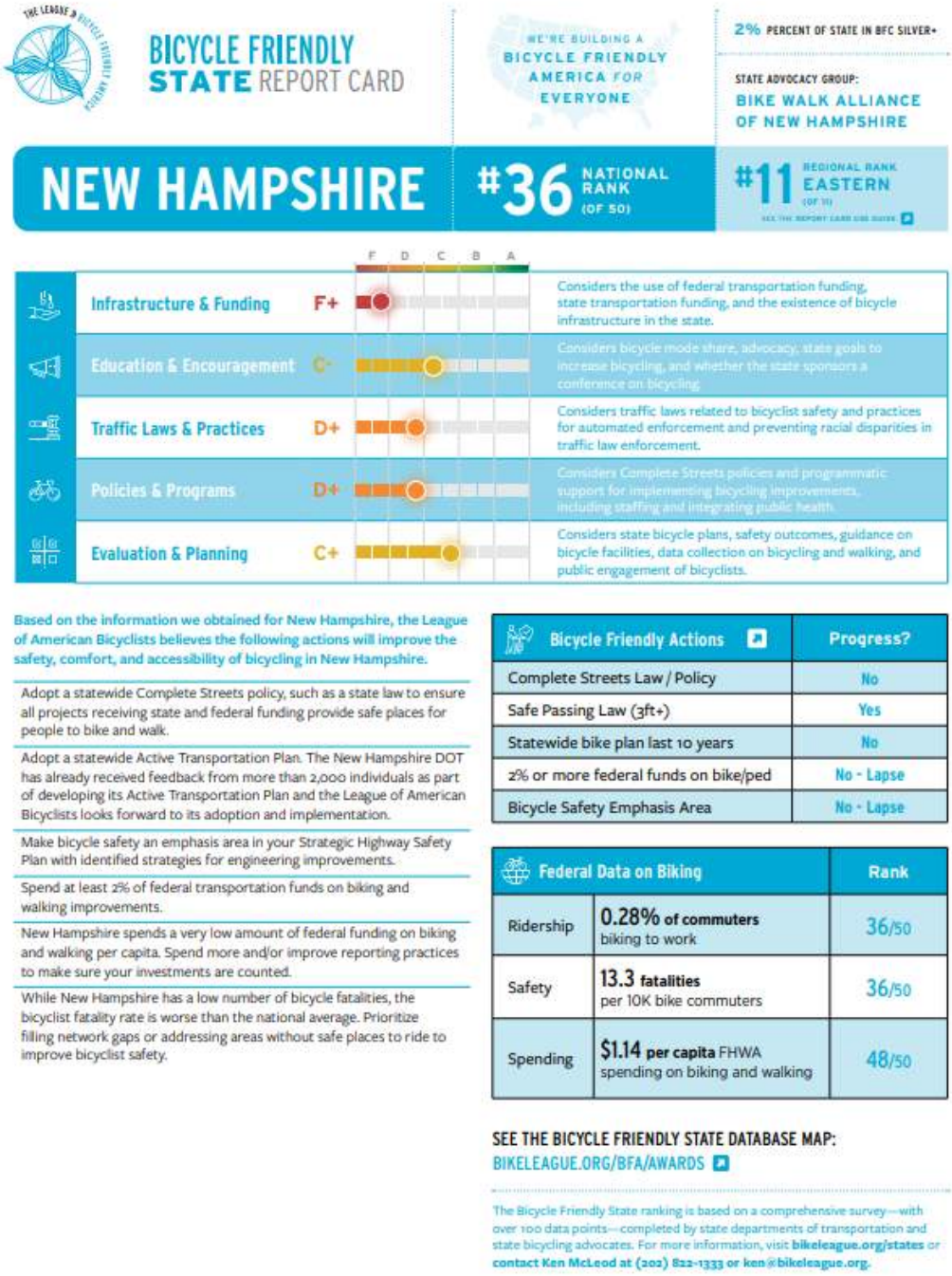
Scoring Explanation

Each state report card includes:

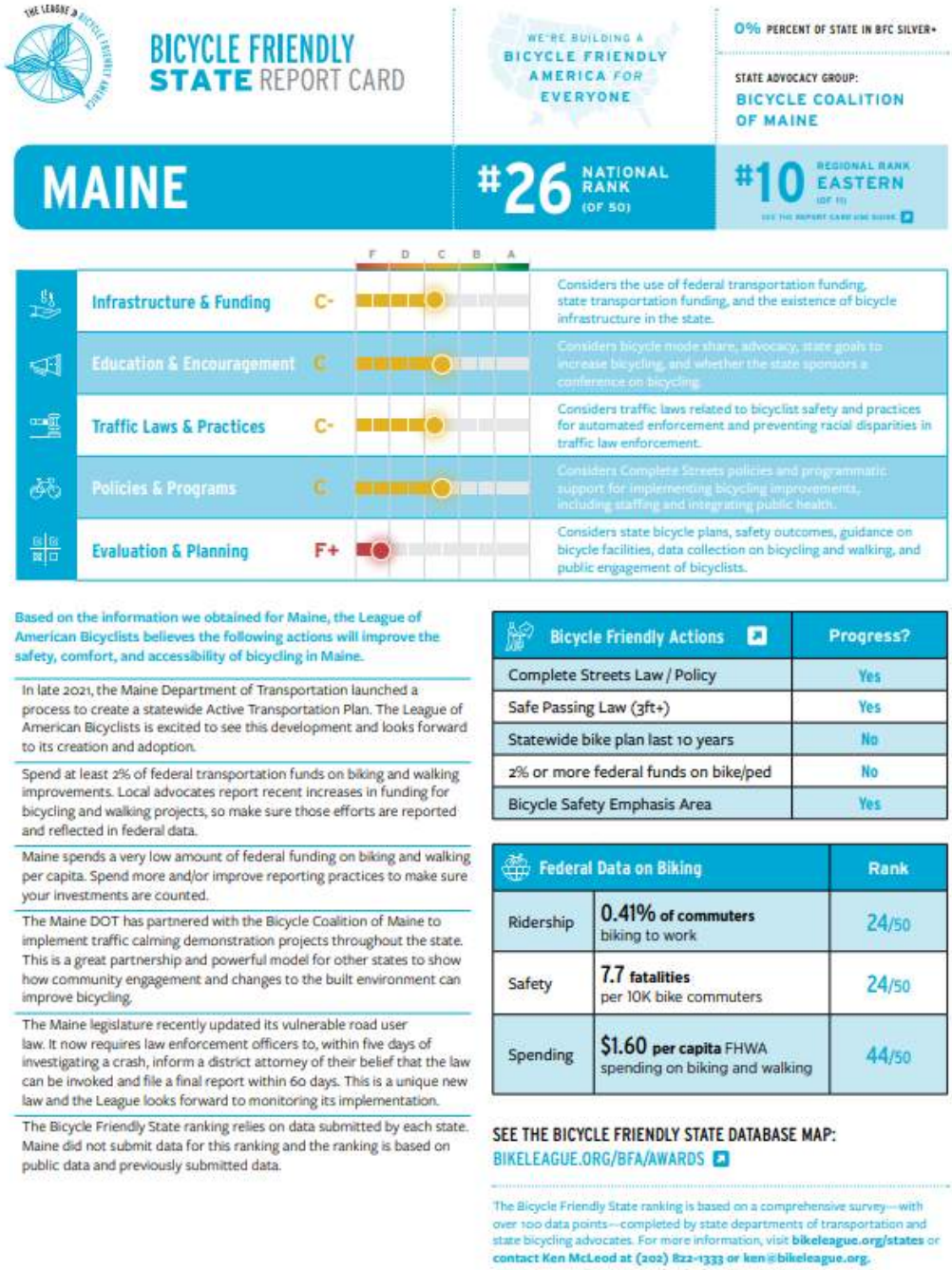
- Feedback based on survey data and suggestions from state advocates and agencies. This section recognizes progress made and important steps that can be taken by the state to improve bicycling.
- Our 5 Bicycle Friendly Actions and whether each state has taken them. Each of the 5 Bicycle Friendly Actions is an action that the League of American Bicyclists believes EVERY state should take.
- Federal data indicators on bicycle use, safety, and federal funding used for biking and walking. Although not ideal, this data is the best data that is available nationwide for state-by-state comparisons of current conditions.
- Grades for each of the 5 categories of questions in our Bicycle Friendly State survey and each sub-category in our survey. These grades are meant to help people identify areas for improvement in their state. The underlying questions can be found in the Bicycle Friendly State survey.

For more information, visit the League of American Bicyclists' website at https://bikeleague.org/content/state-report-cards.

New Hampshire LAB Report Card[iv]



Maine LAB Report Card[v]



BICYCLE FRIENDLY STATE REPORT CARD

WE'RE BUILDING A BICYCLE FRIENDLY AMERICA FOR EVERYONE

0% PERCENT OF STATE IN BFC SILVER+

STATE ADVOCACY GROUP: BICYCLE COALITION OF MAINE

MAINE

#26 NATIONAL RANK (OF 50)

#10 REGIONAL RANK EASTERN (OF 11)

		F D C B A	
Infrastructure & Funding	C-		Considers the use of federal transportation funding, state transportation funding, and the existence of bicycle infrastructure in the state.
Education & Encouragement	C		Considers bicycle mode share, advocacy, state goals to increase bicycling, and whether the state sponsors a conference on bicycling.
Traffic Laws & Practices	C-		Considers traffic laws related to bicyclist safety and practices for automated enforcement and preventing racial disparities in traffic law enforcement.
Policies & Programs	C		Considers Complete Streets policies and programmatic support for implementing bicycling improvements, including staffing and integrating public health.
Evaluation & Planning	F+		Considers state bicycle plans, safety outcomes, guidance on bicycle facilities, data collection on bicycling and walking, and public engagement of bicyclists.

Based on the information we obtained for Maine, the League of American Bicyclists believes the following actions will improve the safety, comfort, and accessibility of bicycling in Maine.

In late 2021, the Maine Department of Transportation launched a process to create a statewide Active Transportation Plan. The League of American Bicyclists is excited to see this development and looks forward to its creation and adoption.

Spend at least 2% of federal transportation funds on biking and walking improvements. Local advocates report recent increases in funding for bicycling and walking projects, so make sure those efforts are reported and reflected in federal data.

Maine spends a very low amount of federal funding on biking and walking per capita. Spend more and/or improve reporting practices to make sure your investments are counted.

The Maine DOT has partnered with the Bicycle Coalition of Maine to implement traffic calming demonstration projects throughout the state. This is a great partnership and powerful model for other states to show how community engagement and changes to the built environment can improve bicycling.

The Maine legislature recently updated its vulnerable road user law. It now requires law enforcement officers to, within five days of investigating a crash, inform a district attorney of their belief that the law can be invoked and file a final report within 60 days. This is a unique new law and the League looks forward to monitoring its implementation.

The Bicycle Friendly State ranking relies on data submitted by each state. Maine did not submit data for this ranking and the ranking is based on public data and previously submitted data.

Bicycle Friendly Actions	Progress?
Complete Streets Law / Policy	Yes
Safe Passing Law (3ft+)	Yes
Statewide bike plan last 10 years	No
2% or more federal funds on bike/ped	No
Bicycle Safety Emphasis Area	Yes

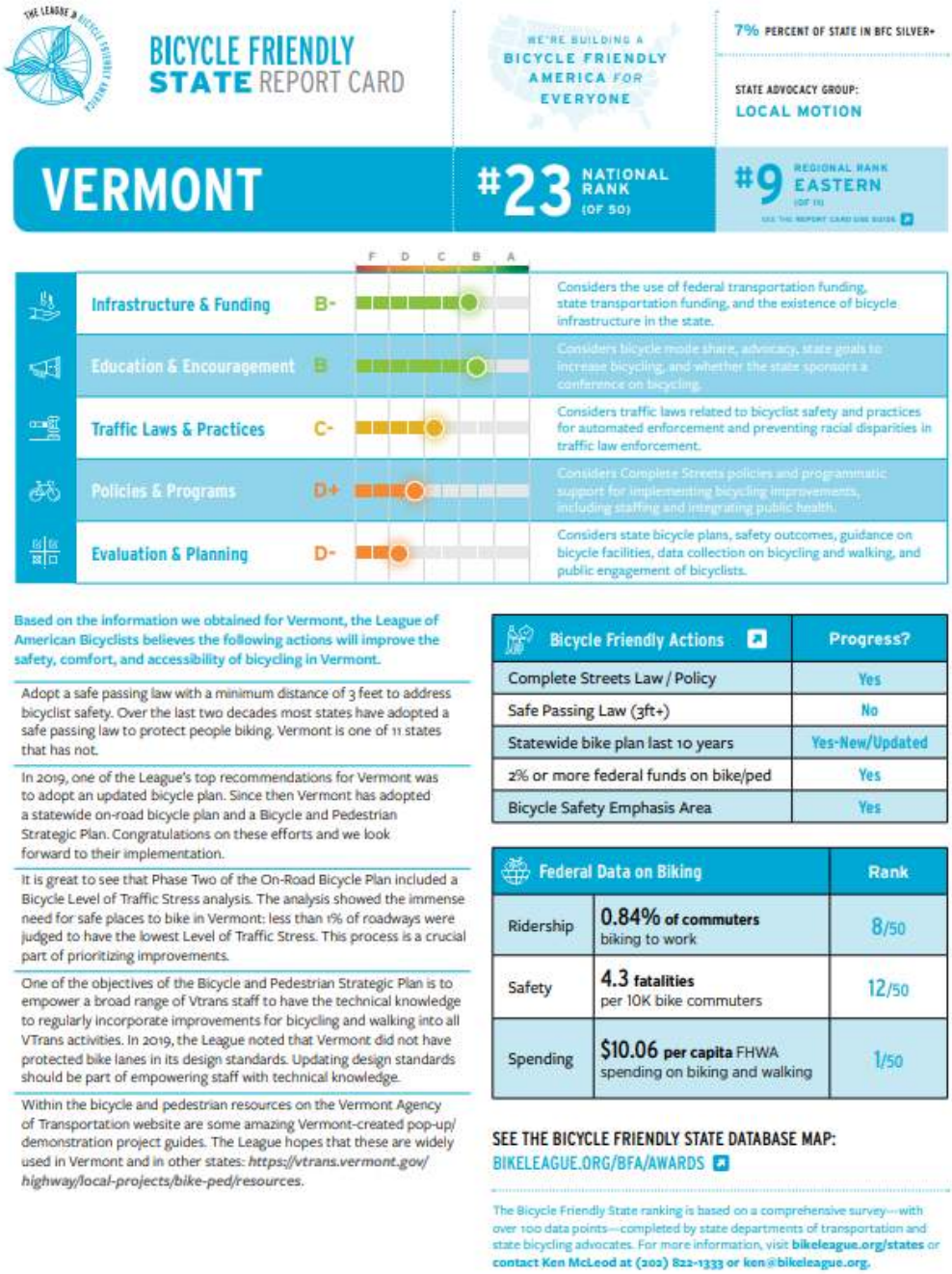
Federal Data on Biking		Rank
Ridership	**0.41%** of commuters biking to work	24/50
Safety	**7.7** fatalities per 10K bike commuters	24/50
Spending	**$1.60** per capita FHWA spending on biking and walking	44/50

SEE THE BICYCLE FRIENDLY STATE DATABASE MAP:
BIKELEAGUE.ORG/BFA/AWARDS

The Bicycle Friendly State ranking is based on a comprehensive survey—with over 100 data points—completed by state departments of transportation and state bicycling advocates. For more information, visit **bikeleague.org/states** or **contact Ken McLeod at (202) 822-1333 or ken@bikeleague.org.**

WE'RE BUILDING A BICYCLE FRIENDLY AMERICA FOR EVERYONE • BIKELEAGUE.ORG

[Vermont LAB Report Card](#)[vi]



BICYCLE FRIENDLY STATE REPORT CARD

WE'RE BUILDING A BICYCLE FRIENDLY AMERICA FOR EVERYONE

7% PERCENT OF STATE IN BFC SILVER+

STATE ADVOCACY GROUP: LOCAL MOTION

VERMONT

#23 NATIONAL RANK (OF 50)

#9 REGIONAL RANK EASTERN (OF 11)

SEE THE REPORT CARD SIDE GUIDE

	F D C B A	
Infrastructure & Funding	B-	Considers the use of federal transportation funding, state transportation funding, and the existence of bicycle infrastructure in the state.
Education & Encouragement	B	Considers bicycle mode share, advocacy, state goals to increase bicycling, and whether the state sponsors a conference on bicycling.
Traffic Laws & Practices	C-	Considers traffic laws related to bicyclist safety and practices for automated enforcement and preventing racial disparities in traffic law enforcement.
Policies & Programs	D+	Considers Complete Streets policies and programmatic support for implementing bicycling improvements, including staffing and integrating public health.
Evaluation & Planning	D-	Considers state bicycle plans, safety outcomes, guidance on bicycle facilities, data collection on bicycling and walking, and public engagement of bicyclists.

Based on the information we obtained for Vermont, the League of American Bicyclists believes the following actions will improve the safety, comfort, and accessibility of bicycling in Vermont.

Adopt a safe passing law with a minimum distance of 3 feet to address bicyclist safety. Over the last two decades most states have adopted a safe passing law to protect people biking. Vermont is one of 11 states that has not.

In 2019, one of the League's top recommendations for Vermont was to adopt an updated bicycle plan. Since then Vermont has adopted a statewide on-road bicycle plan and a Bicycle and Pedestrian Strategic Plan. Congratulations on these efforts and we look forward to their implementation.

It is great to see that Phase Two of the On-Road Bicycle Plan included a Bicycle Level of Traffic Stress analysis. The analysis showed the immense need for safe places to bike in Vermont: less than 1% of roadways were judged to have the lowest Level of Traffic Stress. This process is a crucial part of prioritizing improvements.

One of the objectives of the Bicycle and Pedestrian Strategic Plan is to empower a broad range of Vtrans staff to have the technical knowledge to regularly incorporate improvements for bicycling and walking into all VTrans activities. In 2019, the League noted that Vermont did not have protected bike lanes in its design standards. Updating design standards should be part of empowering staff with technical knowledge.

Within the bicycle and pedestrian resources on the Vermont Agency of Transportation website are some amazing Vermont-created pop-up/demonstration project guides. The League hopes that these are widely used in Vermont and in other states: *https://vtrans.vermont.gov/highway/local-projects/bike-ped/resources*.

Bicycle Friendly Actions	Progress?
Complete Streets Law / Policy	Yes
Safe Passing Law (3ft+)	No
Statewide bike plan last 10 years	Yes-New/Updated
2% or more federal funds on bike/ped	Yes
Bicycle Safety Emphasis Area	Yes

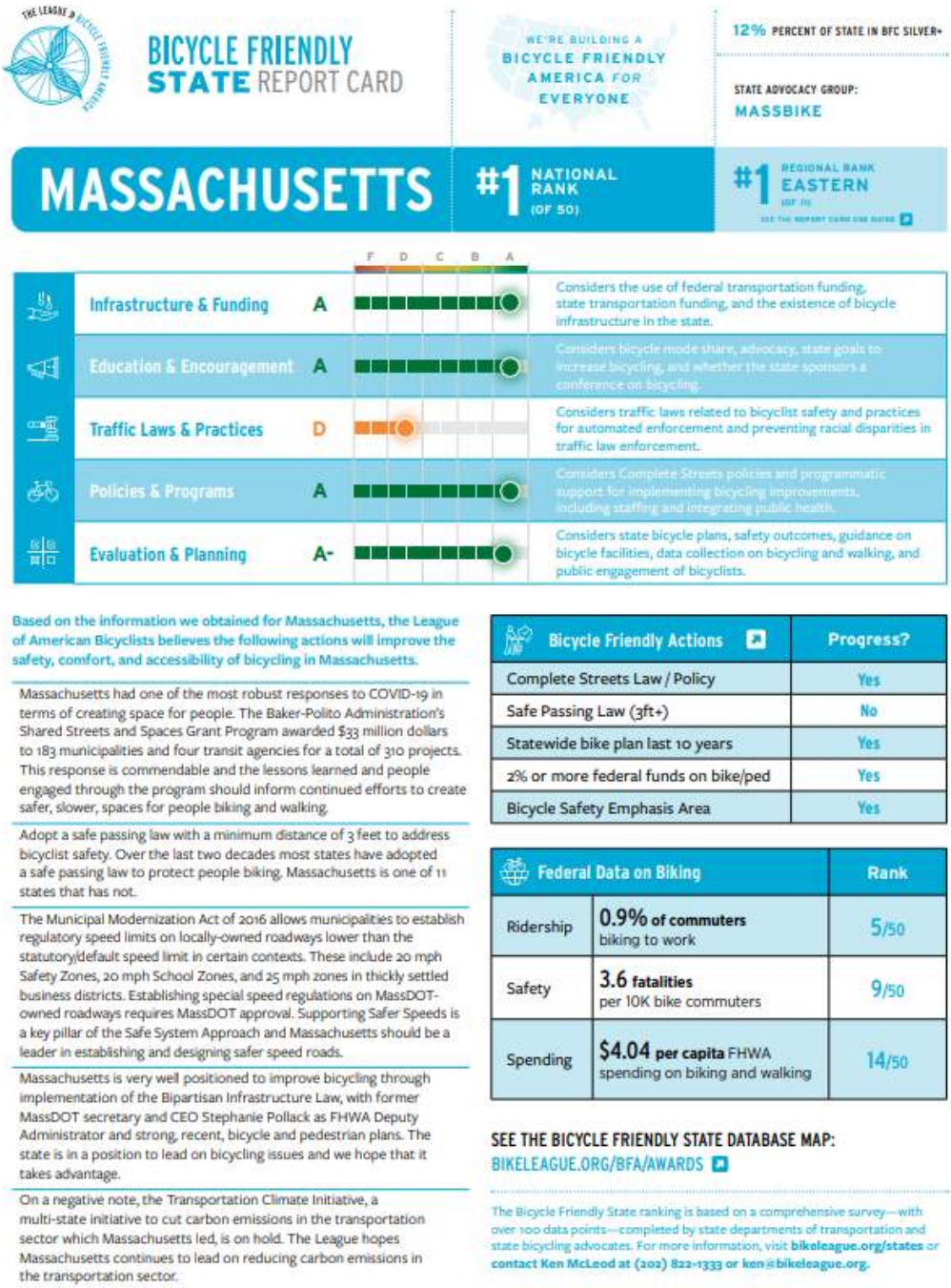
Federal Data on Biking		Rank
Ridership	**0.84% of commuters** biking to work	8/50
Safety	**4.3 fatalities** per 10K bike commuters	12/50
Spending	**$10.06 per capita** FHWA spending on biking and walking	1/50

SEE THE BICYCLE FRIENDLY STATE DATABASE MAP:
BIKELEAGUE.ORG/BFA/AWARDS

The Bicycle Friendly State ranking is based on a comprehensive survey—with over 100 data points—completed by state departments of transportation and state bicycling advocates. For more information, visit **bikeleague.org/states** or **contact Ken McLeod at (202) 822-1333 or ken@bikeleague.org.**

WE'RE BUILDING A BICYCLE FRIENDLY AMERICA FOR EVERYONE • BIKELEAGUE.ORG

Massachusetts LAB report card[vii]



BICYCLE FRIENDLY STATE REPORT CARD

WE'RE BUILDING A BICYCLE FRIENDLY AMERICA FOR EVERYONE

12% PERCENT OF STATE IN BFC SILVER+

STATE ADVOCACY GROUP: MASSBIKE

MASSACHUSETTS

#1 NATIONAL RANK (OF 50)

#1 REGIONAL RANK EASTERN (OF 11)

SEE THE REPORT CARD USE GUIDE

	F D C B A	
Infrastructure & Funding	A	Considers the use of federal transportation funding, state transportation funding, and the existence of bicycle infrastructure in the state.
Education & Encouragement	A	Considers bicycle mode share, advocacy, state goals to increase bicycling, and whether the state sponsors a conference on bicycling.
Traffic Laws & Practices	D	Considers traffic laws related to bicyclist safety and practices for automated enforcement and preventing racial disparities in traffic law enforcement.
Policies & Programs	A	Considers Complete Streets policies and programmatic support for implementing bicycling improvements, including staffing and integrating public health.
Evaluation & Planning	A-	Considers state bicycle plans, safety outcomes, guidance on bicycle facilities, data collection on bicycling and walking, and public engagement of bicyclists.

Based on the information we obtained for Massachusetts, the League of American Bicyclists believes the following actions will improve the safety, comfort, and accessibility of bicycling in Massachusetts.

Massachusetts had one of the most robust responses to COVID-19 in terms of creating space for people. The Baker-Polito Administration's Shared Streets and Spaces Grant Program awarded $33 million dollars to 183 municipalities and four transit agencies for a total of 310 projects. This response is commendable and the lessons learned and people engaged through the program should inform continued efforts to create safer, slower, spaces for people biking and walking.

Adopt a safe passing law with a minimum distance of 3 feet to address bicyclist safety. Over the last two decades most states have adopted a safe passing law to protect people biking. Massachusetts is one of 11 states that has not.

The Municipal Modernization Act of 2016 allows municipalities to establish regulatory speed limits on locally-owned roadways lower than the statutory/default speed limit in certain contexts. These include 20 mph Safety Zones, 20 mph School Zones, and 25 mph zones in thickly settled business districts. Establishing special speed regulations on MassDOT-owned roadways requires MassDOT approval. Supporting Safer Speeds is a key pillar of the Safe System Approach and Massachusetts should be a leader in establishing and designing safer speed roads.

Massachusetts is very well positioned to improve bicycling through implementation of the Bipartisan Infrastructure Law, with former MassDOT secretary and CEO Stephanie Pollack as FHWA Deputy Administrator and strong, recent, bicycle and pedestrian plans. The state is in a position to lead on bicycling issues and we hope that it takes advantage.

On a negative note, the Transportation Climate Initiative, a multi-state initiative to cut carbon emissions in the transportation sector which Massachusetts led, is on hold. The League hopes Massachusetts continues to lead on reducing carbon emissions in the transportation sector.

Bicycle Friendly Actions	Progress?
Complete Streets Law / Policy	Yes
Safe Passing Law (3ft+)	No
Statewide bike plan last 10 years	Yes
2% or more federal funds on bike/ped	Yes
Bicycle Safety Emphasis Area	Yes

Federal Data on Biking		Rank
Ridership	**0.9%** of commuters biking to work	5/50
Safety	**3.6** fatalities per 10K bike commuters	9/50
Spending	**$4.04** per capita FHWA spending on biking and walking	14/50

SEE THE BICYCLE FRIENDLY STATE DATABASE MAP:
BIKELEAGUE.ORG/BFA/AWARDS

The Bicycle Friendly State ranking is based on a comprehensive survey—with over 100 data points—completed by state departments of transportation and state bicycling advocates. For more information, visit **bikeleague.org/states** or **contact Ken McLeod at (202) 822-1333 or ken@bikeleague.org.**

WE'RE BUILDING A BICYCLE FRIENDLY AMERICA FOR EVERYONE • BIKELEAGUE.ORG

Safe Routes Partnership Scorecards

The Safe Routes Partnership develop state report cards based on "how supportive each state is of walking, bicycling, and physical activity for children and adults as of 2022."

The report cards are based on state policy achievements in four areas: Complete Streets and Active Transportation Policy and Planning, Federal and State Active Transportation Funding, Safe Routes to School Funding and Supportive Practices, and Active Neighborhoods and Schools. For more information, visit the organization's website at https://www.saferoutespartnership.org/resources/2022-state-report-map.

The report cards appear on the following pages, and also at these links: New Hampshire,[viii] Maine,[ix] Vermont,[x] Massachusetts.[xi]

New Hampshire 2022

LACING UP

OVERALL SCORE

23 / 200

Scoring Key: LACING UP | WARMING UP | MAKING STRIDES | BUILDING SPEED

COMPLETE STREETS AND ACTIVE TRANSPORTATION POLICY AND PLANNING

Complete Streets Policies	Adopted state Complete Streets policy(ies)	0 / 5
	Has strong state Complete Streets policy	0 / 20
Active Transportation Goals and Planning	Adopted goals to increase walking and bicycling mode share	0 / 5
	Adopted a state pedestrian, bicycle, or active transportation plan	0 / 10
		0 / 40

FEDERAL AND STATE ACTIVE TRANSPORTATION FUNDING

Use of Federal Funding for Active Transportation	Retained TAP funding without transfers	-10 /10
	Awarded TAP projects	10 /10
	Obligated state-controlled TAP funds	8 /10
	Provides special consideration for high-need communities in TAP awards	0 / 5
	Provides matching funds for high-need communities	0 / 5
	Provides support to TAP applicants	5 / 5
	Sets aside other federal (non-TAP) funding for active transportation	0 / 5
State Funding for Active Transportation	Dedicates state funding for active transportation	0 /10
	Amount of state funding for active transportation	0 /10
	Provides special consideration for high-need communities in state awards	0 / 5
		13 /75

SAFE ROUTES TO SCHOOL FUNDING AND SUPPORTIVE PRACTICES

Safe Routes to School Funding	Provides special consideration for Safe Routes to School projects using TAP funds	0 / 5
	Dedicates state or other funding for Safe Routes to School	0 / 5
	Funds SRTS non-infrastructure projects	0 / 5
	Provides Safe Routes to School planning grants or minigrants	0 / 3
Safe Routes to School Supportive Practices	Staffs state Safe Routes to School program with state employees or consultants	1 / 5
	Provides a resource center or technical assistance to Safe Routes to School initiatives	0 / 7
	Adopted a state SRTS plan or incorporated SRTS into a state active transportation plan	0 / 5
	Supports equitable access to Safe Routes to School programming	0 / 5
		1 /40

ACTIVE NEIGHBORHOODS AND SCHOOLS

Shared Use of School Facilities	Adopted state policy supporting shared use of school facilities	6 /10
	Provides funding/incentives in support of shared use of school facilities	0 / 5
School Siting and Design	Requires large school sites (minimum acreage guideline)	0 / 0
	Supports walking, bicycling and physical activity in school design guidelines	0 /15
Physical Education	Adopted PE minutes and graduation requirements	3 /15
		9 /45

To review a quick summary of the report cards' scoring structure, click here: **Understanding the Scores and Grading**

Maine 2022

MAKING STRIDES

OVERALL SCORE
114 / 200

Scoring Key: LACING UP | WARMING UP | MAKING STRIDES | BUILDING SPEED

COMPLETE STREETS AND ACTIVE TRANSPORTATION POLICY AND PLANNING

Complete Streets Policies	Adopted state Complete Streets policy(ies)	3 / 5
	Has strong state Complete Streets policy	12 / 20
Active Transportation Goals and Planning	Adopted goals to increase walking and bicycling mode share	0 / 5
	Adopted a state pedestrian, bicycle, or active transportation plan	0 / 10
		15 / 40

FEDERAL AND STATE ACTIVE TRANSPORTATION FUNDING

Use of Federal Funding for Active Transportation	Retained TAP funding without transfers	10 /10
	Awarded TAP projects	10 /10
	Obligated state-controlled TAP funds	6 /10
	Provides special consideration for high-need communities in TAP awards	5 / 5
	Provides matching funds for high-need communities	5 / 5
	Provides support to TAP applicants	5 / 5
	Sets aside other federal (non-TAP) funding for active transportation	5 / 5
State Funding for Active Transportation	Dedicates state funding for active transportation	10 /10
	Amount of state funding for active transportation	3 /10
	Provides special consideration for high-need communities in state awards	0 / 5
		59 /75

SAFE ROUTES TO SCHOOL FUNDING AND SUPPORTIVE PRACTICES

Safe Routes to School Funding	Provides special consideration for Safe Routes to School projects using TAP funds	3 / 5
	Dedicates state or other funding for Safe Routes to School	3 / 5
	Funds SRTS non-infrastructure projects	0 / 5
	Provides Safe Routes to School planning grants or minigrants	3 / 3
Safe Routes to School Supportive Practices	Staffs state Safe Routes to School program with state employees or consultants	3 / 5
	Provides a resource center or technical assistance to Safe Routes to School initiatives	7 / 7
	Adopted a state SRTS plan or incorporated SRTS into a state active transportation plan	0 / 5
	Supports equitable access to Safe Routes to School programming	0 / 5
		19 /40

ACTIVE NEIGHBORHOODS AND SCHOOLS

Shared Use of School Facilities	Adopted state policy supporting shared use of school facilities	6 /10
	Provides funding/incentives in support of shared use of school facilities	0 / 5
School Siting and Design	Requires large school sites (minimum acreage guideline)	0 / 0
	Supports walking, bicycling and physical activity in school design guidelines	12 /15
Physical Education	Adopted PE minutes and graduation requirements	3 /15
		21 /45

To review a quick summary of the report cards' scoring structure, click here: **Understanding the Scores and Grading**

Massachusetts 2022

BUILDING SPEED

OVERALL SCORE
164 / 200

Scoring Key: LACING UP | WARMING UP | MAKING STRIDES | BUILDING SPEED

COMPLETE STREETS AND ACTIVE TRANSPORTATION POLICY AND PLANNING

Complete Streets Policies	Adopted state Complete Streets policy(ies)	5 / 5
	Has strong state Complete Streets policy	19 / 20
Active Transportation Goals and Planning	Adopted goals to increase walking and bicycling mode share	5 / 5
	Adopted a state pedestrian, bicycle, or active transportation plan	10 / 10
		39 / 40

FEDERAL AND STATE ACTIVE TRANSPORTATION FUNDING

Use of Federal Funding for Active Transportation	Retained TAP funding without transfers	5 /10
	Awarded TAP projects	10 /10
	Obligated state-controlled TAP funds	10 /10
	Provides special consideration for high-need communities in TAP awards	5 / 5
	Provides matching funds for high-need communities	5 / 5
	Provides support to TAP applicants	5 / 5
	Sets aside other federal (non-TAP) funding for active transportation	5 / 5
State Funding for Active Transportation	Dedicates state funding for active transportation	10 /10
	Amount of state funding for active transportation	10 /10
	Provides special consideration for high-need communities in state awards	5 / 5
		70 /75

SAFE ROUTES TO SCHOOL FUNDING AND SUPPORTIVE PRACTICES

Safe Routes to School Funding	Provides special consideration for Safe Routes to School projects using TAP funds	5 / 5
	Dedicates state or other funding for Safe Routes to School	5 / 5
	Funds SRTS non-infrastructure projects	3 / 5
	Provides Safe Routes to School planning grants or minigrants	2 / 3
Safe Routes to School Supportive Practices	Staffs state Safe Routes to School program with state employees or consultants	5 / 5
	Provides a resource center or technical assistance to Safe Routes to School initiatives	7 / 7
	Adopted a state SRTS plan or incorporated SRTS into a state active transportation plan	5 / 5
	Supports equitable access to Safe Routes to School programming	5 / 5
		37 /40

ACTIVE NEIGHBORHOODS AND SCHOOLS

Shared Use of School Facilities	Adopted state policy supporting shared use of school facilities	6 /10
	Provides funding/incentives in support of shared use of school facilities	0 / 5
School Siting and Design	Requires large school sites (minimum acreage guideline)	0 / 0
	Supports walking, bicycling and physical activity in school design guidelines	12 /15
Physical Education	Adopted PE minutes and graduation requirements	0 /15
		18 /45

To review a quick summary of the report cards' scoring structure, click here: **Understanding the Scores and Grading**

OVERALL SCORE

23 / 200

Vermont 2022

WARMING UP

OVERALL SCORE

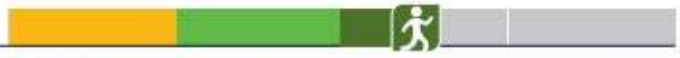
94 / 200

Scoring Key: LACING UP | WARMING UP | MAKING STRIDES | BUILDING SPEED 100%

COMPLETE STREETS AND ACTIVE TRANSPORTATION POLICY AND PLANNING

Complete Streets Policies	Adopted state Complete Streets policy(ies)	4 / 5
	Has strong state Complete Streets policy	8 / 20
Active Transportation Goals and Planning	Adopted goals to increase walking and bicycling mode share	0 / 5
	Adopted a state pedestrian, bicycle, or active transportation plan	10 / 10
		22 / 40

FEDERAL AND STATE ACTIVE TRANSPORTATION FUNDING



Use of Federal Funding for Active Transportation	Retained TAP funding without transfers	5 /10
	Awarded TAP projects	10 /10
	Obligated state-controlled TAP funds	6 /10
	Provides special consideration for high-need communities in TAP awards	0 / 5
	Provides matching funds for high-need communities	0 / 5
	Provides support to TAP applicants	5 / 5
	Sets aside other federal (non-TAP) funding for active transportation	0 / 5
State Funding for Active Transportation	Dedicates state funding for active transportation	10 /10
	Amount of state funding for active transportation	7 /10
	Provides special consideration for high-need communities in state awards	5 / 5
		48 /75

SAFE ROUTES TO SCHOOL FUNDING AND SUPPORTIVE PRACTICES

Safe Routes to School Funding	Provides special consideration for Safe Routes to School projects using TAP funds	3 / 5
	Dedicates state or other funding for Safe Routes to School	0 / 5
	Funds SRTS non-infrastructure projects	3 / 5
	Provides Safe Routes to School planning grants or minigrants	0 / 3
Safe Routes to School Supportive Practices	Staffs state Safe Routes to School program with state employees or consultants	3 / 5
	Provides a resource center or technical assistance to Safe Routes to School initiatives	7 / 7
	Adopted a state SRTS plan or incorporated SRTS into a state active transportation plan	2 / 5
	Supports equitable access to Safe Routes to School programming	0 / 5
		18 /40

ACTIVE NEIGHBORHOODS AND SCHOOLS

Shared Use of School Facilities	Adopted state policy supporting shared use of school facilities	0 /10
	Provides funding/incentives in support of shared use of school facilities	0 / 5
School Siting and Design	Requires large school sites (minimum acreage guideline)	0 / 0
	Supports walking, bicycling and physical activity in school design guidelines	3 /15
Physical Education	Adopted PE minutes and graduation requirements	3 /15
		6 /45

To review a quick summary of the report cards' scoring structure, click here: **Understanding the Scores and Grading**

[i] https://www.walkfriendly.org/communities/burlington-vt/

[ii] https://www.walkfriendly.org/communities/essex-junction-vt/

[iii] https://www.walkfriendly.org/communities/portsmouth-nh/

[iv] https://bikeleague.org/wp-content/uploads/bfareportcards/bfs/2022/new_hampshire.pdf

[v] https://bikeleague.org/wp-content/uploads/bfareportcards/bfs/2022/maine.pdf

[vi] https://bikeleague.org/wp-content/uploads/bfareportcards/bfs/2022/vermont.pdf

[vii] https://bikeleague.org/wp-content/uploads/bfareportcards/bfs/2022/massachusetts.pdf

[viii] https://www.saferoutespartnership.org/sites/default/files/srp-report-card-2022/srp-report-card-2022-new-hampshire.pdf

[ix] https://www.saferoutespartnership.org/sites/default/files/srp-report-card-2022/srp-report-card-2022-maine.pdf

[x] https://www.saferoutespartnership.org/sites/default/files/srp-report-card-2022/srp-report-card-2022-vermont.pdf

[xi] https://www.saferoutespartnership.org/sites/default/files/srp-report-card-2022/srp-report-card-2022-massachusetts.pdf