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New Hampshire DOT Statewide Pedestrian & Bicycle Transportation Plan and Economic Impact Study

Technical Memorandum #1

Existing Conditions Assessment

PREPARED FOR

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Existing Conditions Assessment

Technical Memorandum #1 provides an overview of existing walking and bicycling conditions in New Hampshire. The memo includes an introduction to demographic trends, the benefits of walking and bicycling, a summary of current pedestrian and bicycle facility typologies in use, and a series of existing-conditions and analysis maps for the state. It concludes with a Vision for walking and bicycling in New Hampshire, the Goals for the Plan and the Objectives that will help the state reach its goals.

1.1 Introduction

The New Hampshire Statewide Pedestrian and Bicycle Transportation Plan and Economic Impact Study (Plan) will identify current and future desired conditions for walking and bicycling in New Hampshire. It will serve as a guide for state agencies, regional planning commissions, municipalities, and advocacy groups to work together to provide a transportation system that safely accommodates pedestrians[1] and bicyclists in a coordinated and holistic manner. The Plan will be an action-oriented document designed to help bridge the gap between current conditions and what residents and visitors envision for a safer, more comfortable, and better-connected pedestrian and bicycling facilities, and the policies and programs that support them. This is New Hampshire's first statewide pedestrian and bicycle transportation plan since 2000, and aims to enhance walking and bicycling safety in the state.

When complete, the Plan will consist of the following chapters:

- **Chapter 1 – Existing Conditions and Analysis.** Chapter 1 provides an overview of existing conditions for walking and bicycling throughout the state. It will include analyses related to system connectivity, equity, safety hot spots and level of traffic stress for bicyclists.

- **Chapter 2 – Vision, Goals and Objectives.** Based on the public input received through the online survey and interactive mapping tools at https://nhpedbikeplan.com/, eight statewide public meetings and Regional Planning Commission "Meetings in a Box", this chapter will provide the Vision for walking and bicycling in the state and the supporting goals and objectives to help New Hampshire achieve the Vision.

- **Chapter 3 – Policies and Programs.** Chapter 3 provides an overview of existing NHDOT policies and programs that provide, enable and promote walking and bicycling in New Hampshire. New policies and programs and revisions to existing ones are included to further enhance pedestrian and bicycle safety and accessibility.

[1] - For the purposes of this study, pedestrians include walkers, runners, people with disabilities and transit passengers (even those that accessed the bus or train via a park-and-ride facility).

- **Chapter 4 – Creating a Walking and Bicycling Network.** This chapter articulates pedestrian and bicycle-related facility project needs in order to form an integrated network for safer walking and bicycling. Broken down by each geographic region of the state, project recommendations will be evaluated and scored so that the many projects are prioritized in a logical manner.

- **Chapter 5 – The Economic Impact of Walking and Bicycling.** Chapter 5 provides an analysis of the economic impact of improving pedestrian and bicycle facilities on state highways and identifies potential funding sources of capital, maintenance and operating costs. The impacts will be assessed based on the changes to property values, increased business activity, and higher levels of bicycle tourism.

- **Chapter 6 – What are the next steps?** This chapter focuses on implementation strategies (projects, timeline, other action steps) to allow the Plan to come to fruition. It will include a phased approach to policies and projects that will make the state more walkable and bikable.

1.2 The Benefits of Walking and Bicycling

The Plan's policy and infrastructure recommendations will bring significant benefits for the State of New Hampshire and for residents, employees and visitors in all corners of the state. These include:

Transportation Benefits

- 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, or temporary impairment, and for those who do not wish to use a car
- Appropriate pedestrian and bicycle accessibility minimizes traffic conflicts between the various modes that travel at significantly different speeds
- Per the 2009 National Household Travel Survey, 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 Benefits

- Improved pedestrian and bicycle facilities have led to increased number of walkers and bicyclists and decreased number of crashes, injuries and fatalities through the "safety in numbers" effect, due to an enhanced awareness of vulnerable users by motorists[2]

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

- Roads with appropriate pedestrian facilities[3] can reduce crashes involving pedestrians by up to 50% (see footnotes 3 and 4 at bottom and bullets immediately below)[4]
- According to the Federal Highway Administration's Desktop Reference for Crash Reduction Factors providing[5]:
    - 3-7 second, Leading Pedestrian Intervals (LPI) at signalized intersections reduce pedestrian-vehicle crashes by 60%
    - pedestrian refuge islands reduce pedestrian-vehicle crashes by 56% at marked crosswalks
    - sidewalks along roadways reduce pedestrian-vehicle crashes by 65-89%, while paved shoulders wide enough for walking and bicycling reduce crashes by 71%

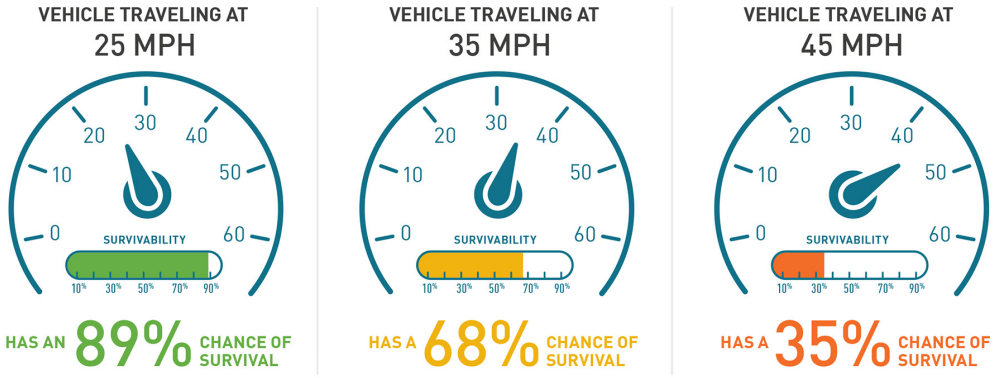
Pedestrian refuge islands on busy roadways can improve pedestrian safety

- Pedestrian and bicycle infrastructure improvements, where appropriate—e.g. bicycle lanes, on-street parking with bump outs and median islands—help to moderate traffic speeds, reducing the severity of crashes (see graphic below)

[3] 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*

[4] 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*

[5] https://safety.fhwa.dot.gov/provencountermeasures/



Tefft, B. C. *Impact speed and a pedestrian's risk of severe injury or death*. Accident Analysis & Prevention 50 (2013) 871-878.

Economic Benefits

- Studies have shown that in some parts of the U.S., pedestrians and bicyclists make more frequent trips and spend more money overall, per month[6]
- When new separated bike lanes were added to Broadway in Salt Lake City, retail sales the following year went up 8%, despite the 30% reduction in on-street parking; over 80% of business owners were supportive or neutral about the new bike lanes and other streetscape improvements[7]
- Vermont's trail network generated nearly $30 million in economic impact from out-of-state visitors by creating strong demand for hotels, restaurants, cafes and ice cream shops[8]

Health Benefits

- Walking and bicycling provide an opportunity for people to integrate into their daily lives the recommended 150 minutes of weekly aerobic activity, recommended in 2015 by the Centers for Disease Control for improved health
- Walking and bicycling have a net benefit for an individual's health; a study from the Netherlands found the health benefits of bicycling outweighed the risks by a 9:1 ratio[9]
- According to the North Carolina Medical Journal, for every $1 spent on shared-use paths and trails, there is a $3 long-term cost savings in direct medical expenses for users[10]

[6] 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

[7] Anderson, Michael, (October 2015), "SLC Street Remove Parking, Adds Bike Lanes and Sales Go Up.", People for Bikes blog

[8] Rogers, Shannon, (December 2018), "Nature Economy: The Economic Benefits of Trails." UNH Extension Program Fact Sheet #1

[9] De Hartog, Jeroen Johan et al, (2011), "Do the health benefits of cycling outweigh the risks?", Institute for Risk Assessment Sciences, University of Utrecht NL

[10] Chenoweth, David (2012), "Economics, Physical Activity, and Community Design." North Carolina Medical Journal 73(4): 293-294.

- Compared to most other modes of transportation, walking and bicycling have far fewer negative environmental impacts

1.3 The State of Walking and Bicycling in New Hampshire

The State of New Hampshire contains diverse regions that range from dense urban centers, to rural areas containing homes, farms, and wooded areas. Between city and country are a variety of contexts that include historic towns and villages, post-War suburban housing tracts, and resort-style communities near the seacoast, lakes, and mountains that rely heavily on tourism for their lifeblood. The walkability of many cities and towns in New Hampshire is tied directly to the era in which the surrounding contexts were developed. The centers of many municipalities established and built-out prior to the early 20th century typically contain sidewalks on both sides of two-lane streets with crosswalks at some intersections. Many commercial areas contain a mix of uses and at least a modest level of density to encourage walking between destinations. Older residential neighborhoods typically feature sidewalks along tree-lined streets that form a network, providing a comfortable walking environment that minimizes out-of-direction travel. Residential neighborhoods and commercial areas built in the past 60-70 years, however, cater primarily to automobile transportation and parking. This has come at the detriment of walking as these districts feature wide roads and busy intersections at the expense of walkability as roads servicing these areas have been designed to accommodate large motor vehicle traffic volumes, high speed travel, dispersed destinations and minimal—if any—sidewalks and other pedestrian facilities.

The bikeability of many New Hampshire communities also typically corresponds with the era in which it was developed, along with the presence of rail trails within the town or city's boundaries. Although not all historic communities are bike-friendly, all bike-friendly communities include historic downtowns and neighborhoods that are more conducive to both walking and bicycling. Currently, the most bikeable places in New Hampshire are relatively compact and feature local policies that promote bicycling through new infrastructure and programs. Designated as official "bike-friendly communities", five cities and towns have been recognized 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.

New Hampshire's Bicycle Friendly Communities

Keene (Silver)
Concord (Bronze)
Hanover (Bronze)
Lebanon (Bronze)
Portsmouth (Bronze)

State and local highways connect most towns and cities and offer an inconsistent mix of wide shoulders and/or relatively-low traffic speeds and volumes that provide pedestrian and bicycle accessibility. While in the past, most attention to bicycling has occurred within municipal boundaries or on rail-trails, providing more bike-friendly links between communities will be a focus of the New Hampshire Pedestrian and Bicycle Transportation Plan. The range of contexts found throughout the state generates demand for both shorter, utilitarian trips and for longer recreational trips.

1.3.1 Geography and Demographics

Although much of the state is covered in forests and farms, New Hampshire's urban areas can be quite conducive to walking and bicycling. A number of cities and towns are compact and, with improved pedestrian and bicycle facilities and programs, offer the opportunity to replace many short automobile trips with walking and bicycle trips. Much of the state's landscape, including the Seacoast, the Lakes Region, the North Country, and Monadnock Region are remarkably scenic and provide opportunities to promote additional recreational riding and bicycle tourism as well.

Lebanon Street/NH 120 in Hanover is a multimodal corridor with provisions for walking and bicycling

Roughly 527,000 households currently exist in the state, according to the American Community Survey (ACS)[11]. The median age of New Hampshire residents is 42.7 years old, and 23.2% are age 65 or older[12]. Many have a limited ability to drive due to a disability or have made the choice to not drive for lifestyle reasons. Along with travelers under the age of 16.5, those who cannot afford to own and maintain an automobile, and those who have temporarily lost driving privileges, some proportion of the state's residents do not or cannot drive at any given moment. This highlights the need for improved transit, and walking and bicycling facilities to accommodate the mobility needs for these residents.

The American Community Survey asks respondents questions about their race and ethnicity. In New Hampshire, non-white residents make up 6.6% of the population, including 1.4% who have self-identified as exclusively Black or African-American, 2.5% as exclusively Asian, and 2.7% as American Indian, some other race or a mix of races[13]. Also, 3.4% of the state population is identified as Hispanic or Latino, though both terms are considered an ethnic origin, not a race[14].

Overall, 8.1% of New Hampshire residents live below the poverty line, including 13.3% of self-identified non-white populations, and 18.4% of Hispanic or Latino populations[15]. Lower-income (and minority) communities are typically more dependent on ways to access jobs and services without use of a private automobile. As such, further analysis will be conducted to better-understand where low-income and non-English speaking populations live in order to plan for an equitable distribution of recommended facilities for walking and bicycling.

[11] FactFinder, American Community Survey, Table B08201: Household Size by Vehicles Available, 2013-2017 5-Year Estimates.

[12] FactFinder, American Community Survey, Table S0101: Age and Sex, 2013-2017 5-Year Estimates.

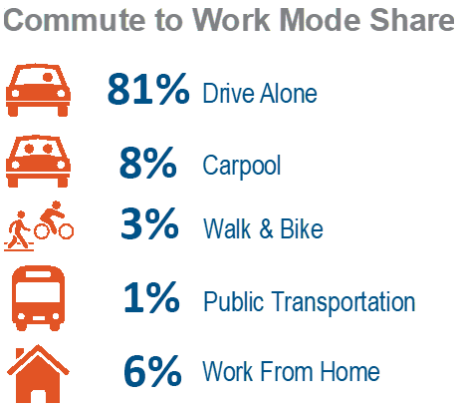
[13] FactFinder, American Community Survey, Table B02001: Race, 2013-2017 5-Year Estimates.

[14] FactFinder, American Community Survey, Table B03002, Hispanic or Latino Origina by Race, 2013-2017 5-Year Estimates.

[15] FactFinder, American Community Survey, Table S1701: Poverty Status in the Past 12 Months, 2013-2017 5-Year Estimates.

Vehicle Availability and Commuting

In New Hampshire, 98.1% of workers have access to at least one motor vehicle, with 81.9% having access to two or more, and 36.5% having access to three or more vehicles. Approximately 80.9% of New Hampshire residents commute to work by driving alone with 8.0% carpooling, 0.9% using public transportation and 6.1% working from home. According to the ACS, approximately 3.0% of people commuted to work by walking or biking[16]. However, it is important to note that a higher percentage of non-commute trips are typically taken by walking and bicycling. Therefore, the 3.0% figure does not paint a complete picture related to the amount of walking and bicycling that occurs on a daily basis throughout the state. Finally, the estimated mean, one-way travel time to work in New Hampshire, taking all modes into account, is roughly 29.4 minutes[17].



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

1.3.2 Population and Growth

New Hampshire's population has generally increased over the past quarter century, resulting in large changes to many of its communities. This is especially the case in Southern New Hampshire, as cities and towns experienced growth due to relatively convenient access to jobs in Greater Boston, the Route 128 Technology Corridor, and cities along I-495 in Massachusetts. Over the next few decades, some historic towns and cities throughout New Hampshire will experience both opportunities and challenges as many Baby Boomers retire and downsize and many Millennials seek urban and walkable places with a variety of amenities in which to live. Many of the state's most populous municipalities—e.g. Manchester, Nashua, Concord, Dover, Rochester, Keene, Portsmouth, etc.—have compact downtowns and historic neighborhoods that are conducive to walking. With appropriate planning strategies and infrastructure funding policies at the state and local levels, opportunities exist to replace automobile trips with walking and bicycling trips. According to University of New Hampshire demographers, the state experienced a population increase between 2010 and 2017 up to 1.3 million, and is expected to see approximately 162,000 new residents through net migration by 2040.[18] **The mobility, health, transportation preferences, and economic impact of this population shift supports the need for better places for New Hampshire residents to walk and bicycle more safely.**

[16] FactFinder, American Community Survey, Table B08006: Sex of Workers by Means of Transportation to Work, 2013-2017 5-Year Estimates.

[17] FactFinder, American Community Survey, Table B08303: Travel Time to Work, 2013-2017 5-Year Estimates (weighted average assuming mid-value of each bin)

[18] New Hampshire Business Review, "State's population growth all depends on migration", by Michael Kitch, September 13, 2018,

1.3.3 Public Health and Active Transportation

Developed strategically, sidewalks improve the walkability of the state's highways (Berlin image: Rebecca Harris)

Besides improved mobility options, both walking and bicycling have the added benefit of providing direct health benefits, including reduced obesity. New Hampshire's current adult obesity rate is 28.1%.[19] Although this is the 13th lowest in the U.S., the rate dramatically increased from 9.9% in 1990 to 16.1% in 2000.[20] The obesity epidemic is not confined to the adult population, as 12.8% of high school students are obese.[21] Creating enhanced walking and bicycling environments in towns and cities throughout the state can provide an opportunity for state residents to meet recommended levels of physical activity and combat the problems associated with obesity such as chronic diseases. The U.S. Department of Health and Human Services recommends the following levels of activities by age group:[22]

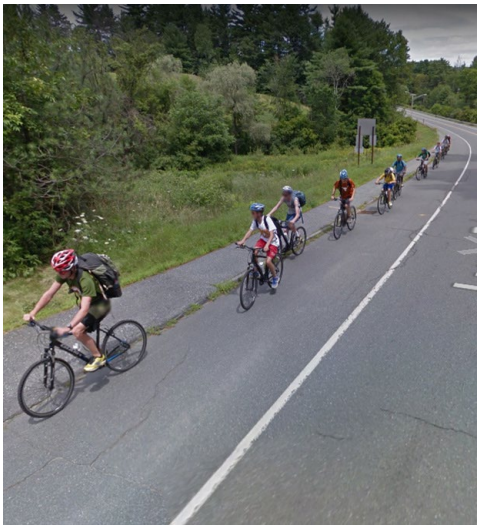
- Children and adolescents (ages 6 through 17 years) should engage in 60 minutes or more of moderate-to-vigorous daily physical activity.
- Adults should engage in 150 minutes to 300 minutes of weekly moderate-intensity aerobic physical activity or 75 minutes to 150 minutes of weekly vigorous-intensity aerobic physical activity.

[19] The State of Obesity, New Hampshire, 2017, https://stateofobesity.org/states/nh/
[20] The State of Obesity, New Hampshire, 2017, https://stateofobesity.org/states/nh/
[21] The State of Obesity, New Hampshire, 2017, https://stateofobesity.org/states/nh/
[22] Physical Activity Guidelines for Americans, 2nd Edition, 2018, U.S. Department of Health and Human Services, https://health.gov/paguidelines/second-edition/pdf/Physical_Activity_Guidelines_2nd_edition.pdf

- When older adults cannot do 150 minutes of moderate-intensity aerobic physical activity per week because of chronic conditions, they should be as physically active as their abilities and conditions allow.

Despite these recommendations, state-level results from the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System showed that 20.6% of New Hampshire adults over 20 years old reported that they had not participated in any leisure-time physical activity in the last week.[23]

Better pedestrian and bicycle facilities can encourage and promote active transportation, enabling both adults and adolescents to reach the recommended activity levels as part of their daily routines. New trails, sidewalks, pedestrian-friendly intersections, and on-street bicycle facilities will likely promote walking and bicycling for both utility and recreational trips and promote a more active lifestyle that can improve public health outcomes statewide.



Wide shoulders and trails can promote active transportation for many age groups (Hanover image: Google)

1.3.4 Active Transportation Policy and Mobility

Walking and bicycling are efficient types of transportation that make a small footprint compared with automobile travel. Pedestrians and bicyclists require far less infrastructure than motorists, help to reduce congestion, and improve personal health. However, too often walking and bicycling are viewed as recreational and not considered serious forms of transportation. Despite the rate of pedestrian and bicycle injuries increasing between 2009 and 2013 (after steadily dropping between 1994 and 2008), federal funding for pedestrian and bicycle transportation has decreased from a peak level of $1.2 billion in 2009 to roughly $1.0 billion per year between 2012 and 2016.[24] This change places more pressure on local and state governments to fill the gap.

Improving mobility strategically with targeted investment in pedestrian and bicycling facilities will improve transportation choice, safety, and connectivity throughout New Hampshire. Additional benefits include healthier air and more exercise time by reducing time idling in traffic congestion. Better coordination between land use and transportation planning will have a major impact on mobility in the future and will be important to the success of this plan.

[23] New Hampshire, 2018 County Health Rankings Report, Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, http://www.countyhealthrankings.org/sites/default/files/state/downloads/CHR2018_NH_v2.pdf

[24] League of American Bicyclists, 2018 Benchmarking Report: $3.797 billion in federal transportation funding obligated for bicycling and walking coded projects between FY2002 and FY2016, p. 138

1.4 Existing Pedestrian and Bicycle Facilities

New Hampshire's highway transportation infrastructure currently provides opportunities for walking, bicycling and accessibility for those with disabilities in many cities, towns and villages throughout New Hampshire. This includes a range of highway, pedestrian and bicycle facilities as described below.

1.4.1 Pedestrian Facility Types

Except for where specifically prohibited by regulation, pedestrians may travel along all public roads and highways, and sidewalks can be found along some of New Hampshire's state highways. Supplementing sidewalks in discrete locations are curb ramps, crosswalks, median refuge islands, traffic signals and traffic-calming measures such as bump outs (i.e. curb extensions). Combined, these facilities form a 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. (Although New Hampshire has many miles of trails for hiking, they are not included within the scope of this study.)

A crosswalk and median refuge island in Windham (photo: Rebecca Harris)

State highway shoulders can serve both pedestrians and bicyclists (Route 1A in Hampton)

Ideally, the local pedestrian network provides connectivity to various destinations while also providing a safer means to negotiate barriers such as busy intersections. On state roadways outside of Urban Compact Areas, sidewalks typically exist only where local municipalities have agreed to maintain them. Where sidewalks don't exist, pedestrians may travel along roadway shoulders. Where shoulders don't exist, pedestrians may travel close to the edge of the roadway, and on two-way roads, legally must travel facing traffic. A few highways in the state feature a shared use path within the ROW, also called a "sidepath".

1.4.2 Bicycle Facility Types

The state's bicycle network includes all public highways except where bicycles are specifically prohibited by regulation. While there are no marked bicycle lanes maintained by NHDOT, some communities have marked a limited number of local streets and highways within their jurisdictions with shared lane markings—also known as "sharrows"—and designated bicycle lanes. Many of the state's rail trails and greenways offer a comfortable bicycling environment

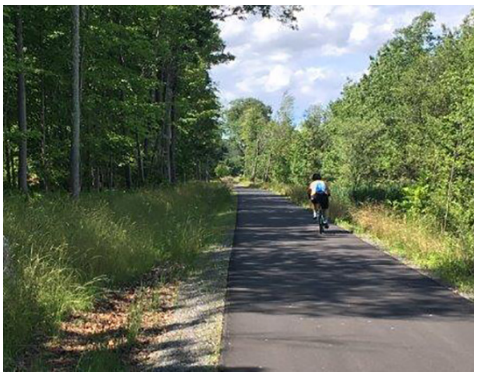
for nearly all ages and abilities, but shared use paths and bicycle-specific facilities are discontinuous.

Table 1 – Statewide Facilities

Type	Approximate Centerline Miles
Shared Use Paths (e.g. rail trails, side paths)	415
Striped Bicycle Lanes	50
Local and State Roads (*excludes interstates*)	21,400

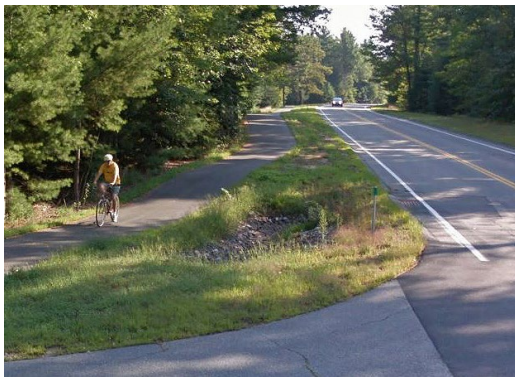
An inventory of current multi-use and bicycle facilities in New Hampshire is shown below and on the maps in sections 1.6 and 1.7 of this technical memorandum. These form the bulk of the bicycle-facility design options that will be part of the recommended statewide bicycle network to be developed later in the planning process.

- **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. It is used by pedestrians, runners, skaters and bicyclists. In winter, many are used by Nordic skiers and snowmobiles. There are approximately 415 miles of shared-use paths—both paved and unpaved—in New Hampshire, primarily built on abandoned rail corridors, with a number of paths built within or adjacent to road rights of way (see below).



Salem Bike-Pedestrian Corridor (photo: Dave Topham)

- **Sidepath** - Sidepaths are SUP's that run 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 by a landscaped buffer, solid barrier, split rail fence or some combination. Similar to sidewalks (as discussed above), NHDOT does not provide sidepaths unless a local municipality or NH Department of Natural and Cultural Resources has agreed to maintain them.



Albuquerque Avenue sidepath in Litchfield (Google image)

- **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. Bicycle lanes have been striped in a number of municipalities including Conway, Hanover, Lebanon, Keene, Concord, Manchester, Dover, Durham and Portsmouth. Sub-categories of bike lanes include:
    - **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.
    - **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 and use a variety of methods for separation from motor vehicles and pedestrians. A parking lane, roadway striping with flexible delineator posts, or other barrier types may provide the vertical separation from motor vehicle traffic. Separated bicycle lanes can be one-way or two-way facilities.

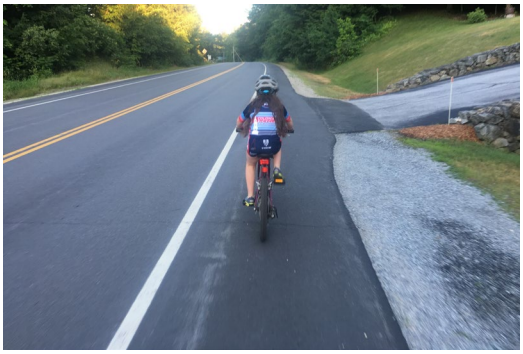
Chestnut Street bike lane (photo: Bike Manchester web site)


Middle Street in Portsmouth contains the only Separated Bicycle Lane in the state as of 2019

- **Marked Shared Lane** – Marked shared-lane highways are designated with shared-lane markings in the roadway. Share lane markings reinforce the legitimacy of bicycle traffic on the street, recommend proper bicyclist positioning and may be configured to offer directional and wayfinding guideance. Shared lane markings are placed on highways with variable traffic volumes. The MUTCD notes that 'shared lane marking should not be placed on roadways that have a speed limit above 35 mph. Flanking dashed lines and/or a green color backing can be used to increase visibility and awareness of the marking.


Installation of shared lane marking along West Shore Road in Bristol

- **Bikeable Shoulders** - Bikeable shoulders are paved areas adjacent to the highway travel lanes, delineated by a white edge line. In New Hampshire, some shoulder bikeways were made possible by reallocation of roadway space and narrowing the travel lanes in coordination with local municipalities. The narrower lanes provide additional shoulder width that benefits both bicyclists and pedestrians.



Bikeable shoulder along Rt. 103 in Claremont (photo: Tim Blagden)

- **Signed bike route** – Signed bike routes include a series of signs that identify the particular highway as a route for bicycle travel. The signage helps to warn motorists of the presence of bicycles along the highway and can be an important wayfinding tool for bicyclists, especially in highly scenic parts of the state.

Signed bike route, NH 1A in North Hampton

- **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. Bike boxes—frequently rendered with green pavement markings—also alert motorists to the potential presence of bicyclists along the roadway and promote higher levels of caution for motorists making a right turn.

Green bike box at the head of Main Street in Downtown Keene (photo: City of Keene)

1.5 Statewide Inventory of Sidewalks

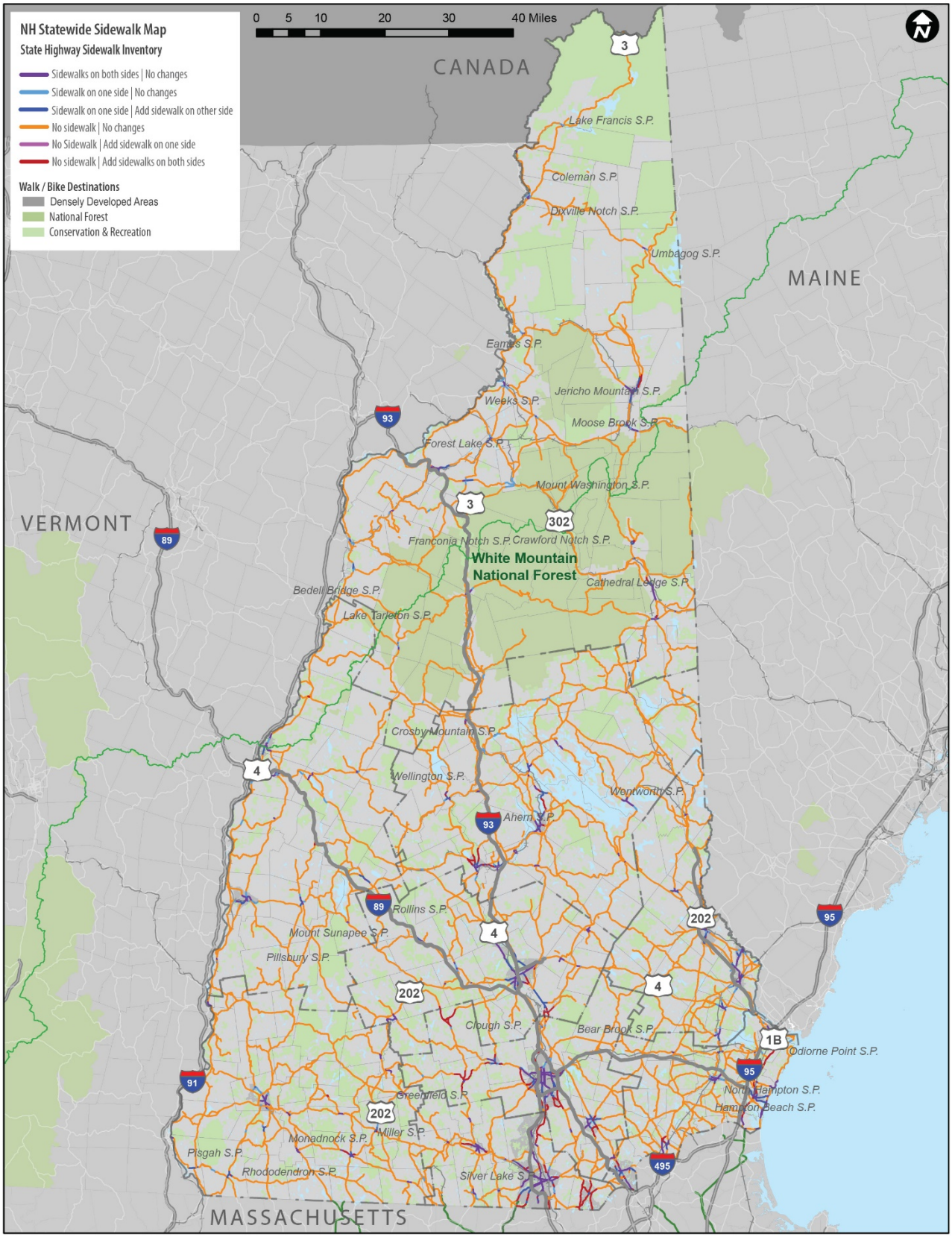
The New Hampshire Pedestrian and Bicycle Transportation Plan includes an inventory of existing sidewalks along 1) highways owned and maintained by NHDOT, and 2) numbered highways within Urban Compact Areas owned and maintained by local municipalities. These sidewalks vary in width, condition, and material (concrete or asphalt). Some are adjacent to curbs, others are separated from the adjacent roadway with a grassy offset or landscaped buffer.

The maps on the following pages illustrate both the presence of existing sidewalks in New Hampshire, along with locations where sidewalks should be considered in the future. The latter includes potential new sidewalks on:

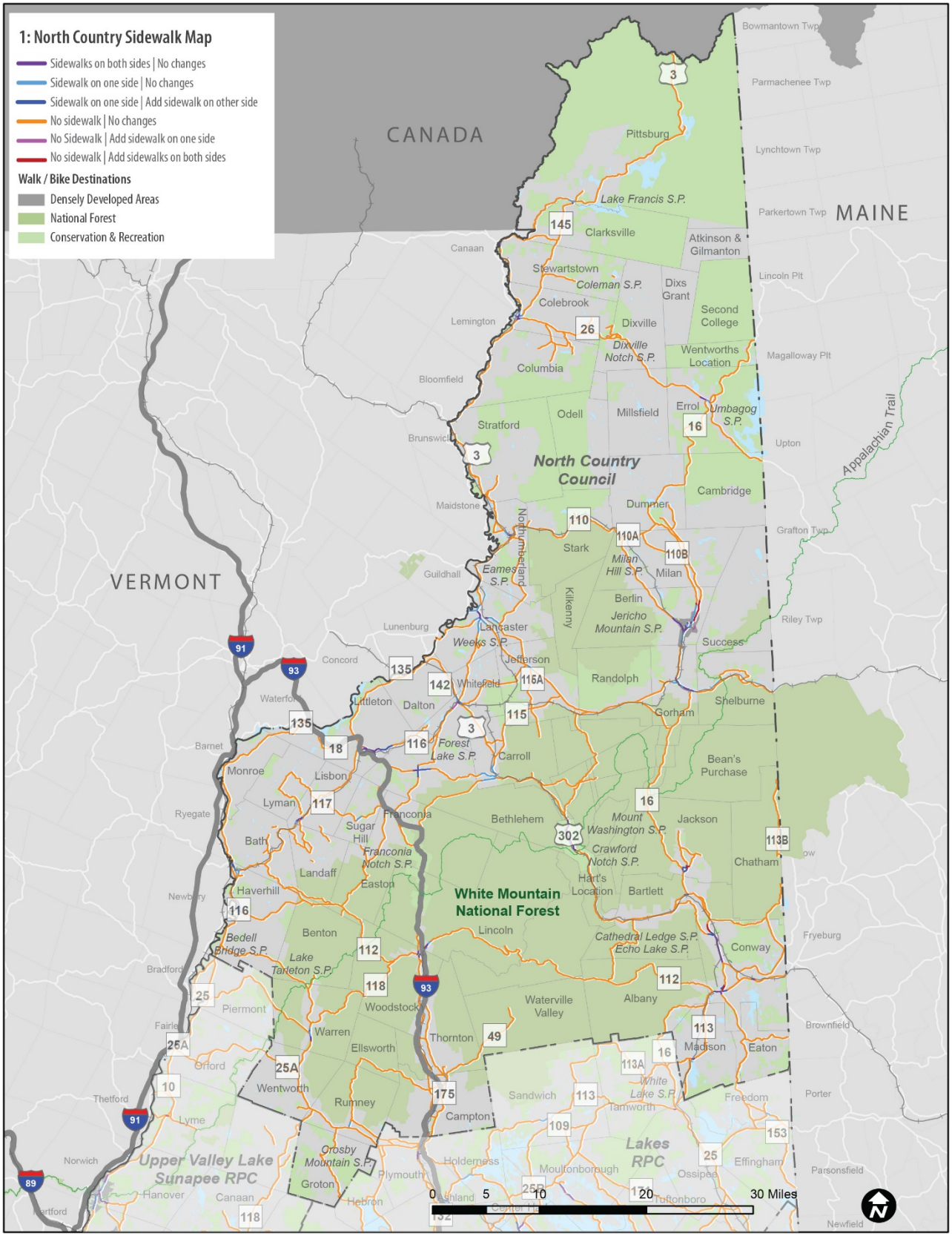
In Harrisville, a sidewalk on one or both sides of Main Street could improve pedestrian accessibility

- state-owned highway and locally-owned numbered highways through town and village centers that lack a sidewalk on one or both sides;
- locally-owned numbered highways 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 side of the highway are preferred except in cases where land development has yet to occur or where there are physical constraints on one side of the roadway.

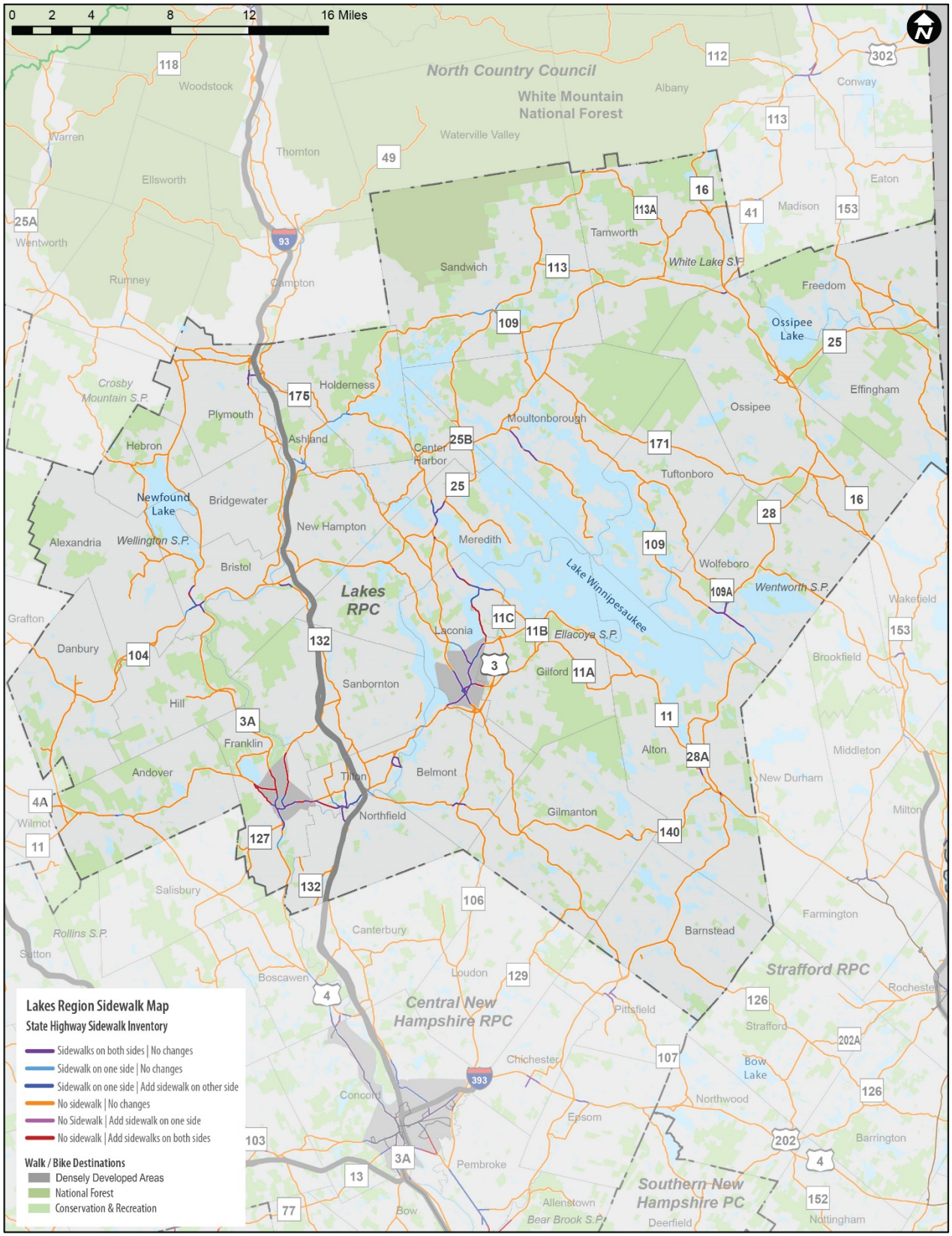
Map 1 – Sidewalk Inventory Map – Statewide



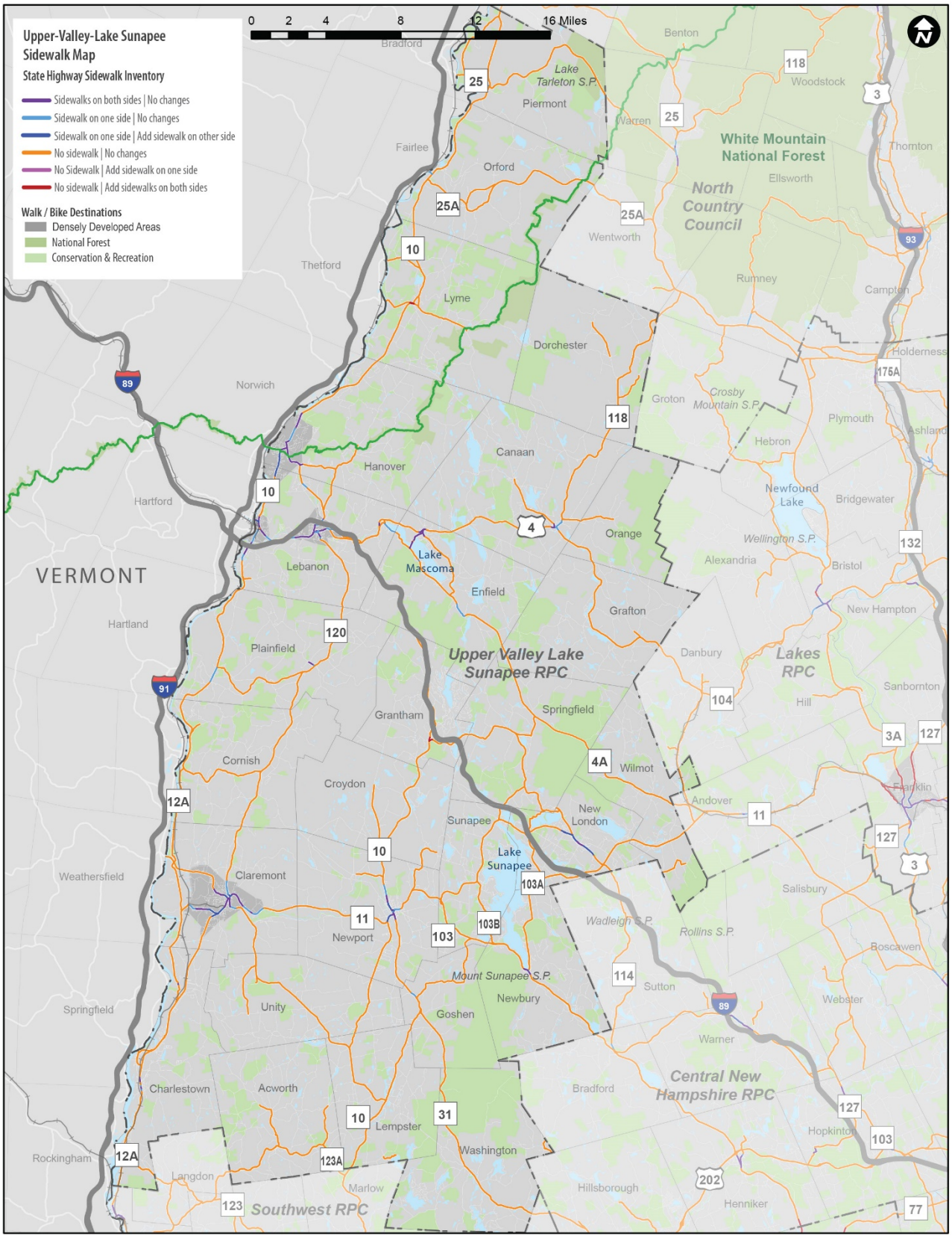
Map 2 - Sidewalk Inventory Inset Map 1 – North Country



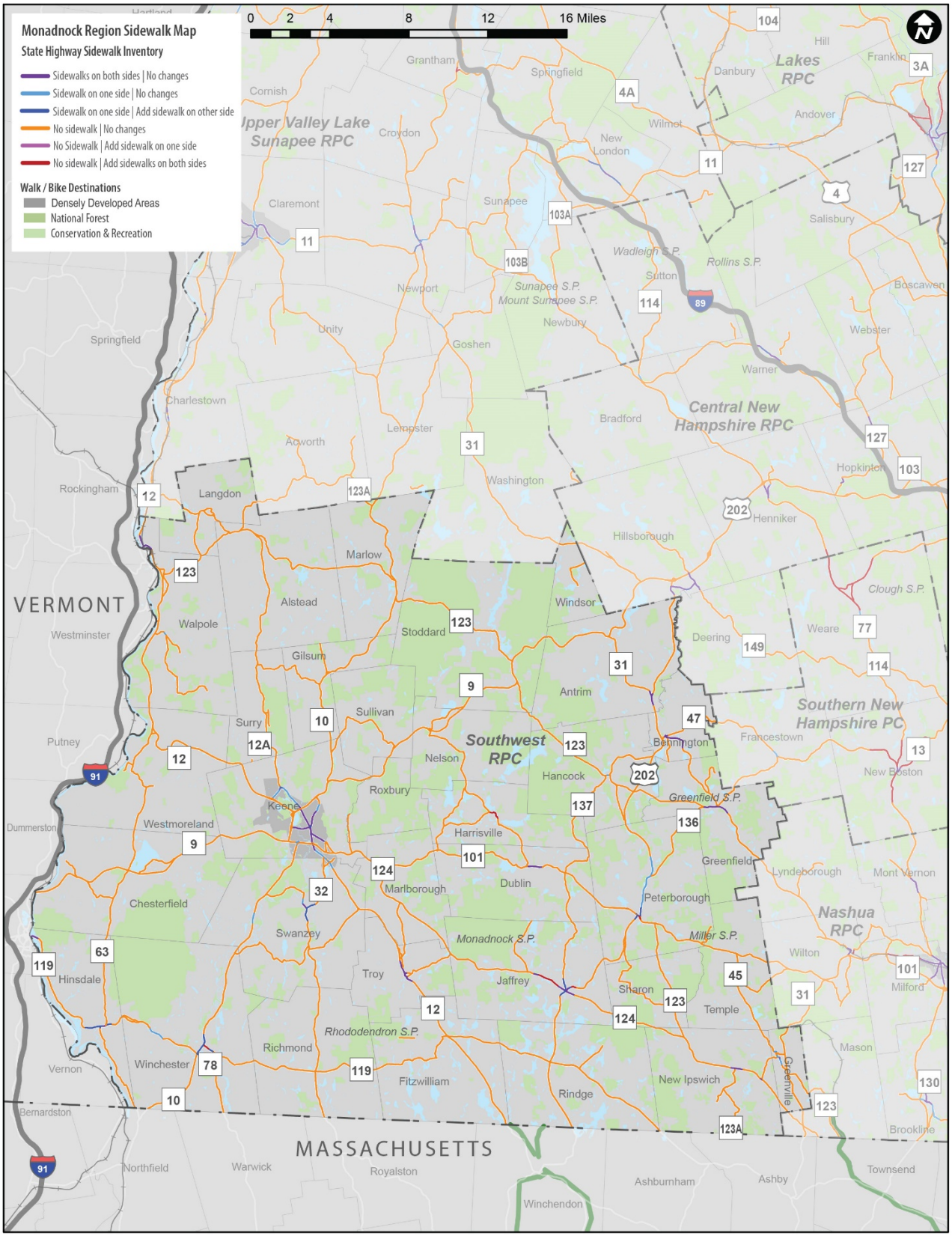
Map 3 - Sidewalk Inventory Inset Map 2 – Lakes Region



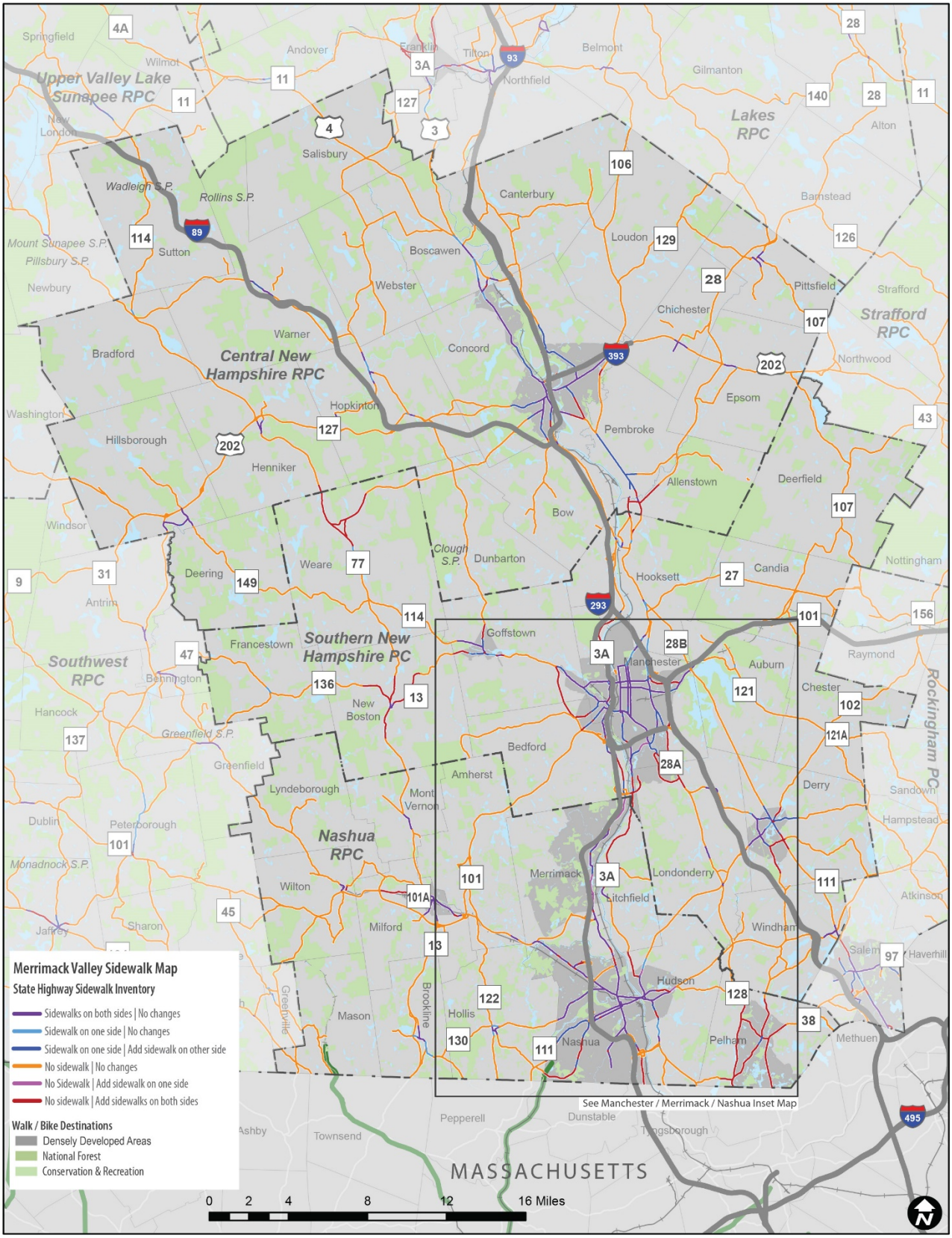
Map 4 - Sidewalk Inventory Inset Map 3 – Hanover-Sunapee Region



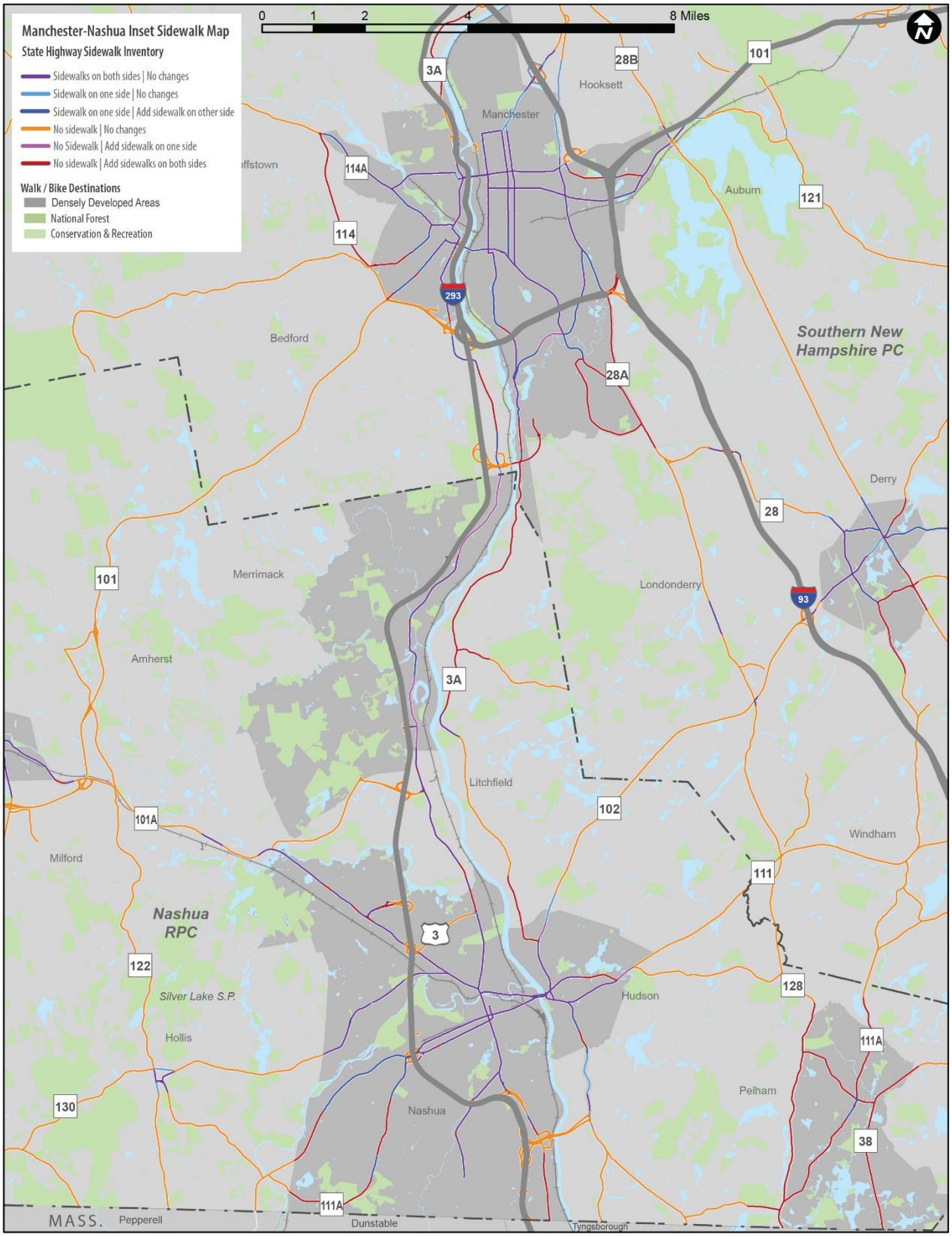
Map 5 - Sidewalk Inventory Inset Map 4 – Monadnock Region



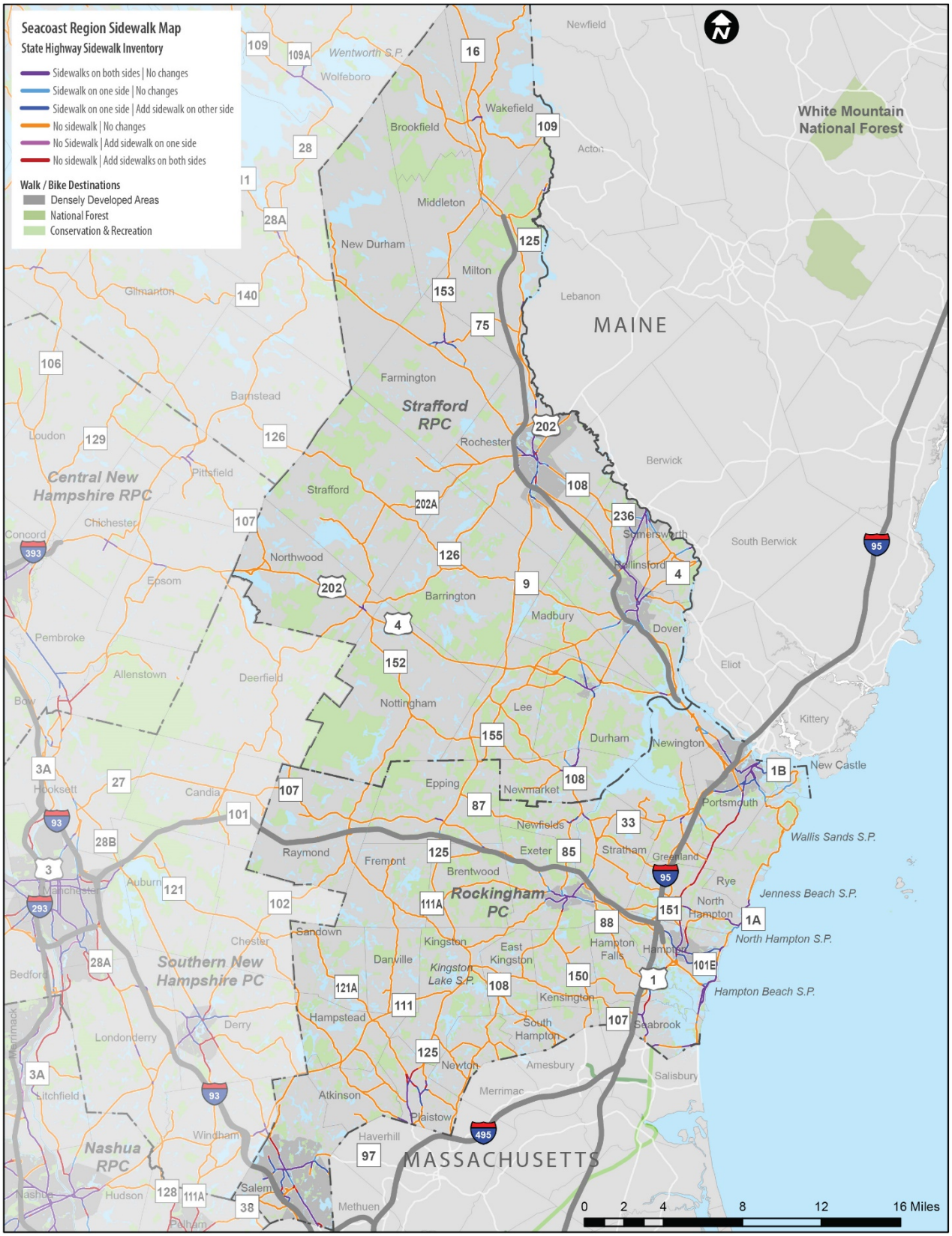
Map 6 – Sidewalk Inventory Inset Map 5 – Merrimack Valley



Map 7 – Sidewalk Inventory Inset Map 5A – Manchester-Nashua Inset



Map 8 – Sidewalk Inventory Inset Map 6 – Seacoast Region

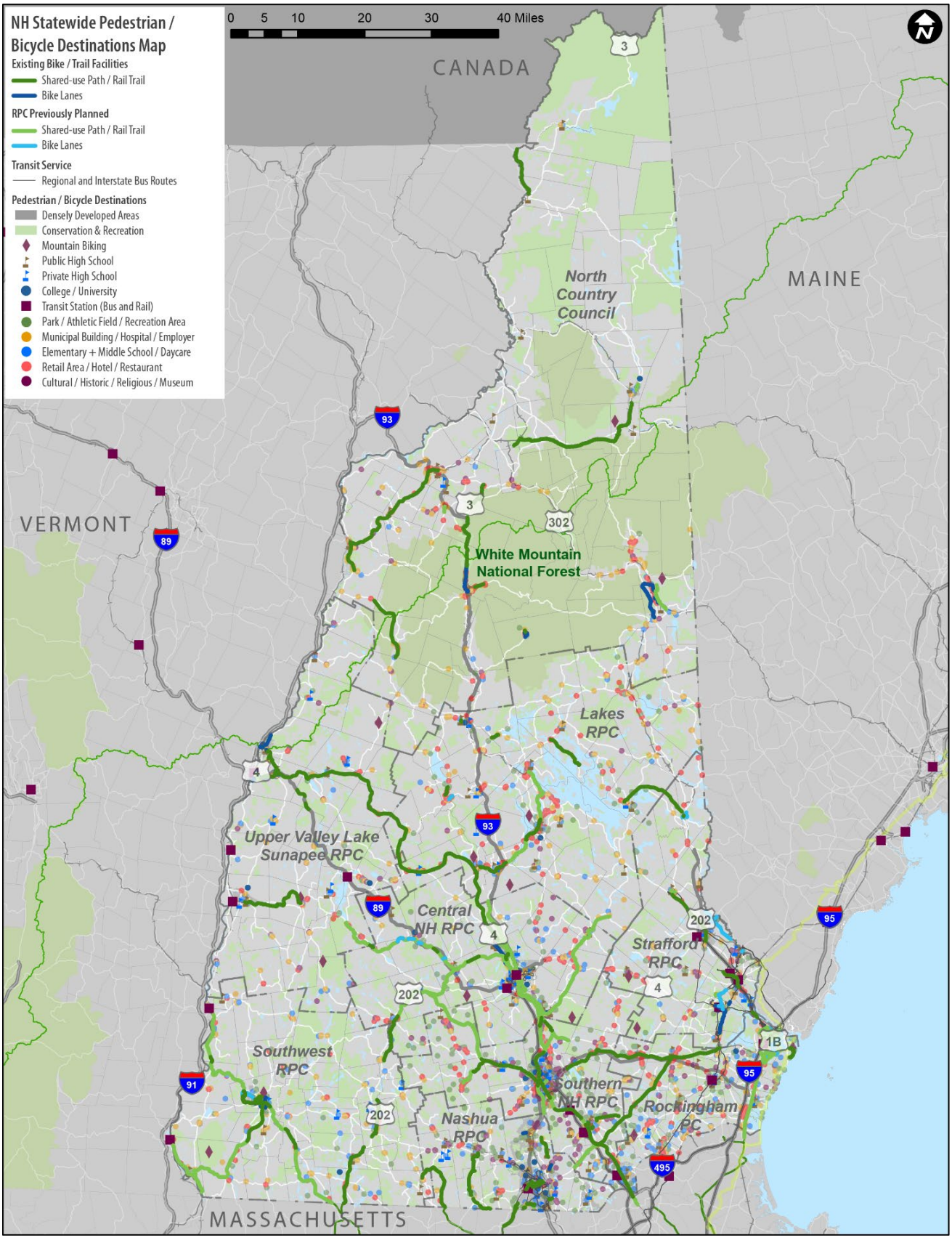


1.6 Pedestrian and Bicycle Destinations

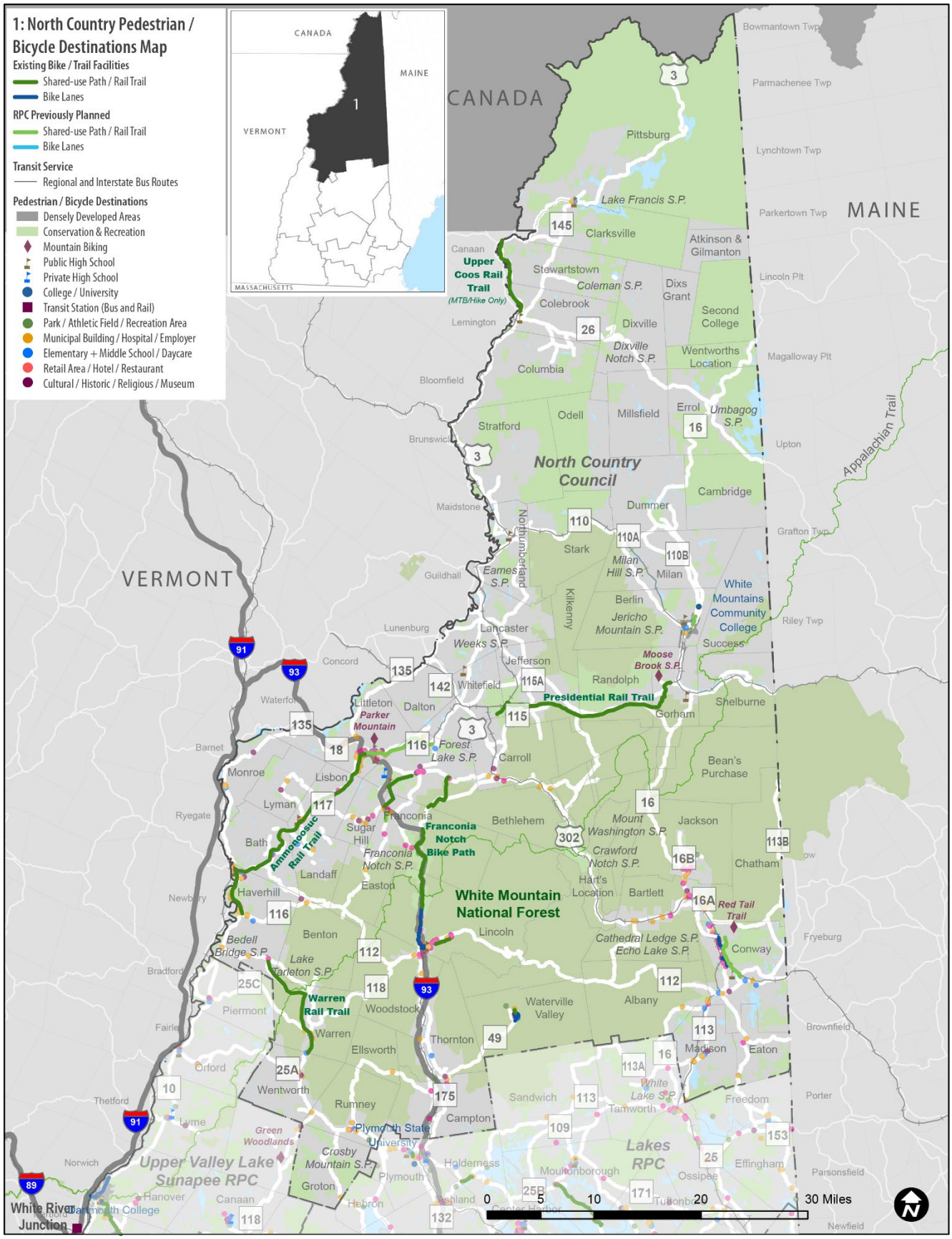
Pedestrian and bicycle-related destinations are places where people walking, using a wheelchair or riding bicycles (for either transportation or recreation) have a particular need or desire to access. While pedestrians and bicyclists legally have the right to travel to any particular location in the state (except where restricted by regulation, such as interstate highways), there are specifically-defined places that are a significant draw for pedestrians and bicyclists. Defined here as "destinations," these include municipal facilities, colleges and universities, compact retail/commercial districts, public and private schools, municipal buildings, hospitals, and transit facilities (including park-and-rides that connect to express buses). Destinations can also include areas more typically associated with pedestrian and bicycle recreational use, including state and local parks, athletic fields, historic/cultural sites, shared use paths, beaches, and mountain biking areas. The Pedestrian and Bicycle Destinations maps shown on the following pages include data gathered from Regional Planning Commission GIS files, along with feedback the Project Advisory Committee and the online input map. An understanding of these destinations, along with mapping the potential connectivity between destinations (in the following section), will help to inform recommendations for eliminating these gaps and improving pedestrian and bicycle conditions throughout New Hampshire.

The commercial district of Hampton Beach, along with those in other cities and towns with shops and restaurants are significant destinations for pedestrians and bicyclists

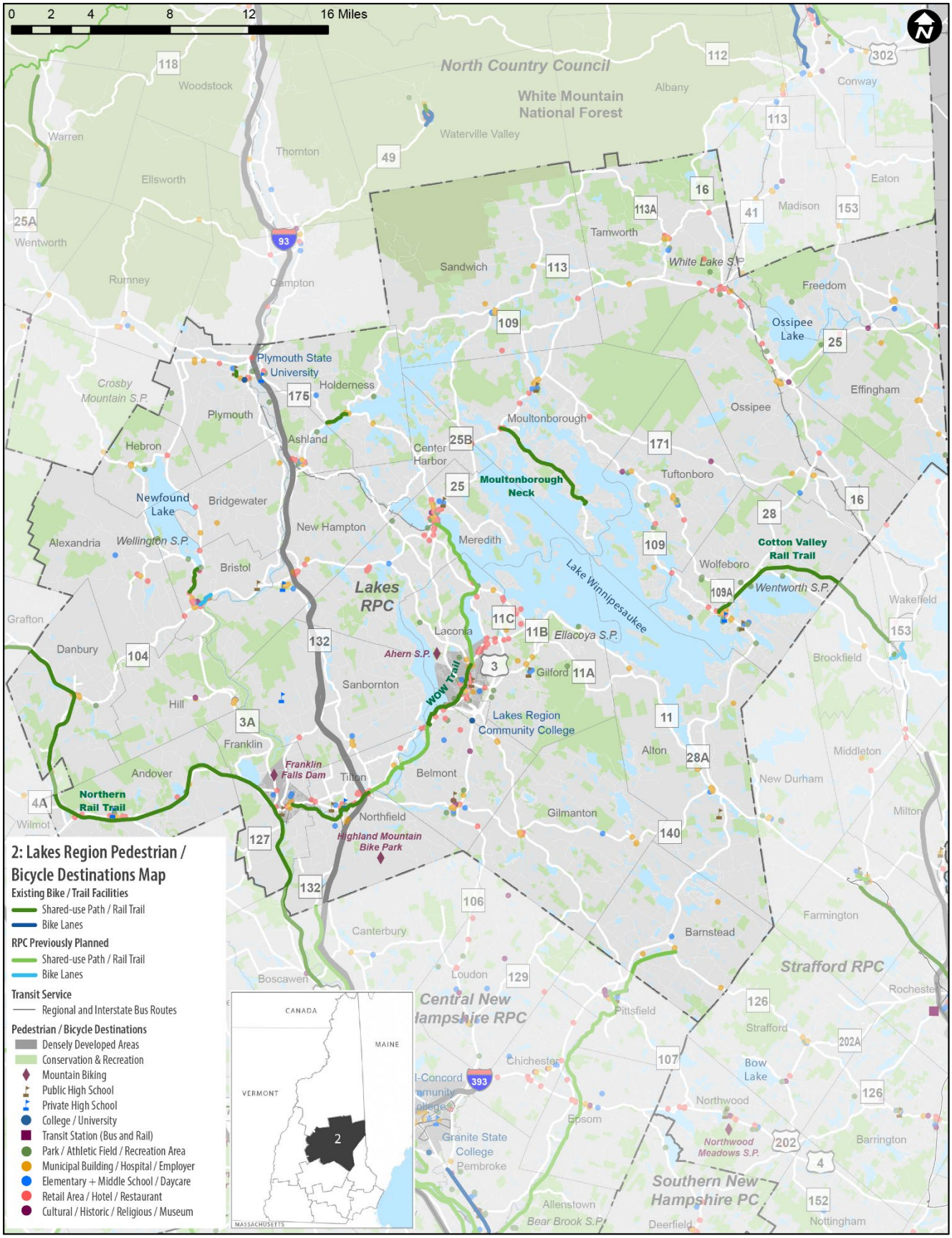
Map 9 – Pedestrian and Bicycle Destinations Map – Statewide



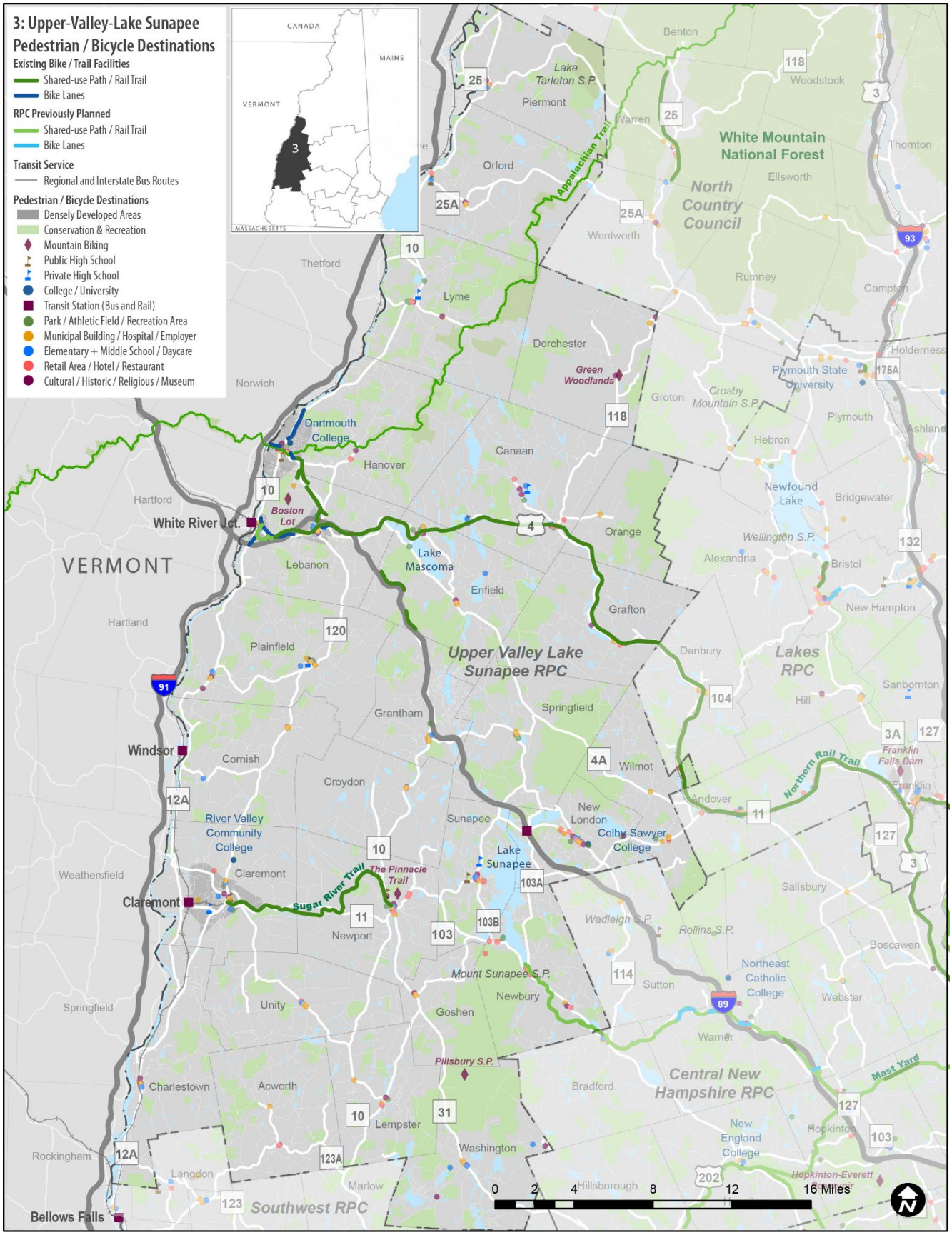
Map 10 – Pedestrian and Bicycle Destinations Inset Map 1 – North Country



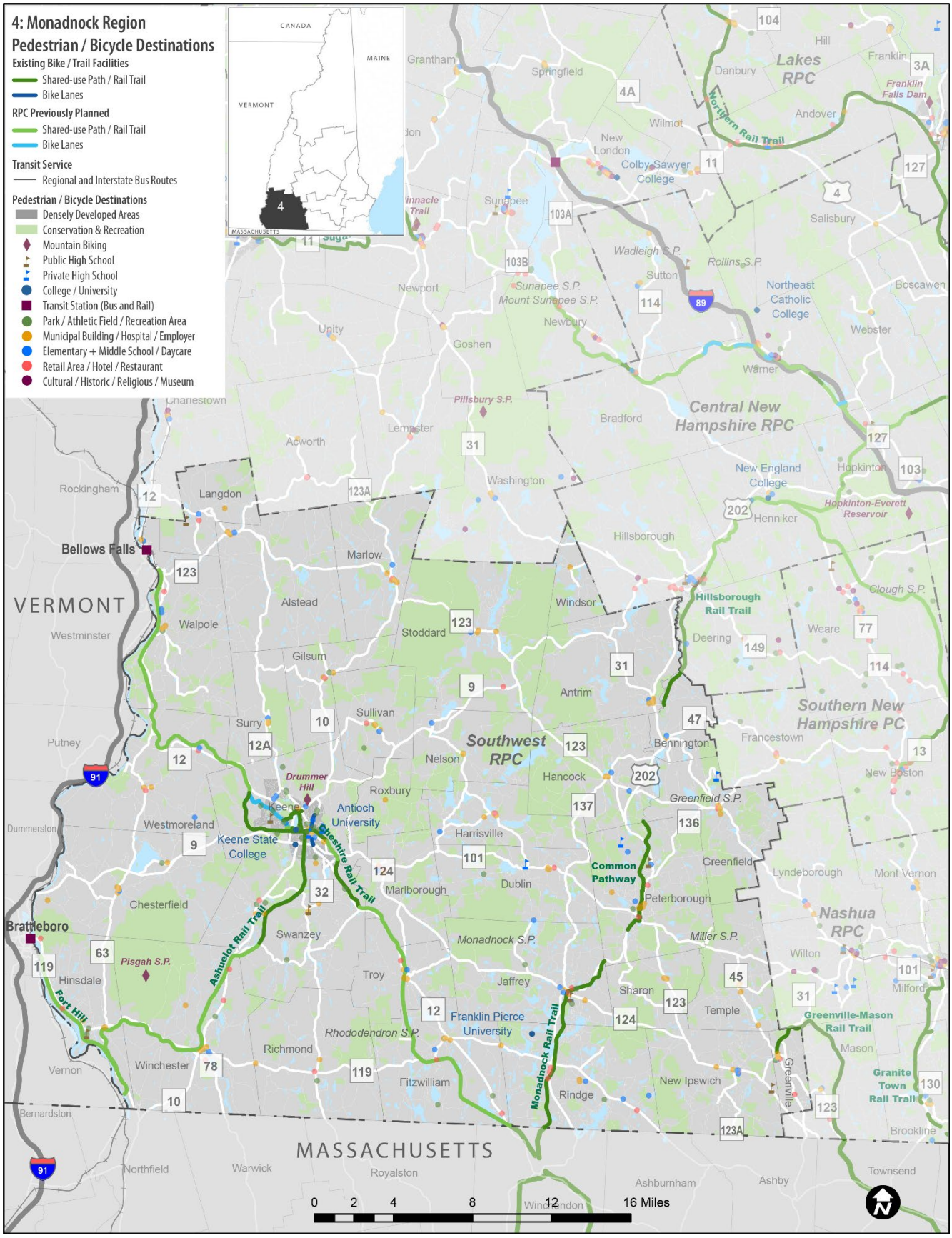
Map 11 – Pedestrian and Bicycle Destinations Inset Map 2 – Lakes Region



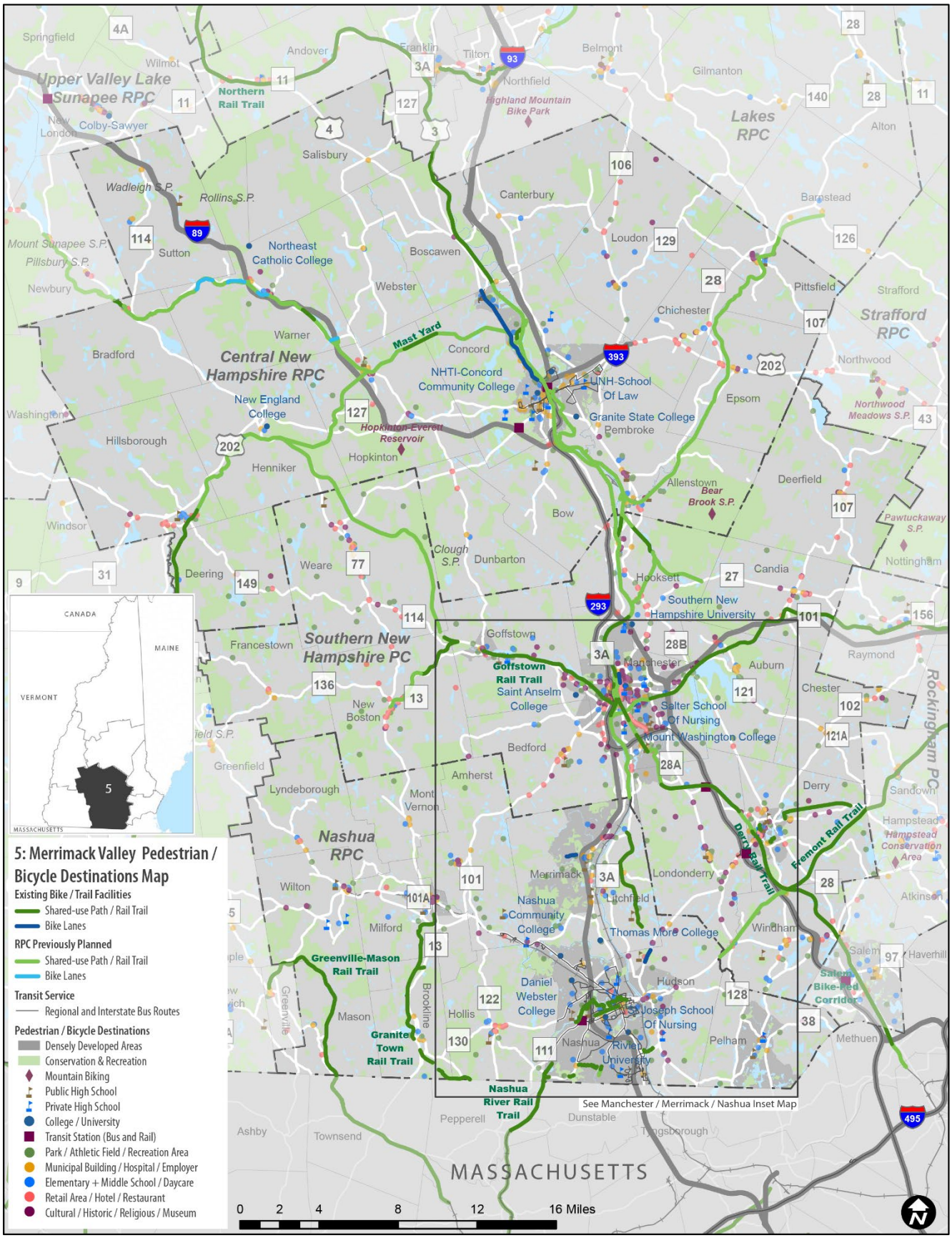
Map 12 – Pedestrian and Bicycle Destinations Inset Map 3 – Hanover-Sunapee Region



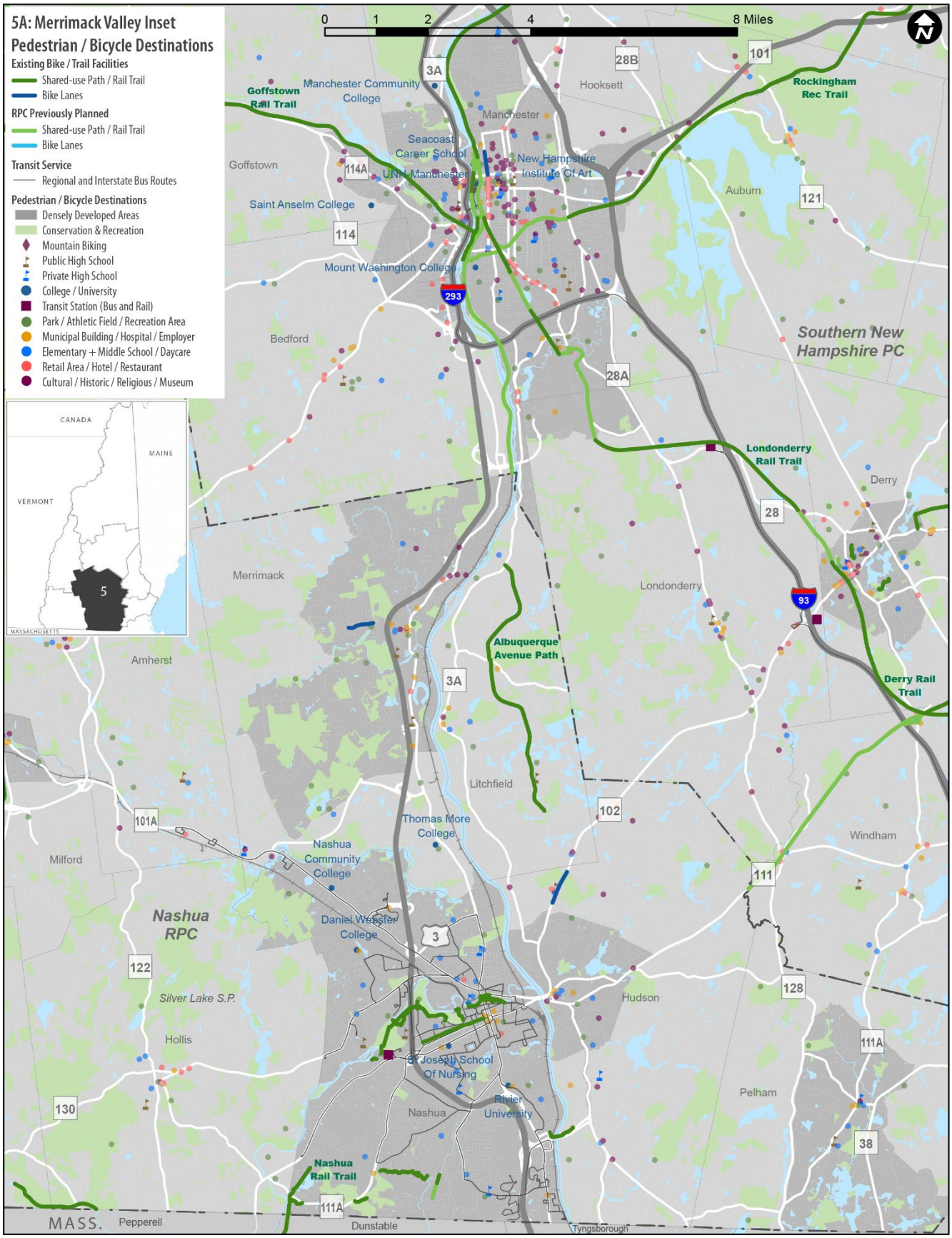
Map 13 – Pedestrian and Bicycle Destinations Inset Map 4 – Monadnock Region



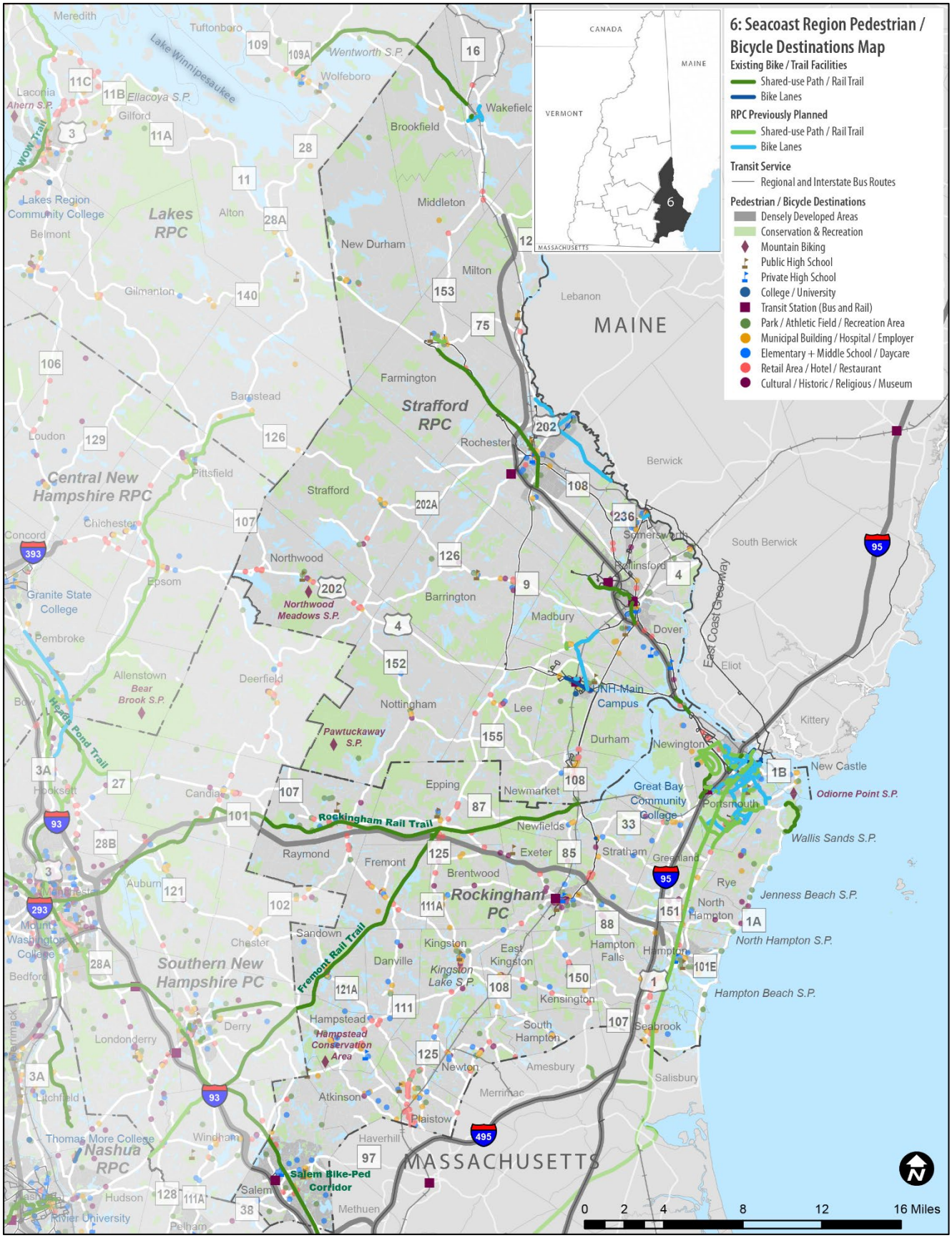
Map 14 – Pedestrian and Bicycle Destinations Inset Map 5 – Marrimack Valley



Map 15 – Pedestrian and Bicycle Destinations Inset Map 5A – Manchester-Nashua Inset



Map 16 – Pedestrian and Bicycle Destinations Inset Map 6 – Seacoast Region



1.7 Bicycle Facility Connectivity Analysis

The Connectivity Analysis task focuses on the identification of missing links in the on-road bicycling network, focusing primarily on state-owned highways and locally-owned numbered highway corridors through Urban Compact Areas. In some cases, locally-owned roads are included to provide a potential route that bypasses a state highway with high traffic volumes and posted speeds over 50 mph.

The consultant team's analysis included the establishment of Connectivity Corridors, the primary network of highways that could provide bicycling (and pedestrian) connections between communities and destinations throughout the state. Informing the establishment of the corridors were comments from the Project Advisory Committee, input from the Technical Advisory Committees of the state's nine Regional Planning Commissions, and comments from the online input map available on the project web site, http://nhpedbikeplan.org/. Connectivity Corridors were sub-divided into:

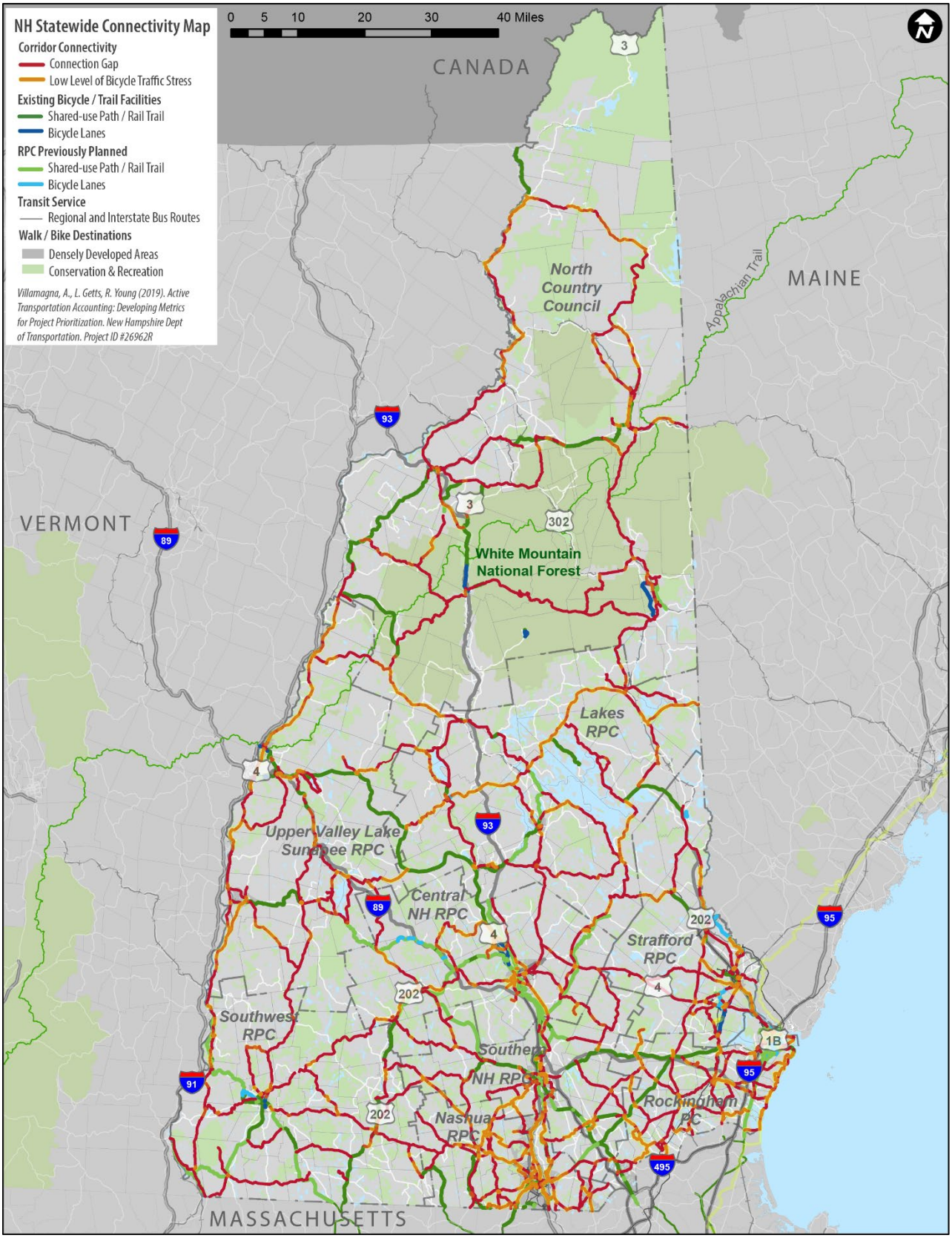
- **Low Level of Traffic Stress**: using the methodology established by a combination of the Statewide Pedestrian and Bicycle Transportation Plan team, Plymouth State University and members of a work group formed by the Rockingham Planning Commission, Connectivity Corridors with bicycle Level of Traffic Stress[25] (LTS) scores of "1" or "2" were mapped. These stand as proxies for state- and locally-owned highways that offer a reasonably comfortable environment for bicyclists of a variety of ages and abilities.
- **Connection Gaps**: highways through rural, suburban or urban areas which did not receive a low bicycle LTS score are considered Connection Gaps. These include gaps along lengthy highway corridors and/or more-targeted locations lacking facilities to accommodate safer and more comfortable travel for bicyclists. In either case, the missing links where bicycle (and pedestrian) facilities may be desired but do not exist, will feature improvement recommendations in subsequent phases of the planning effort.

Due to the presence of a 5'-wide shoulder and other factors, NH 3 in Merrimack is an example of a numbered highway with a low LTS score

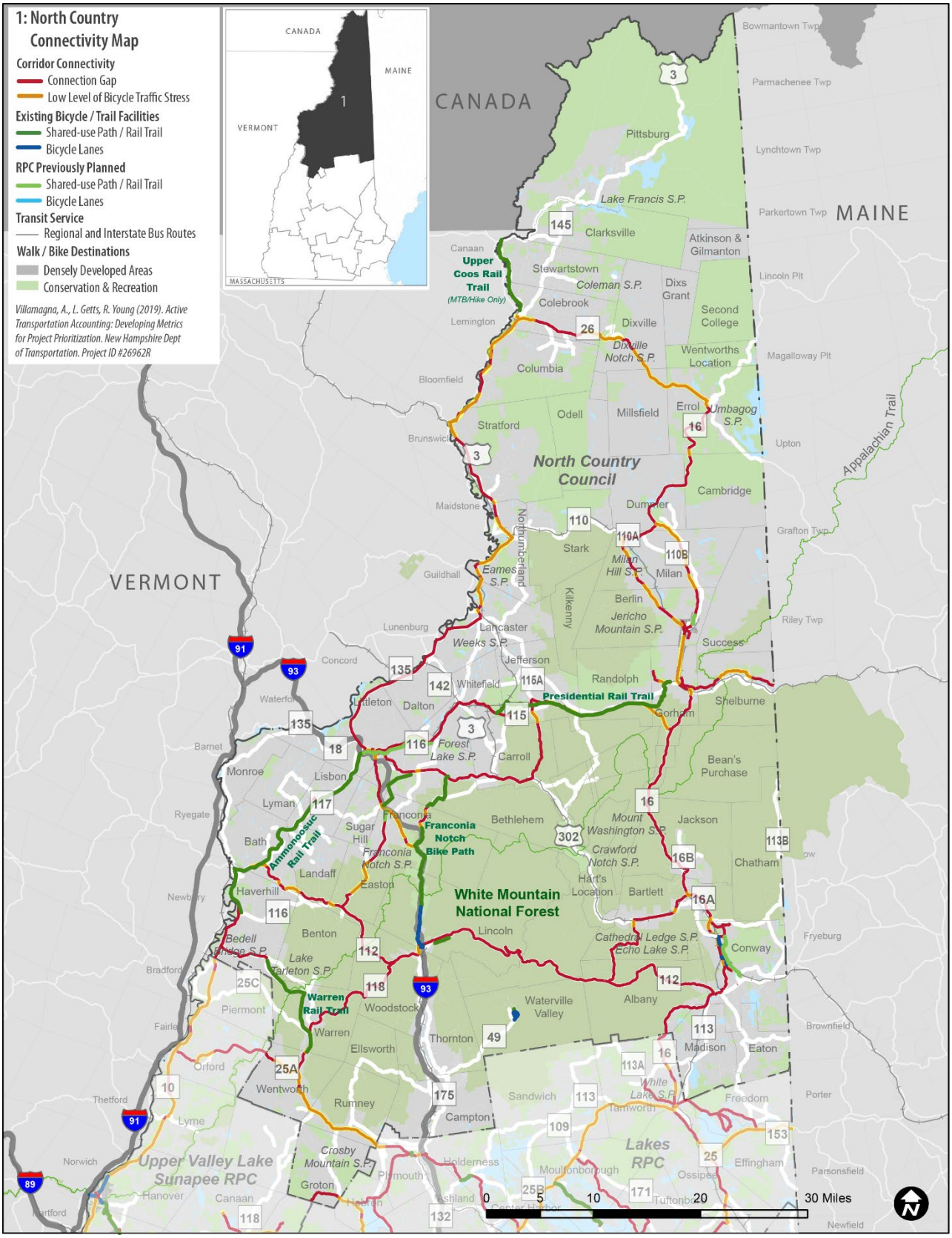
NH 140 is a Connectivity Gap between the Towns of Belmont and Tilton (image: Google)

[25] Level of Traffic Stress scores are determined based on a roadway segment's posted speed limit, traffic volume, number of lanes, presence/width of a shoulder or bicycle facility, and whether on-street parking is permitted. Modeling these inputs provides a composite score of 1 through 4, with "1" indicating the lowest level of stress (i.e. a low volume, low-speed roadway or one with wide shoulder or adjacent shared use path), and "4" indicating a high-stress roadway segment with a combination of higher traffic volume, higher posted speed limit, more travel lanes and narrow shoulders.

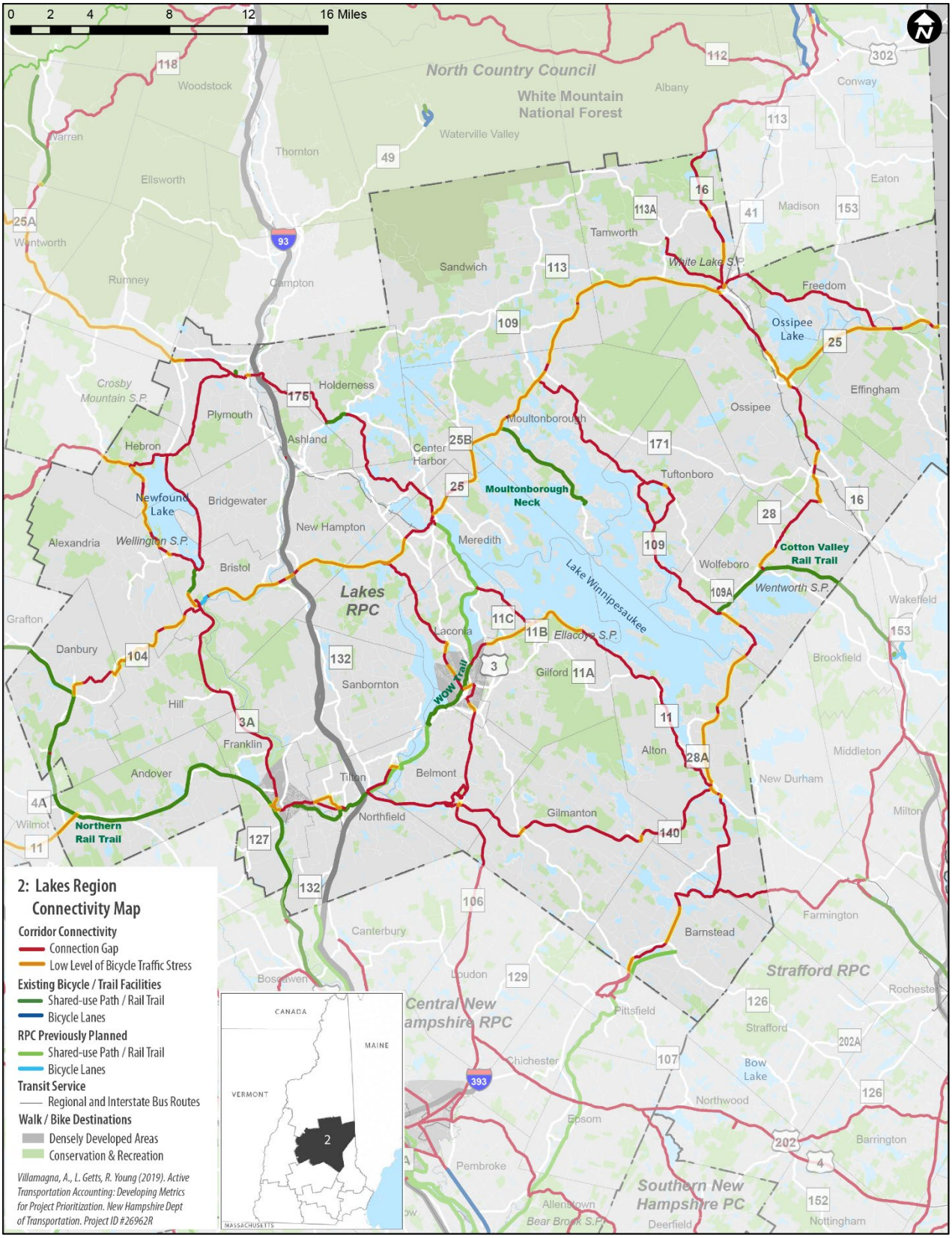
Map 17 – Bicycle Facility Connectivity Analysis Map – Statewide



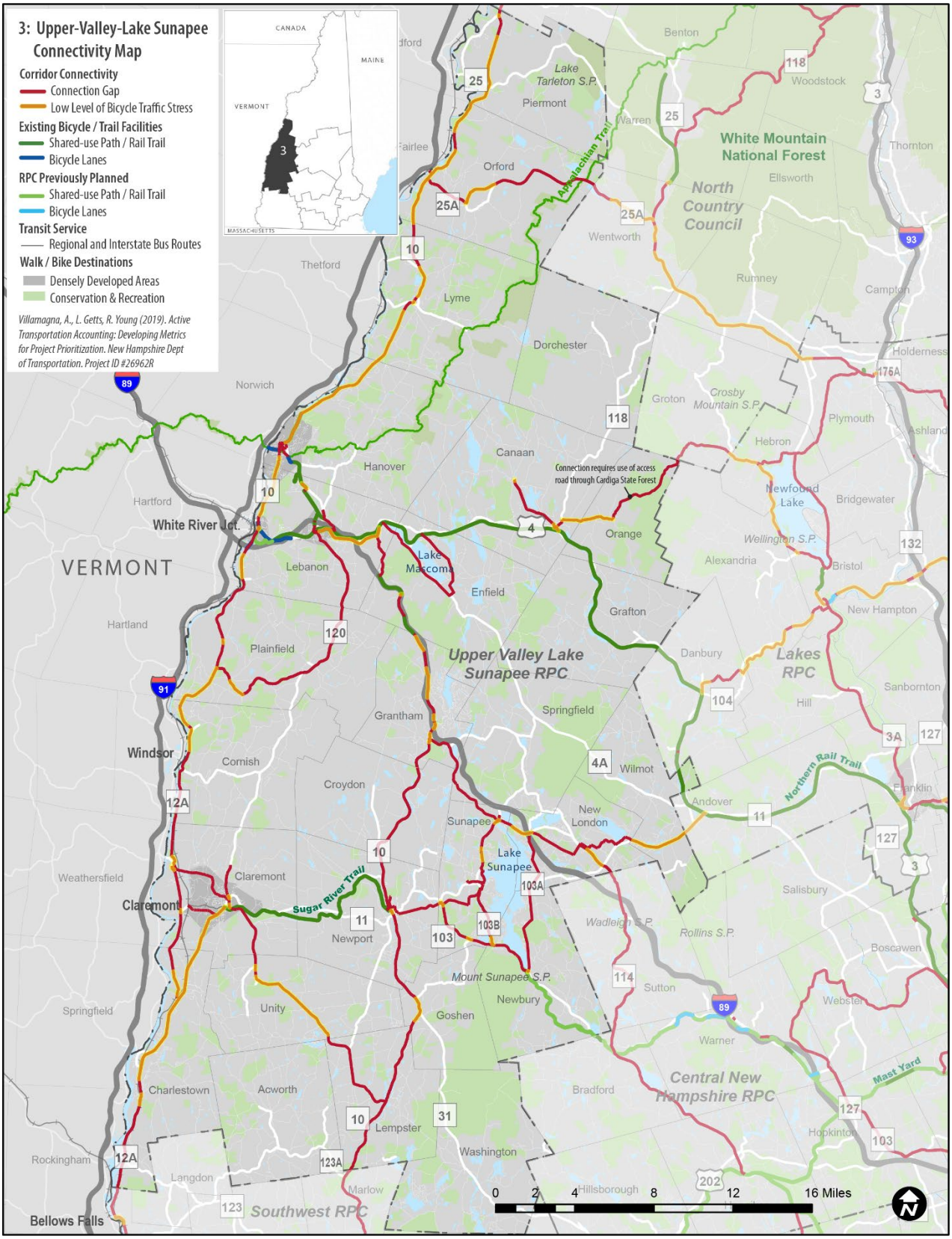
Map 18 - Bicycle Facility Connectivity Analysis Inset Map 1 – North Country



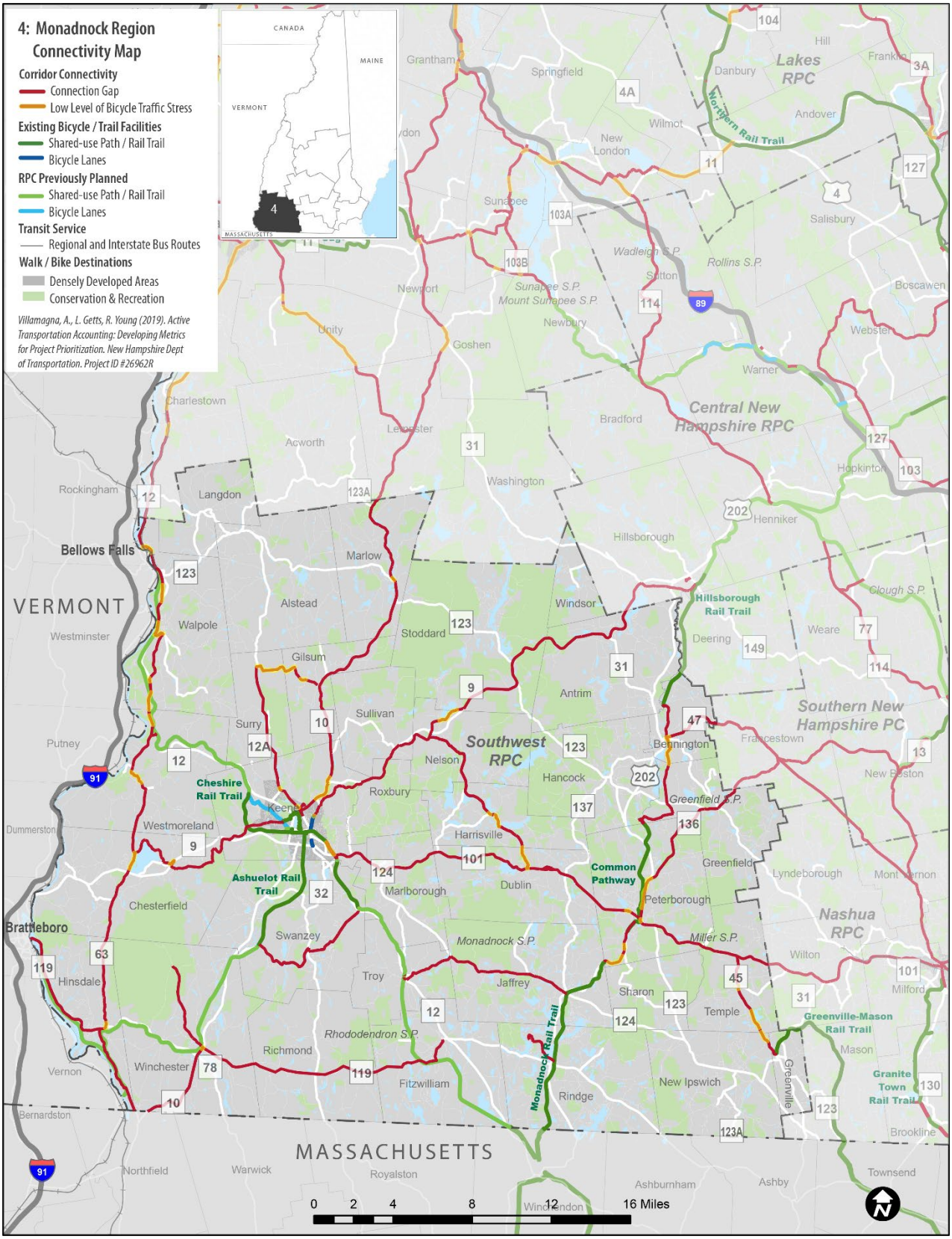
Map 19 - Bicycle Facility Connectivity Analysis Inset Map 2 – Lakes Region



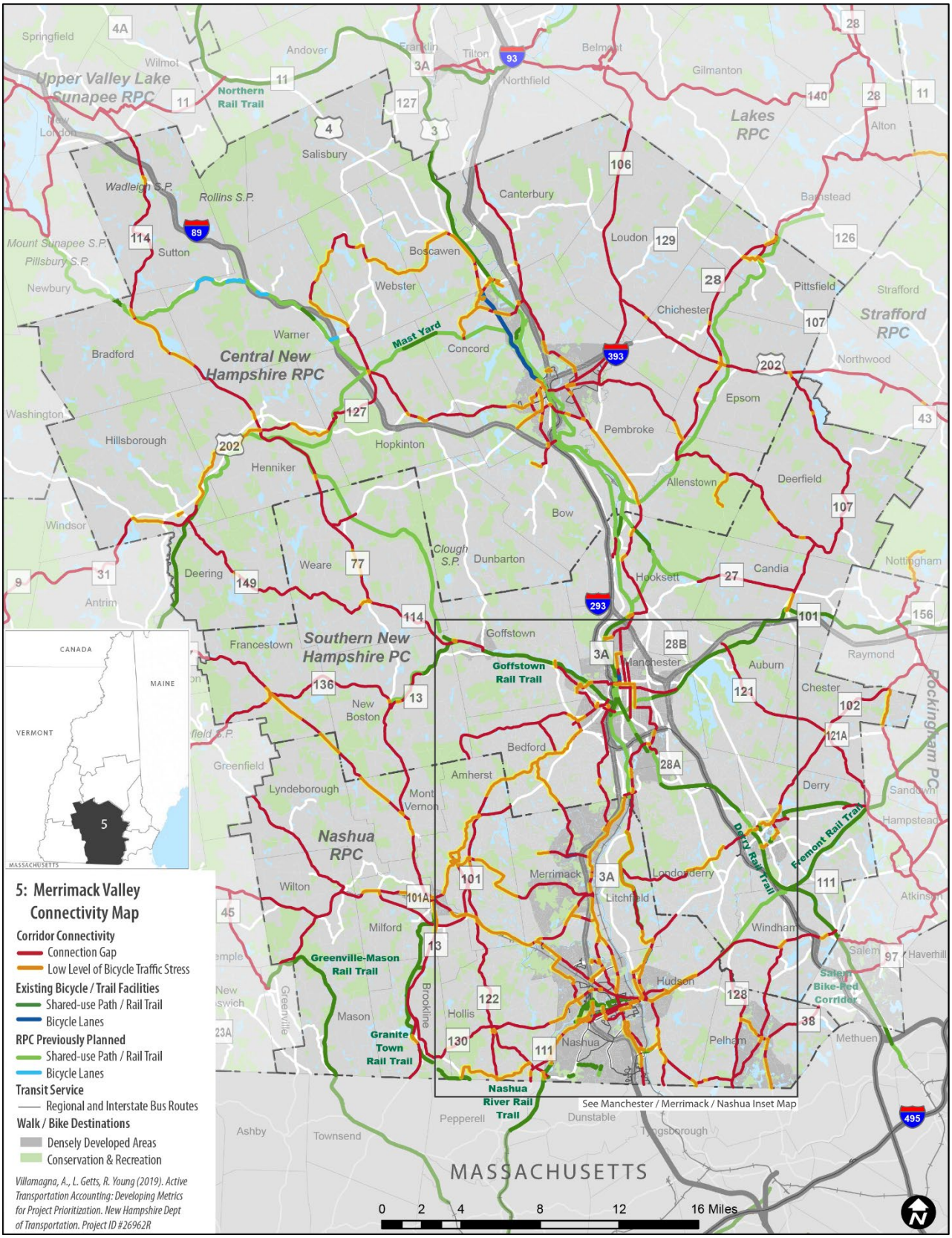
Map 20 - Bicycle Facility Connectivity Analysis Inset Map 3 – Hanover-Sunapee Region



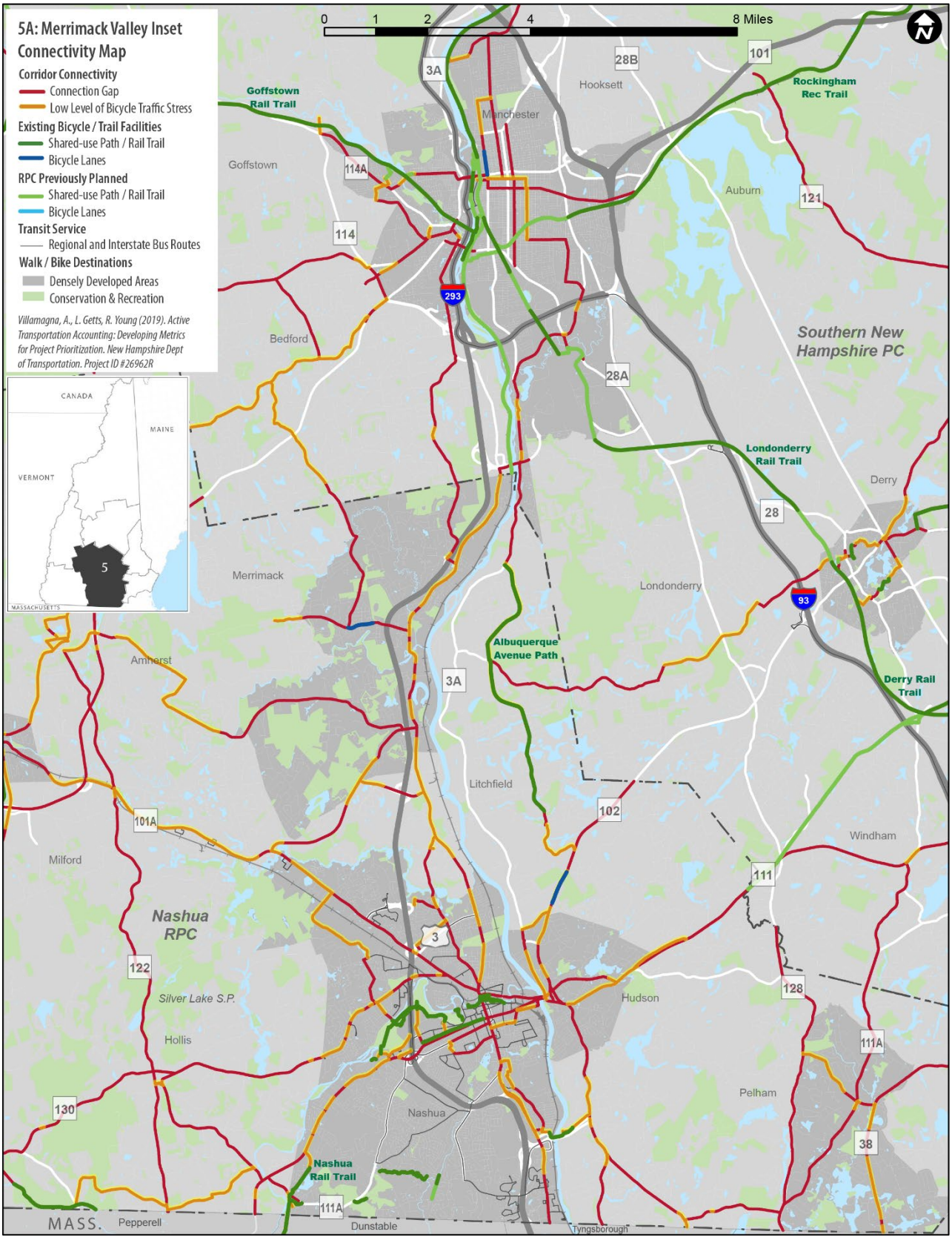
Map 21 - Bicycle Facility Connectivity Analysis Inset Map 4 – Monadnock Region



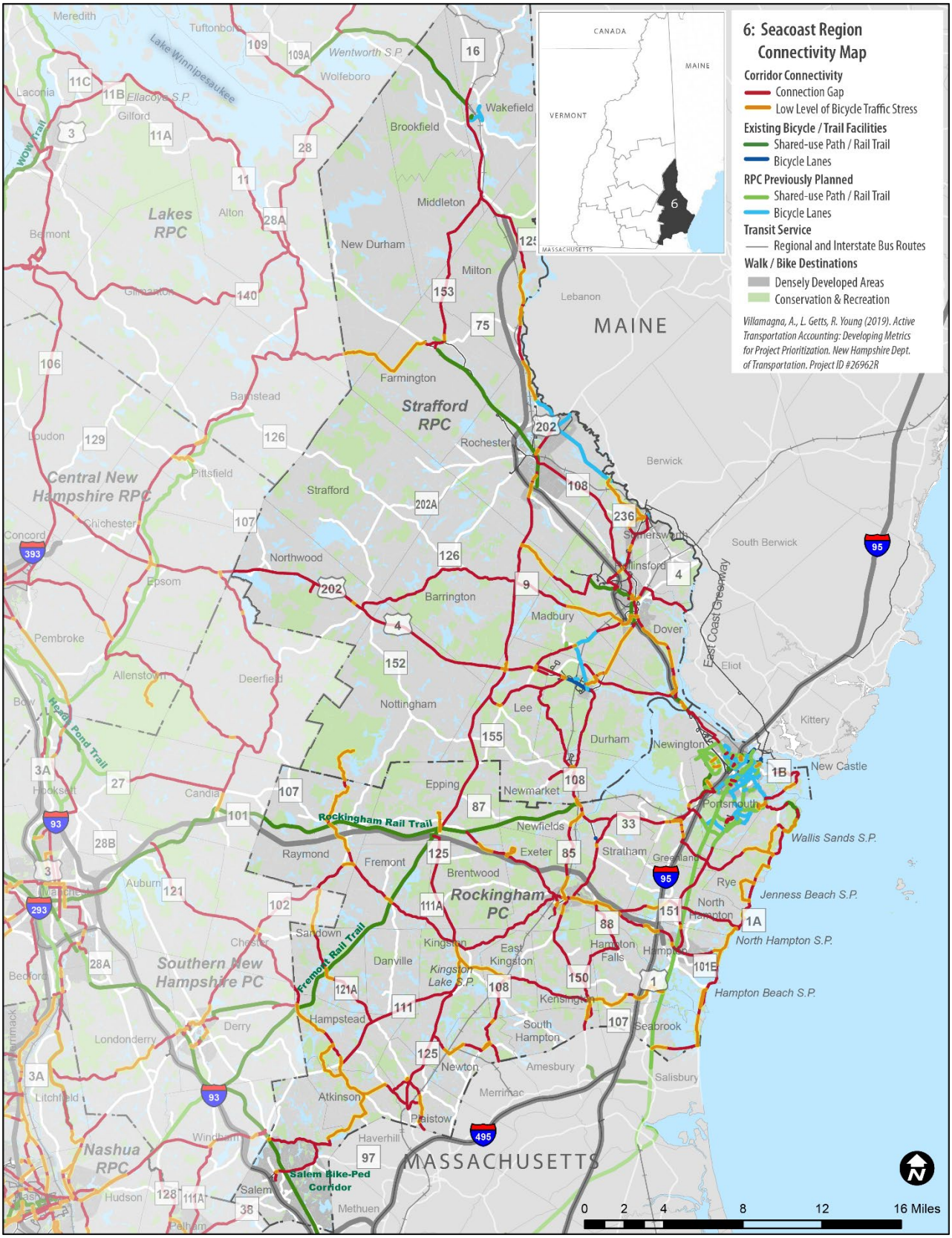
Map 22 – Bicycle Facility Connectivity Analysis Inset Map 5 – Merrimack Valley



Map 23 – Bicycle Facility Connectivity Analysis Inset Map 5A – Manchester-Nashua Inset



Map 24 – Bicycle Facility Connectivity Analysis Inset Map 6 – Seacoast Region



1.8 Pedestrian and Bicycle Crash Maps

Tracking crashes that involve pedestrians and bicyclists is important to identify potentially hazardous intersections and roadway segments where crashes are more likely to occur, due to lack of shoulders, poor sight lines or other factors. Comparing crash trends can help decision-makers better understand needed safety improvements across the state. To this end, the NHDOT Statewide Pedestrian and Bicycle Transportation Plan includes pedestrian and bicycle crash maps to inform planning-level network recommendations.

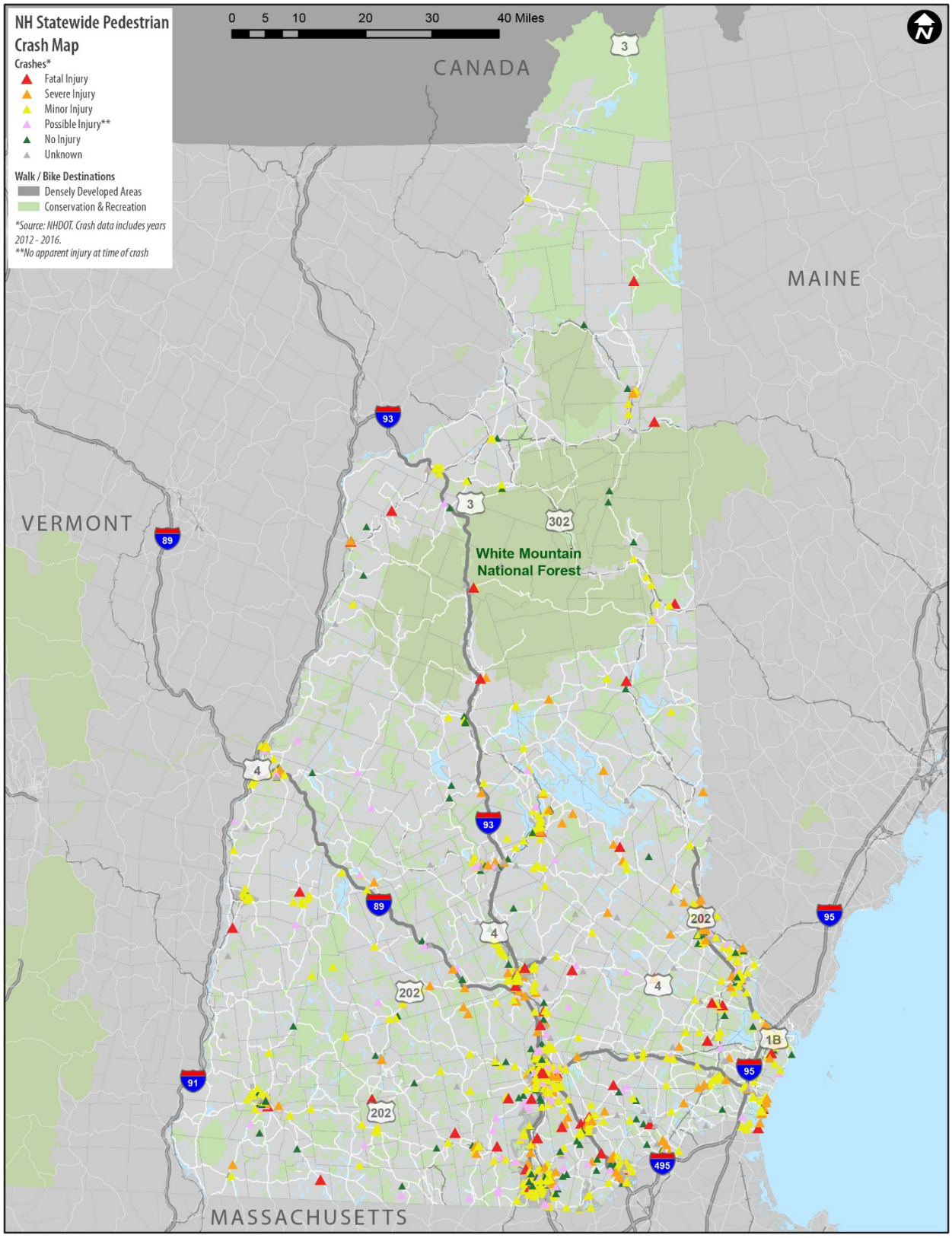
The crash maps on the following pages feature NHDOT data spanning a five-year period, starting on January 1, 2012 through December 31, 2016. Crashes were recorded on both state highways and local roadways. Crashes that resulted in no injury, an injury or a fatality are color-coded for clarity. The proximity of crashes will be used as a key criterion when prioritizing the list of pedestrian and bicycle facility projects by region. Road corridor recommendations will receive higher number of points in the "safety" category when there are recorded crashes within a ¼ mile buffer.

Seabrook, NH 1A (photo: Michael Hurst)

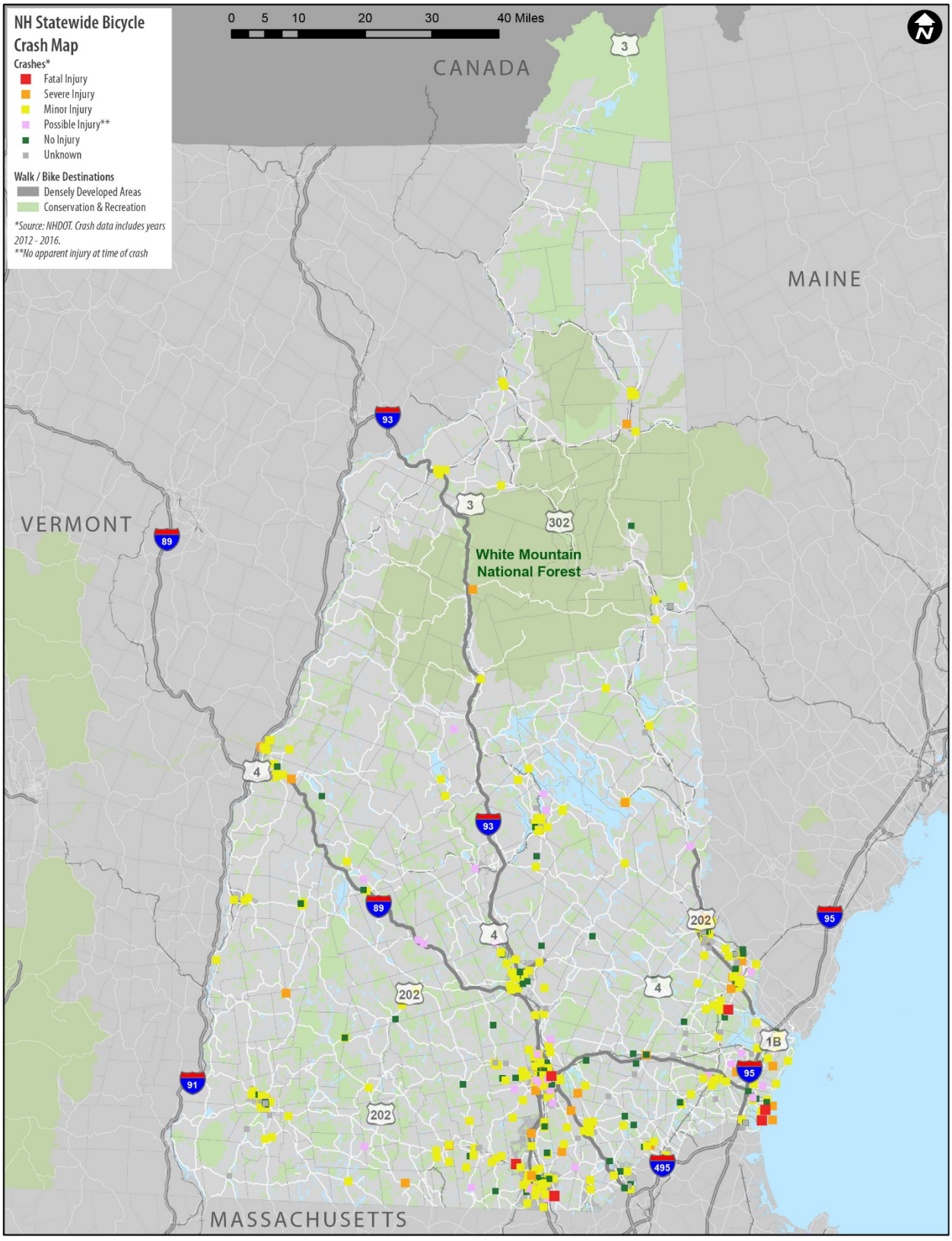
Table 2 – Statewide Crashes Involving Pedestrian and Bicyclists (NHDOT 2012-2016 data)

Type	Bike	Ped	*Total*
Fatal Injury	6	53	59
Severe Injury	36	169	205
Minor Injury	114	238	352
Possible Injury	363	741	1104
No Injury	94	266	360
Unknown	72	158	230
Total	**685**	**1625**	**2310**

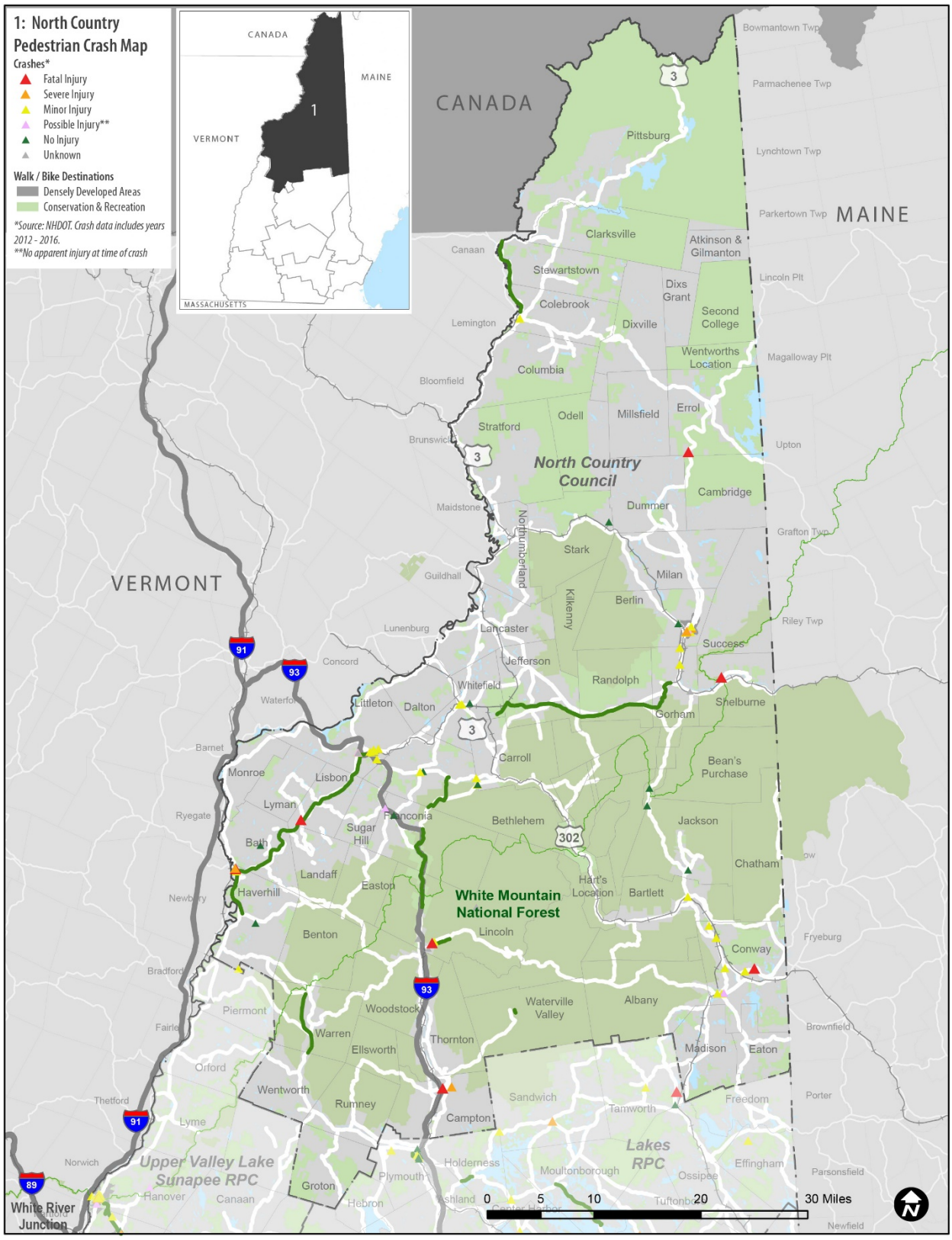
Map 25 – Pedestrian Crash Map – Statewide



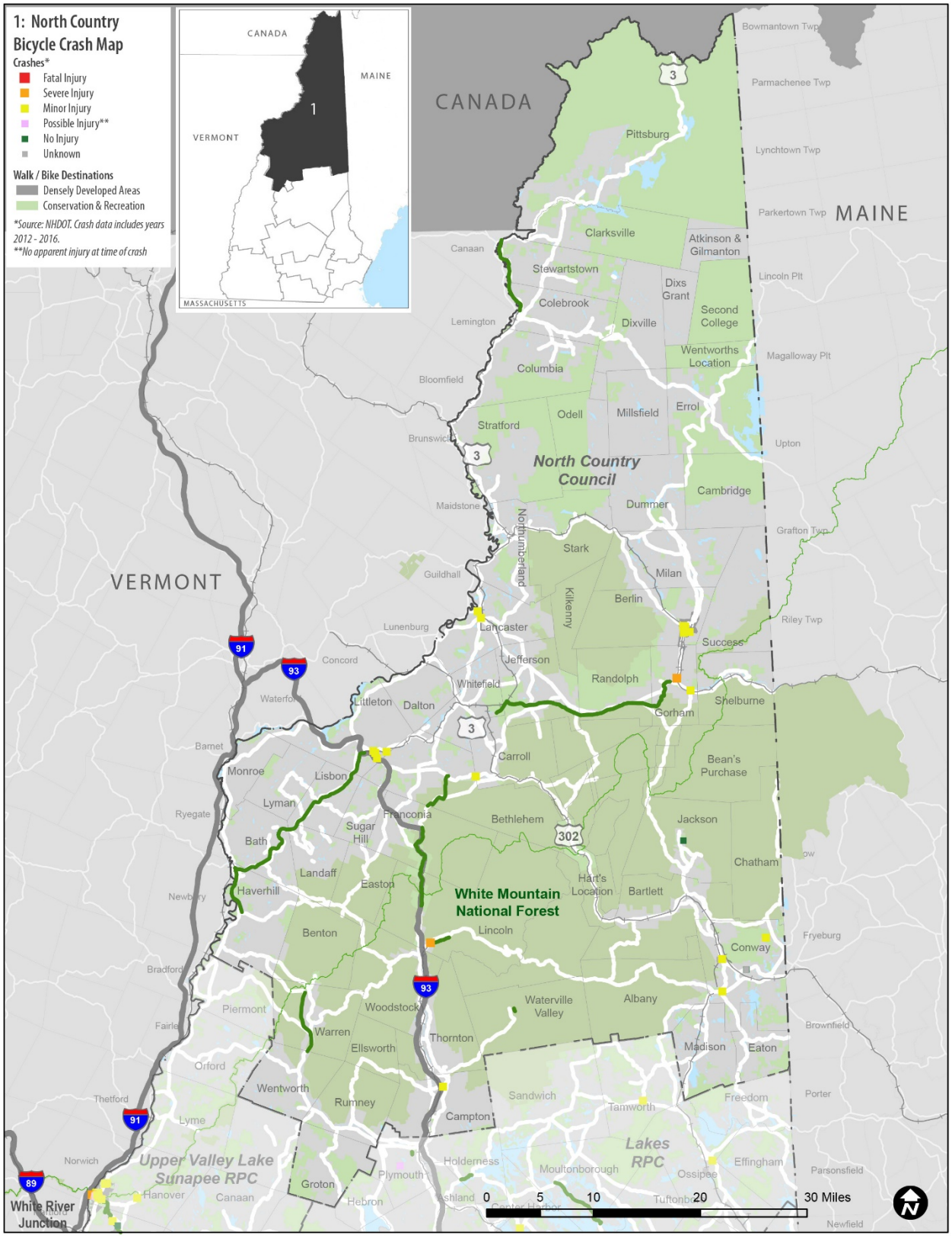
Map 26 – Bicycle Crash Map - Statewide



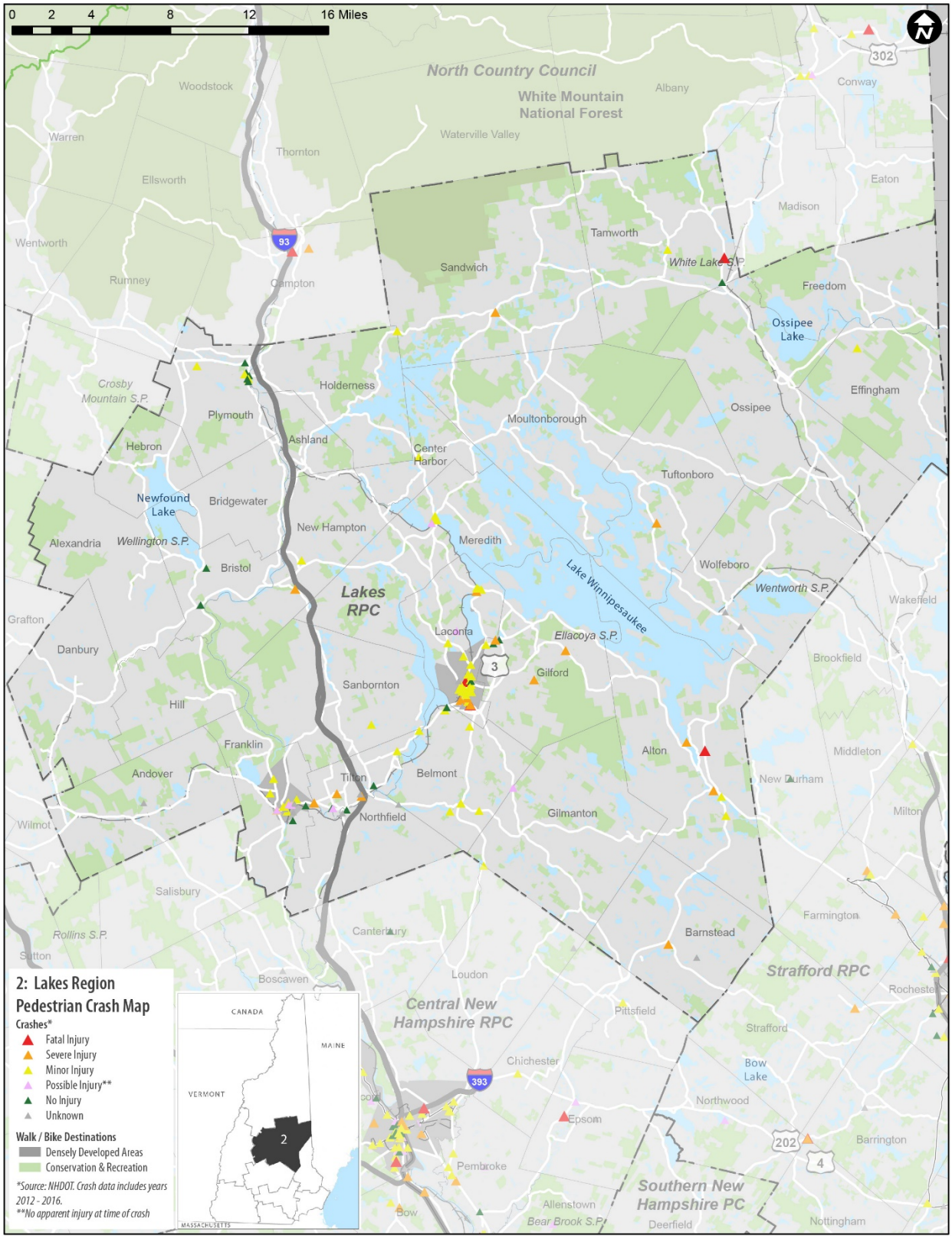
Map 27 - Pedestrian Crash Inset Map 1 – North Country



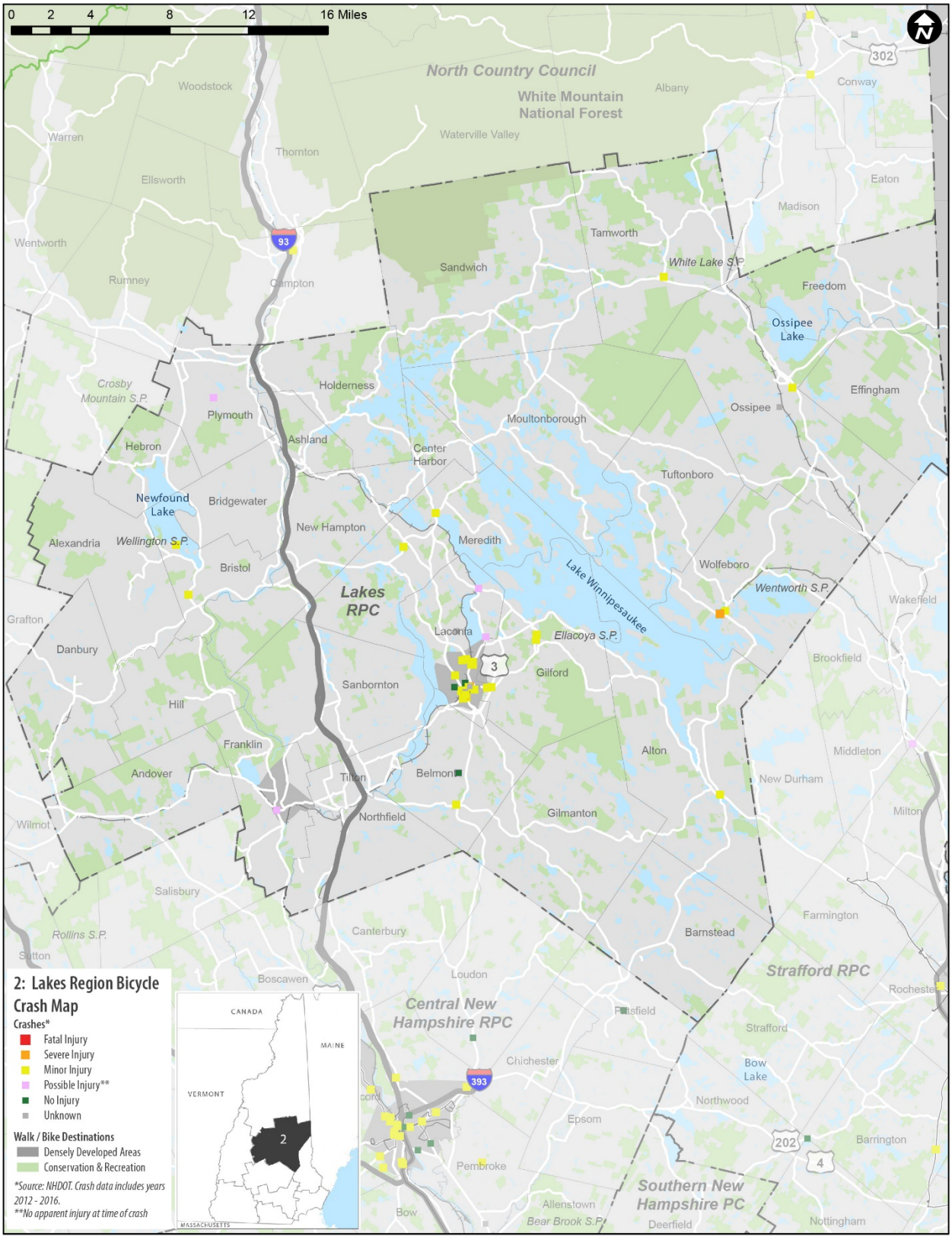
Map 28 - Bicycle Crash Inset Map 1 – North Country



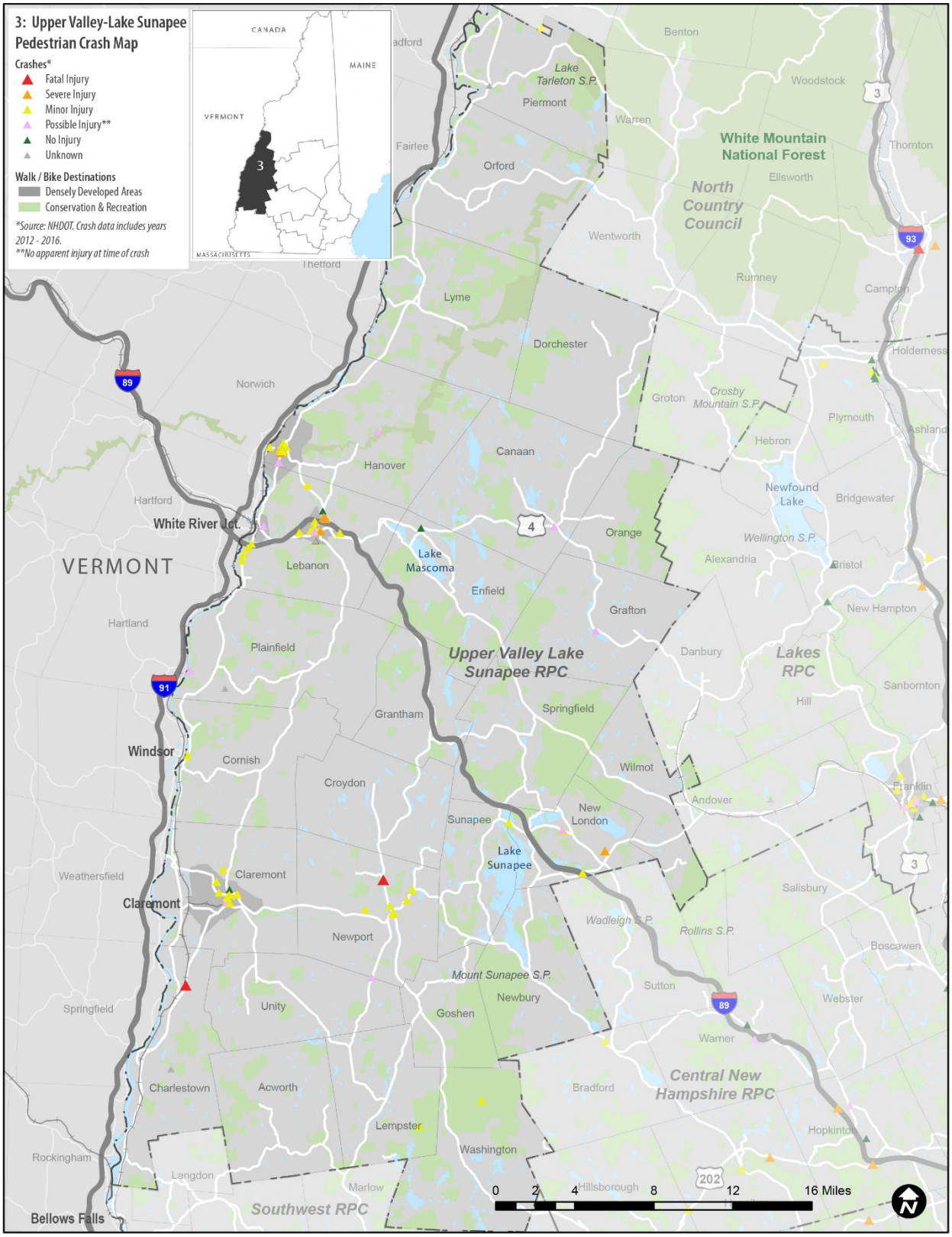
Map 29 - Pedestrian Crash Inset Map 2 – Lakes Region



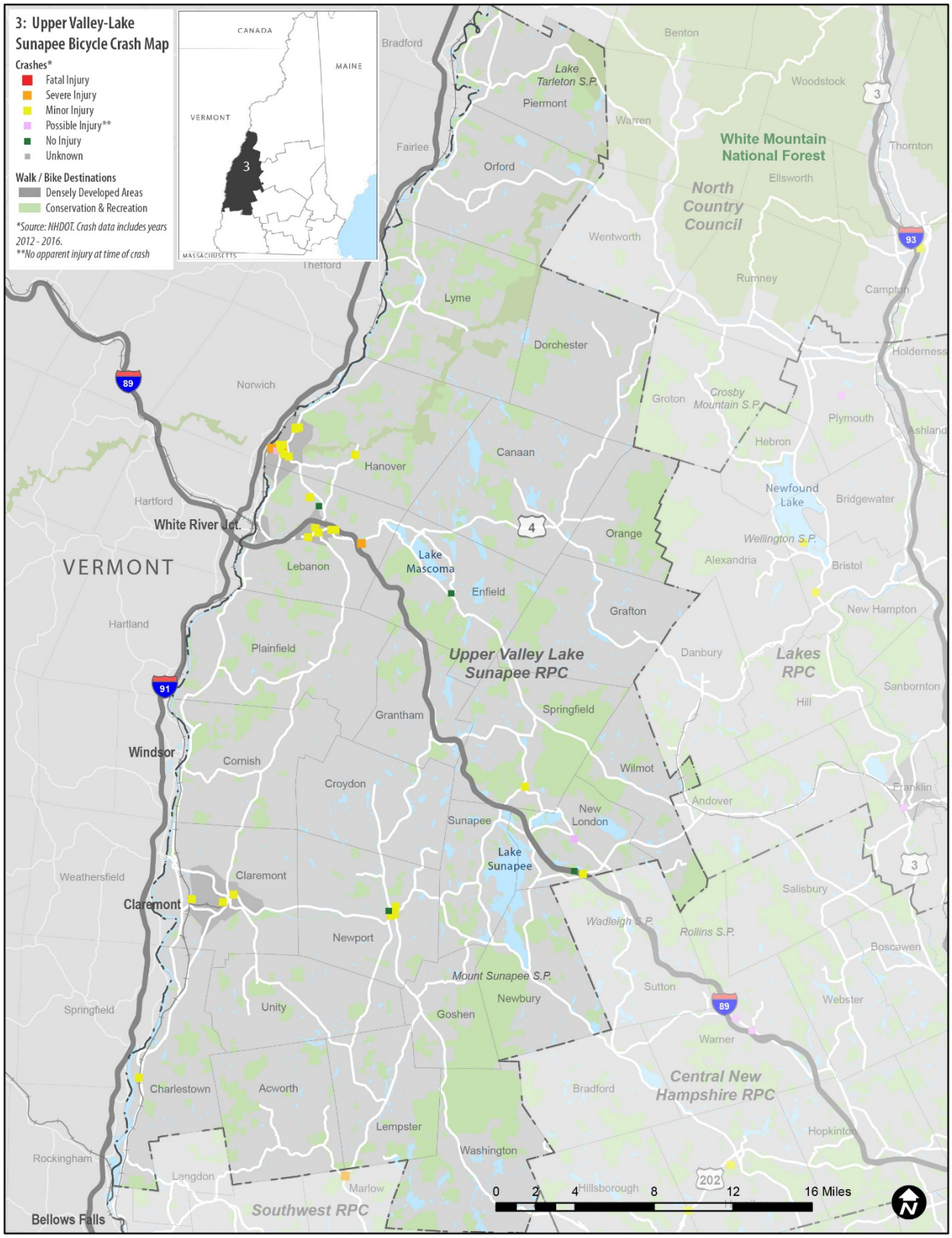
Map 30 - Bicycle Crash Inset Map 2 – Lakes Region



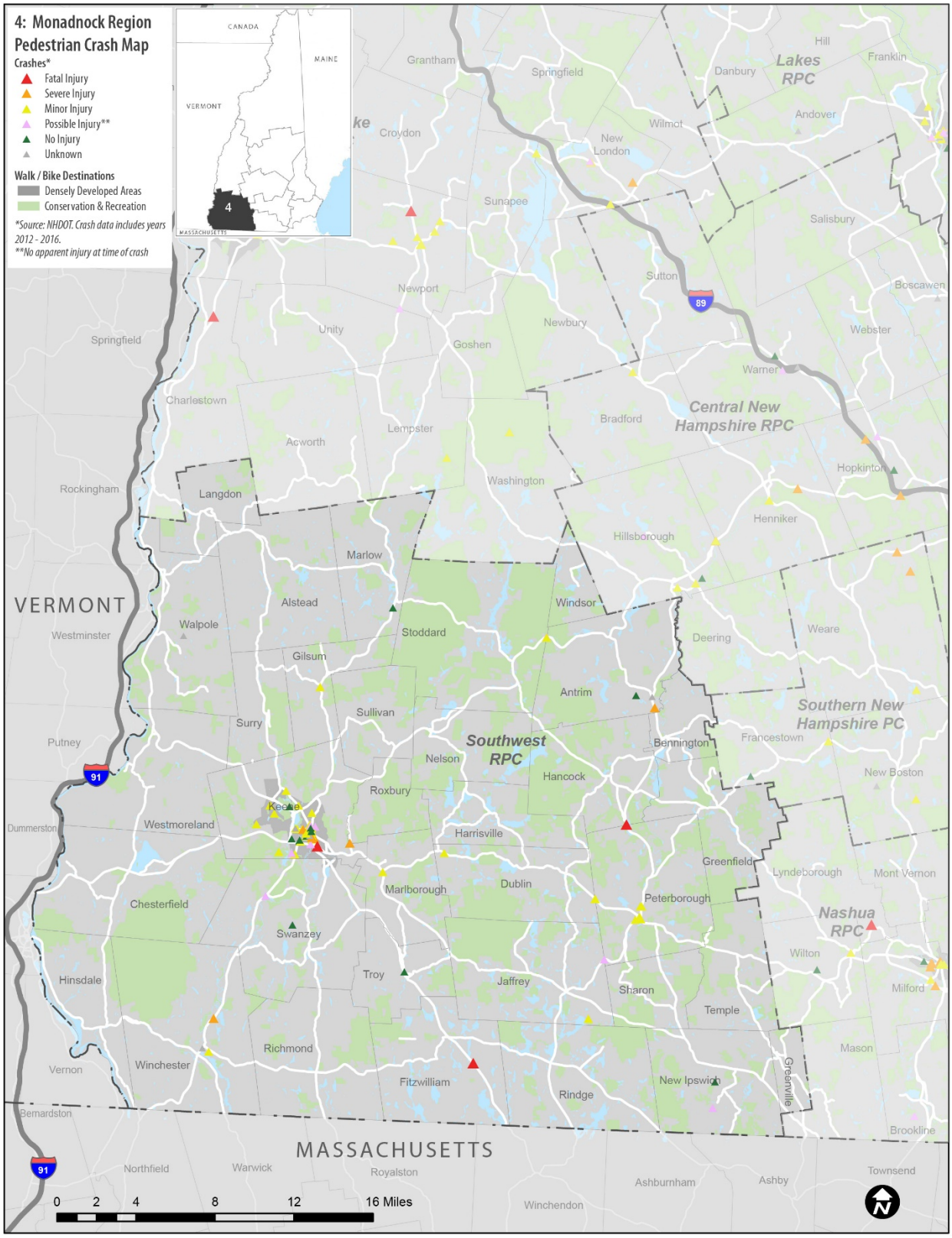
Map 31 - Pedestrian Crash Inset Map 3 – Hanover-Sunapee Region



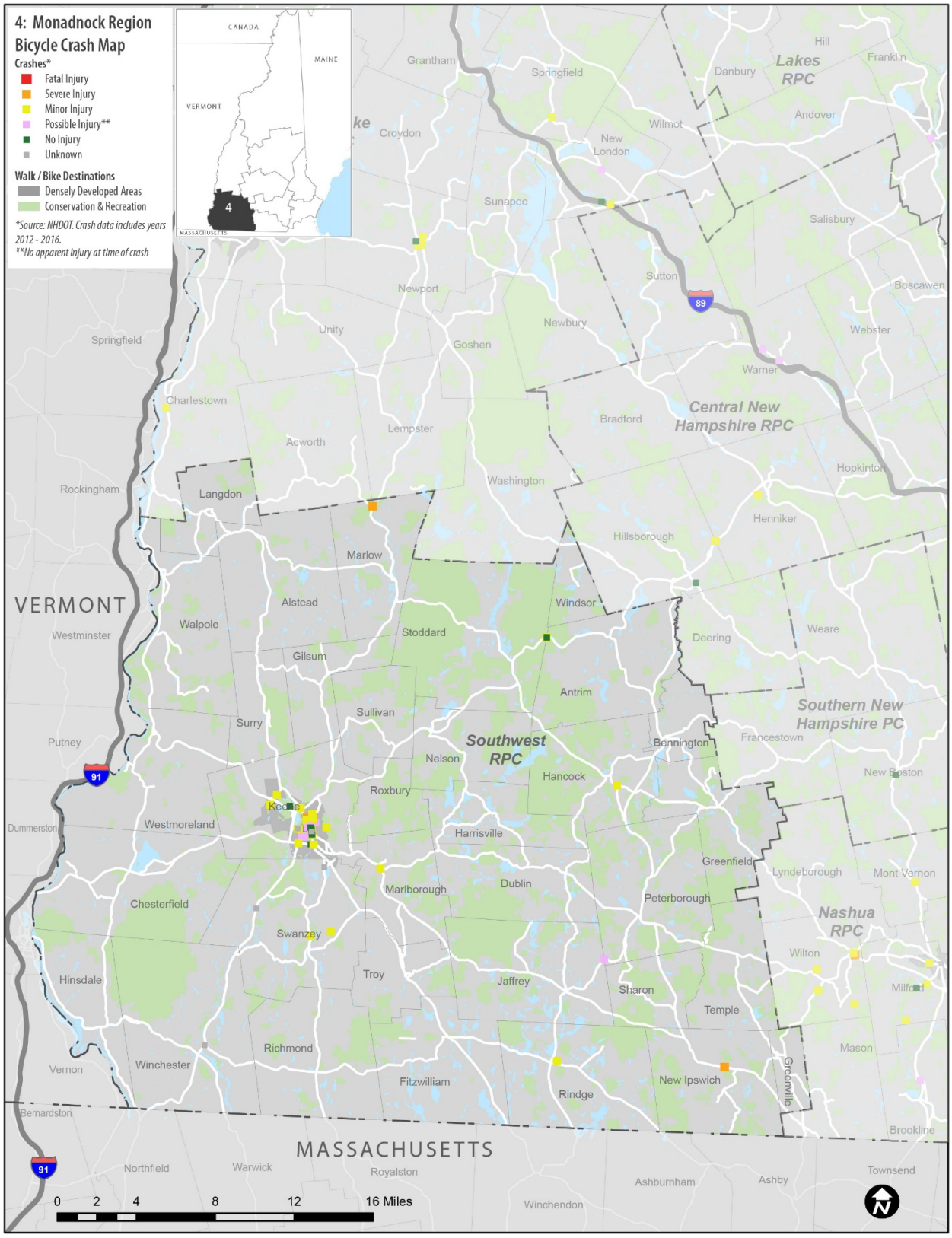
Map 32 - Bicycle Crash Inset Map 3 – Hanover-Sunapee Region



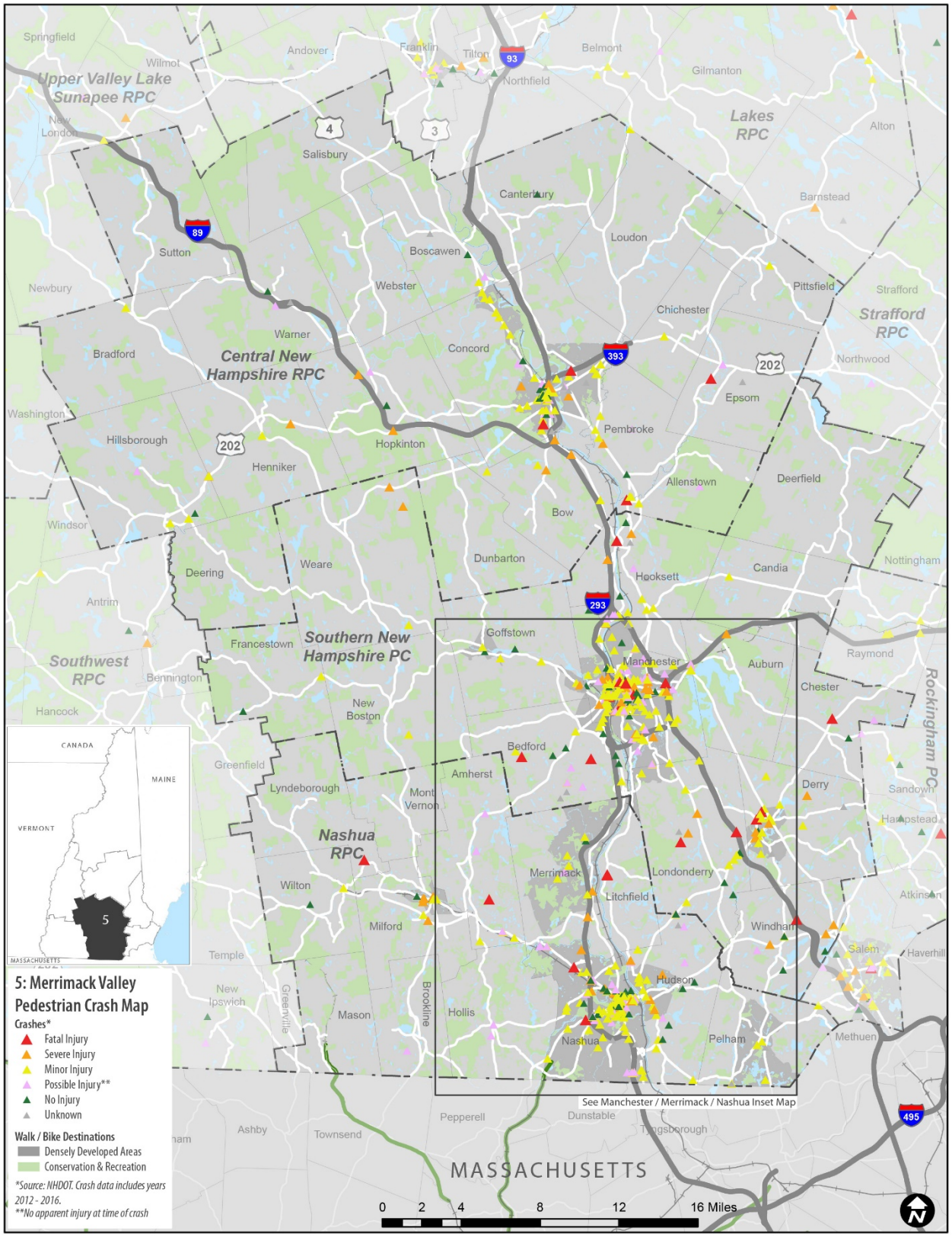
Map 33 - Pedestrian Crash Inset Map 4 – Monadnock Region



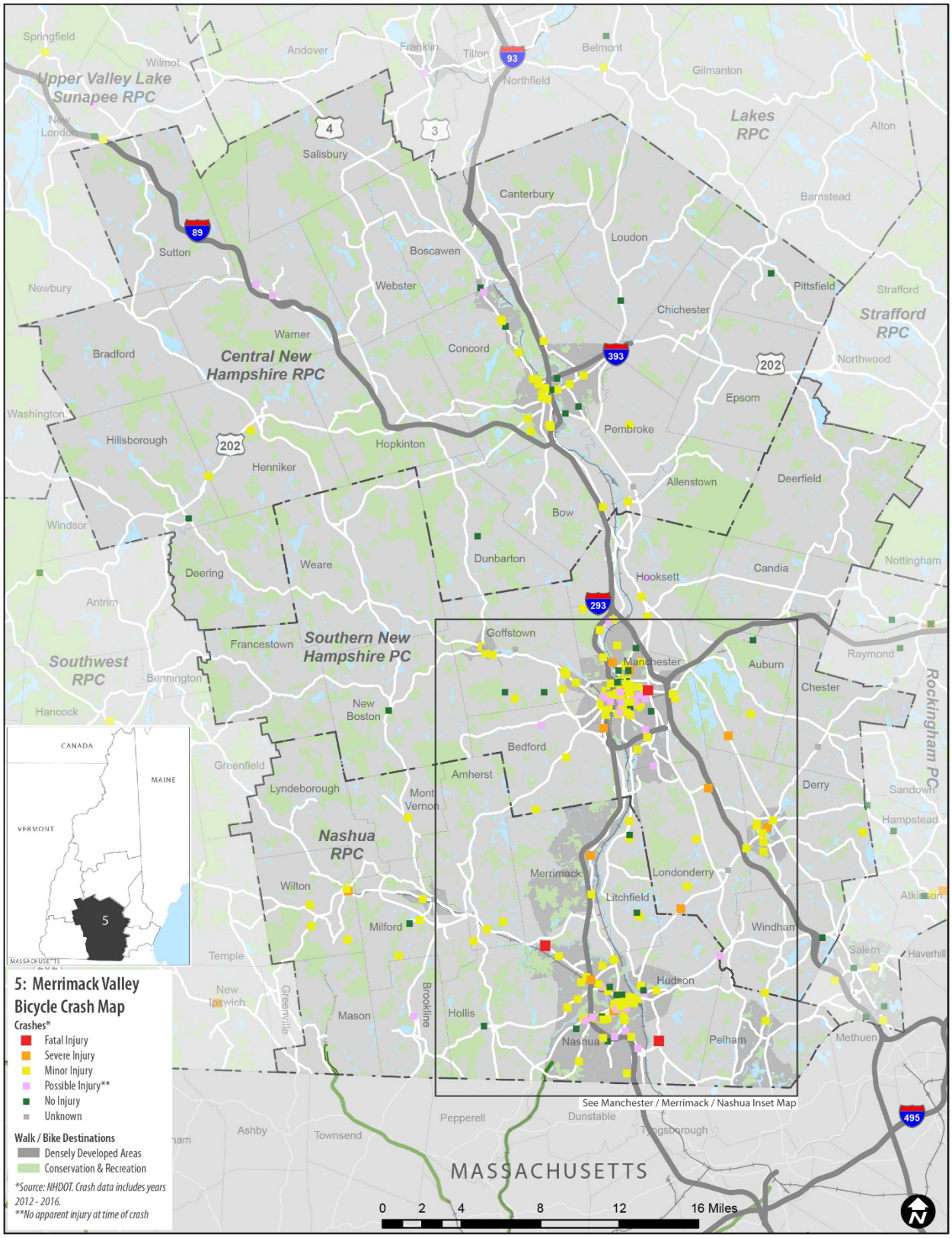
Map 34 - Bicycle Crash Inset Map 4 – Monadnock Region



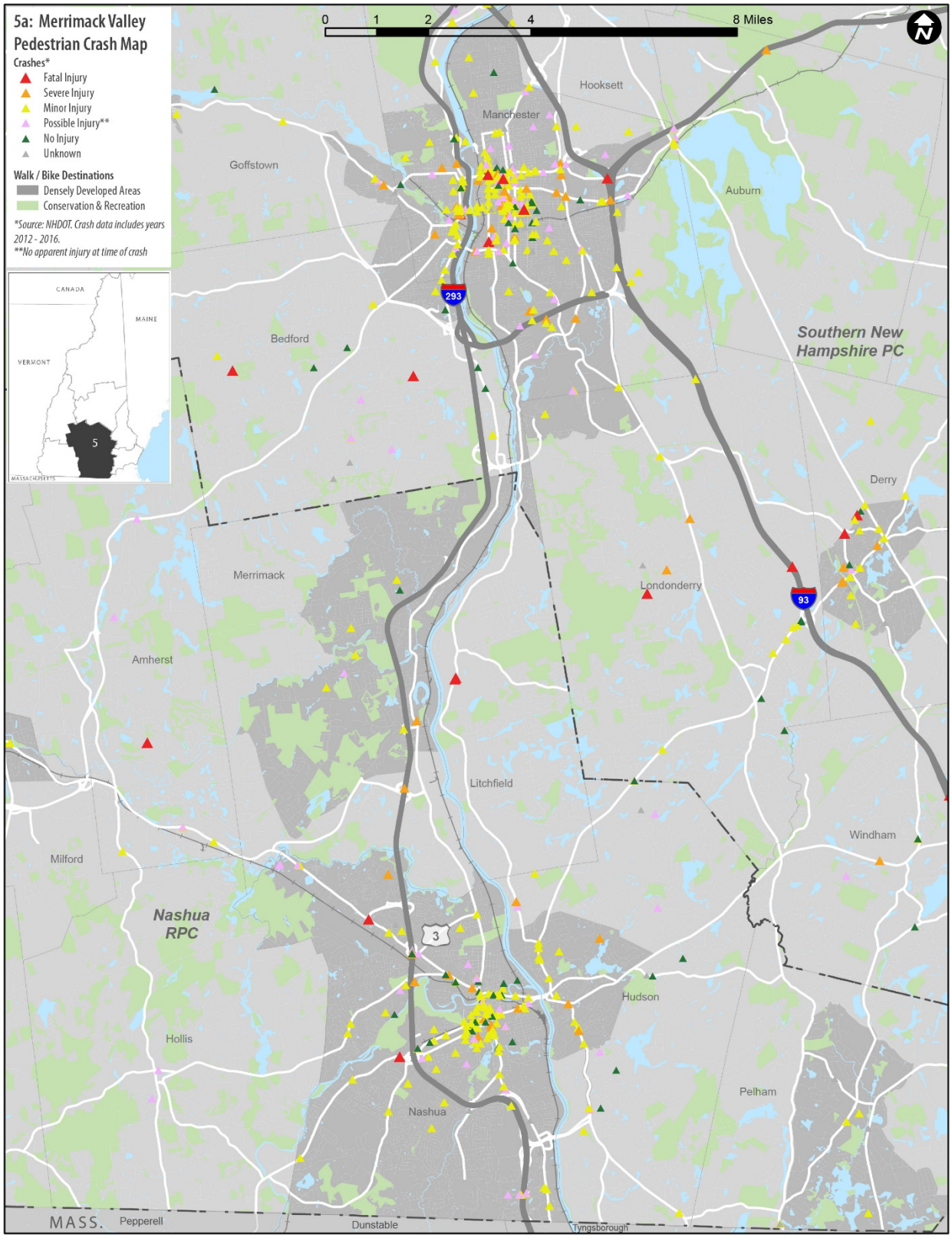
Map 35 – Pedestrian Crash Map 5 – Merrimack Valley



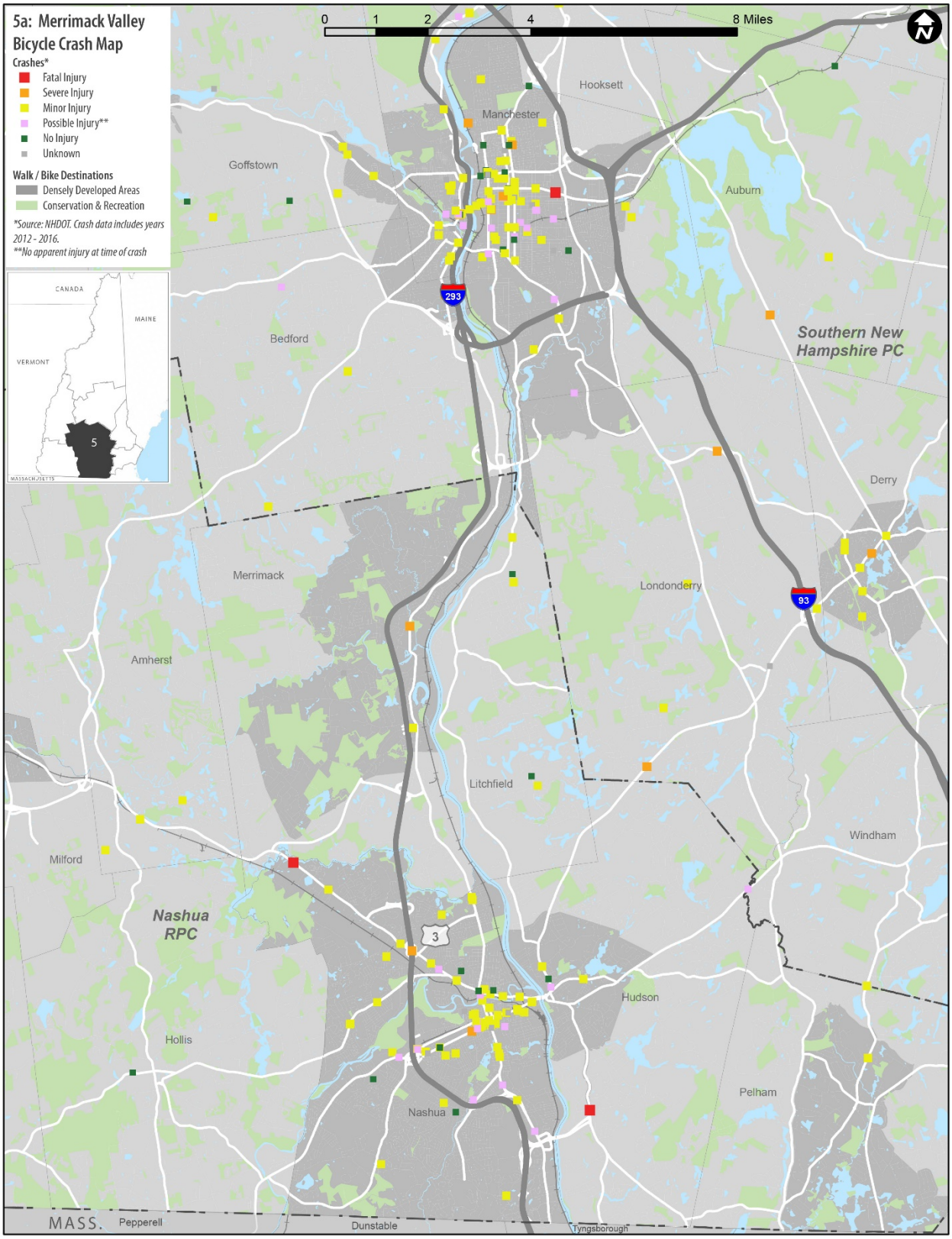
Map 36 – Bicycle Crash Map 5 – Merrimack Valley



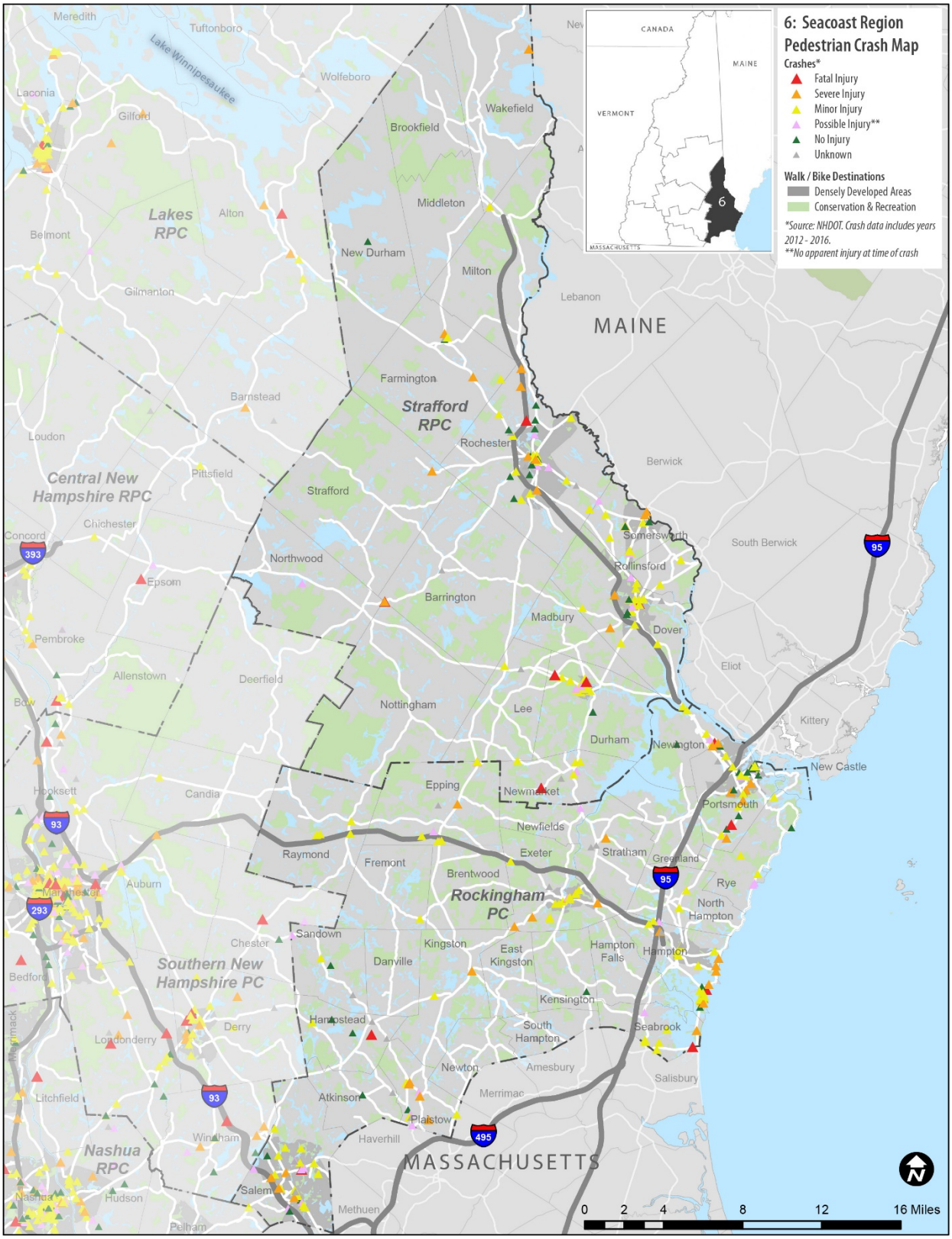
Map 37 – Pedestrian Crash Map 5A – Manchester-Nashua Inset



Map 38 – Bicycle Crash Map 5A – Manchester-Nashua Inset



Map 39 – Pedestrian Crash Map 6 – Seacoast Region



Map 40 – Bicycle Crash Map 6 – Seacoast Region

1.9 Vision, Goals & Objectives, and Performance Measures (TBD)

The State of New Hampshire strives to increase walking and bicycling by residents, workers, and visitors of all ages and abilities. The Plan's vision, goals and objectives will guide the planning, funding and implementation of improved pedestrian and bicycle safety and access, and inform transportation-related policies and programs. In aggregate, these improvements will bring significant quality-of-life benefits to the State of New Hampshire and for all users of state highways and local roadways.

1.9.1 Definitions

A **Vision** is a broad statement, both inspirational and aspirational, that defines the desired future state of walking and bicycling in New Hampshire.

Goals are general statements of what the people who live, work or visit New Hampshire hope to achieve over time.

Objectives are more-specific action items that will help to achieve the goals.

Performance Measures are typically annual data-driven benchmarks that help the state gauge progress towards the Plan's goals and objectives.

Critical Stakeholders are 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.

Other various terms used include:

- **Pedestrian** – includes people walking, running, jogging, using a wheelchair or mobility-assist device, and transit users
- **Walk/Bike Network** – a collection of facilities designed to provide spaces for walking and bicycling, which includes roadway shoulders, sidewalks, trails and bike lanes
- **State Highways** – roadways owned and maintained by the NH Department of Transportation, both numbered and unnumbered
- **All Ages and Abilities** – pedestrian and bicycle facilities designed for a high level of comfort and safety, typically separated from motor vehicle traffic
- **Complete Streets** – roadways that provide safer access for all road users, including motorists, pedestrians, bicyclists and transit users
- **ADA** – Americans with Disabilities Act, which requires access for people with a wide range of disabilities
- **Underserved Communities** – includes neighborhoods and groups of people who are lower income and typically more dependent on transit, bicycling and walking than the New Hampshire average

1.10 Summary of Previous Plans, Studies and Reports

In the past ten years, the State of New Hampshire and the Regional Planning Commissions have developed a number of plans, studies and reports that aim to improve transportation, open space or development patterns in some way, shape or form. Analysis and recommendations found in these reports reference ways to improve walking and bicycling in local communities, regions and statewide. This section provides a summary of the myriad policy, program and project recommendations that can inform the planning work and recommendations in the New Hampshire Statewide Pedestrian and Bicycle Transportation Plan.

1.10.1 Introduction

The state's nine Regional Planning Commissions (RPC) develop a regional Transportation Improvement Program (TIP) every two years using input from member municipalities, NHDOT, and each RPC's Transportation Advisory Committee (TAC). This occurs at the same time as the NHDOT State Transportation Improvement Program (STIP) as well as the Ten-Year Plan update (TYP).

The New Hampshire Ten Year Transportation Plan lists the transportation projects and programs for the state over a ten-year period. The Ten-Year Plan is revised on a two-year cycle with input from a variety of stakeholders. The Legislature then reviews the Ten-Year Plan prior to being approved by the Governor. The approved TYP provides the foundation for the first four years of project funding through the State Transportation Improvement Program (STIP).

1.10.2 Funding Stipulations

State and federal funding sources for local bicycle and pedestrian transportation are limited. The Transportation Enhancement (TE), Recreation Trails Program (RTP), and Safe Routes to Schools (SRTS) programs, have been consolidated into one program called Transportation Alternatives Program (TAP).

New Hampshire receives roughly $7.5 million in TAP funding every two years. One third of that funding is set aside for Recreational Trail projects administered by the NH Department of Natural and Cultural Resources. Federal guidelines require another portion of the funding be set aside exclusively for the Nashua region. The remaining pot of funds is used to pay for TAP projects in each of the nine RPC's. Depending on project cost, each RPC typically receives funding for one or two TAP projects every two years.

Bicycle and pedestrian infrastructure projects may be eligible for funding through the Federal Highway Safety Improvement Program (HSIP). To be eligible, the project must be in a location with a documented history of fatal or severe crashes involving bicyclists or pedestrians. Road Safety Audits (RSA) should be completed as a precursor to potential HSIP funding.

1.10.3 Report Summaries

A total of nine regional reports and four statewide plans and reports were analyzed and summarized in the pages below. They include:

Jurisdiction	Summarized Reports
1. North Country Council RPC	1: Regional Transportation Plan 2015 Update, June 2015
2. Lakes RPC	2: Transportation Improvement Program, April 2015 2.1: Lakes Region Plan, 2015 - 2020
3. Upper Valley Lake Sunapee RPC	3: UVLSRPC Regional Plan 2015, A Guide for The Future Development of The Upper Valley Lake Sunapee Region, June 2015
4. Southwest RPC	4: Southwest Connects: Southwest Transportation Plan 2015 – 2035, January 2015
5. Central New Hampshire RPC	5: Transportation Improvement Program FY 2019-2028, April 2017 5.1: Regional Trails Plan 2012, Salem-Manchester-Concord, January 2013
6. Southern New Hampshire PC	6: Southern New Hampshire PC, FY 2017 – FY 2040 Regional Transportation Plan, January 2017
7. Nashua RPC	7: Metropolitan Transportation Plan, 2015 – 2050, December 2014 7.1: The Nashua Region: A Story Worth Telling
8. Rockingham RPC	8: 2040 Long Range Transportation Plan, October 2017
9. Strafford RPC	9: Metropolitan Transportation Plan 2017 – 2040, December 2017
10. Statewide Plans	10.1: NH Outdoors 2019 – 2023 Statewide Comprehensive Outdoors Recreation Plan (SCORP) 10.2: Granite State Future, The Statewide Snapshot, June 2015 10.3: NH State Development Plan, NH in The New Economy: A Vision for Expanded Prosperity 10.4: Your Guide to Promoting Walking and Bicycling Accommodations in New Hampshire 10.5: NH Long Range Transportation Plan, July 2010 10.6: NHDOT Strategic Highway Safety Plan, 2017

1. North Country Council RPC - Regional Transportation Plan 2015 Update, June 2015

The plan identifies the region's high priority needs and develops strategies to meet those needs. The plan is a policy document that acts as a guide for the North Country Council RPC, NHDOT, and member communities to allocate funding for transportation projects. More specifically, the Regional Transportation Plan will help their TAC prioritize projects for federal and state funding.

The report advises North Country communities to focus on projects that align with the priorities of the Federal Moving Ahead for Progress in the 21st Century Act (MAP-21) due to the increasing competitiveness of funding rounds in the future. The MAP-21 priorities included "improving safety,

maintaining the condition of existing infrastructure, reducing traffic congestion, making improvements to make transportation systems more efficient, improving and protecting the environment, and improving bike and pedestrian options to improve livability in states and regions." (pg. 8)

Projects that were eligible for the 2014 application cycle included[26]:

- Construction planning, and design of on-road and off-road trail facilities for pedestrians, bicyclists, and other non-motorized forms of transportation
- Construction, planning, and design of infrastructure-related projects and systems that will provide safer routes for non-drivers, including children, older adults, and individuals with disabilities to access daily needs
- Conversion and use of abandoned railroad corridors for trails for pedestrians, bicyclists, or other non-motorized transportation users
- Eligible Safe Routes to School program infrastructure activities eligible under Section 1404 of SAFETEA-LU

During the public outreach process, participants were given twelve answers to rank under the question "What should be actively encouraged in your community?" Coming in second place, at 84%, was "Promoting safe places to walk or bike."

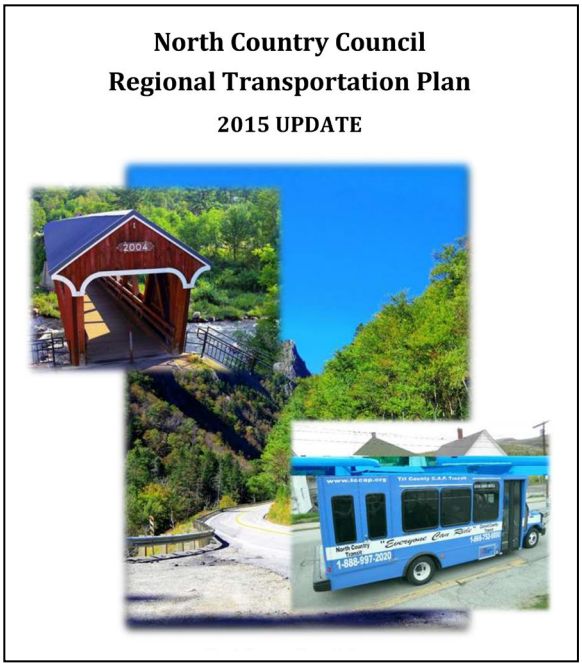
Fifteen goals were developed to promote bicycle and pedestrian infrastructure in the North Country:

1. Pedestrians and bicyclists should have safe and adequate access along public roads in villages and downtown areas as well as links to critical facilities such as schools and other destinations
2. Local and regional organizations should enhance existing infrastructure and plan for future infrastructure that would allow for safe and comfortable bicycle and pedestrian travel
3. Towns and schools should work with NCC and the NHDOT on programs and infrastructure to fund safe routes to schools.
4. When possible, municipalities and state agencies should acquire enough right-of-way during roadway construction and reconstruction projects to accommodate safer bicycle and pedestrian systems.
5. All sidewalks and crosswalks should provide safe mobility for all users and should be properly aligned and have sloped handicapped ramps.
6. All future development of retail and service centers should incorporate pedestrian access to minimize conflicts with vehicles.
7. Educational programs should be offered through towns, schools, and other advocacy agencies to promote safer walking, bicycling, and driving.
8. NCC should work with towns, state agencies, and local organizations to coordinate bicycle and pedestrian facilities.
9. Transit providers should consider installing bicycle racks on vehicles.

[26] Note that since 2014, the Fixing America's Surface Transportation (FAST) Act has now become law, supplanting previous legislation called MAP-21. The FAST Act's set-aside funding requires that some portion of funds be reserved for trails. Of the remaining non-trail funds, at least 50% must be distributed based on population density with the remainder able to be distributed anywhere in New Hampshire.

10. State agencies should work with partners to maintain and continue to improve maps and brochures of bicycle routes that include enhanced information regarding which routes are "family friendly."
11. State agencies should work with local partners to encourage multiple uses of rail corridors when appropriate, including recreational use with active rail.
12. Trail-related improvements to abandoned rail corridors should continue even if rail service may return in the future. Improvements such as drainage and brush clearing are consistent with state policy on rail preservation.
13. Federal and state agencies and local partners should work together to provide adequate access to recreational trails for bicycles and pedestrians, including parking where appropriate and necessary.
14. NCC will work with local planning boards to review and update master plans in order to accommodate bicycle and pedestrian travel.
15. NCC should stay abreast of the needs of the disabled and associated ADA requirements, including Segway use, and encourage integration into bike/pedestrian facilities (including paths/trails and access).

The report then breaks the NCC into Labor Market Areas, and each has a series of maps and other information including deferred projects, recommended projects, etc.



In the Issues, Needs, and Priorities write-ups, public comments related to walking + bicycling include:

- Sidewalks were not safe in the winter, and there are safety concerns about children walking to and from school. (Berlin)
- Many roads are not pedestrian friendly, have to drive from place to place. (Conway)
- Desire for more bike paths (Carroll)

Priorities include:

- Increasing shoulder width to 4 – 5 feet as part of repaving projects, particularly on:
  - US 3, NH 26, and NH 145, to accommodate bicycle and pedestrian safety
  - US 2, NH 16, NH 26, and NH 110 as part of future projects
  - all Arterials and NH 116 from Littleton to Whitefield
  - NH 10, NH 112, and NH 25 whenever possible as part of repaving projects
- Pedestrian safety improvements are needed in downtown Colebrook and West Stewartstown between residential neighborhoods and the school (TAP funding proposed) (Berlin)
- Establish sidewalks and crosswalks for patrons to move from Santa's Village to the to overflow parking to the amusement park (Littleton)

Pedestrian / Bicycle related projects proposed by member communities include:

- Rebuild 5,000 feet of US 3 / Main Street in Colebrook with ADA compliant sidewalks and drainage replacement and install a bike lane. (Berlin)
- Conway Village Streetscape project: including sidewalk upgrades, crosswalks, utility relocation, landscaping, lighting and gateway markers. (Conway)
- Restructure traffic approaches at US 3 / Main Street at Church Street in Northumberland. (Littleton)
- Bike and pedestrian improvements are needed at the King's Square area on US 3. The project includes construction of 1,650 feet of new sidewalk in Whitefield. (Littleton)
- Upgrade the geometry at the US 302/NH 135 intersection to improve safety.
- Plymouth/Lincoln sub-region: expand shoulders on NH 118, NH 112 east of NH 118, and all of NH 175, and portions of NH 25. (The "Plymouth Commuter shed Number of Unique Cyclists" map displays Strava data that indicates more than 100 bicyclists rode from Campton and Thornton to Plymouth and to Waterville Valley. The lack of adequate paved shoulders presents safety hazards to bicyclists and drivers.)

The Plan concludes with a recommendation to alter the sparse land use patterns (with some exceptions, e.g. the US 3 corridor) in Northern New Hampshire and move towards a Smart Growth orientation to development.

2. Lakes Region Transportation Improvement Program, April 2015

The Lakes Region RPC TAC voted in April, 2015 to maintain the region's six existing TYP projects as regional priorities. The report notes that it is challenging to secure funding for even high priority transportation projects and acknowledges that funding through the TYP program does not satisfy the cost of the projects.

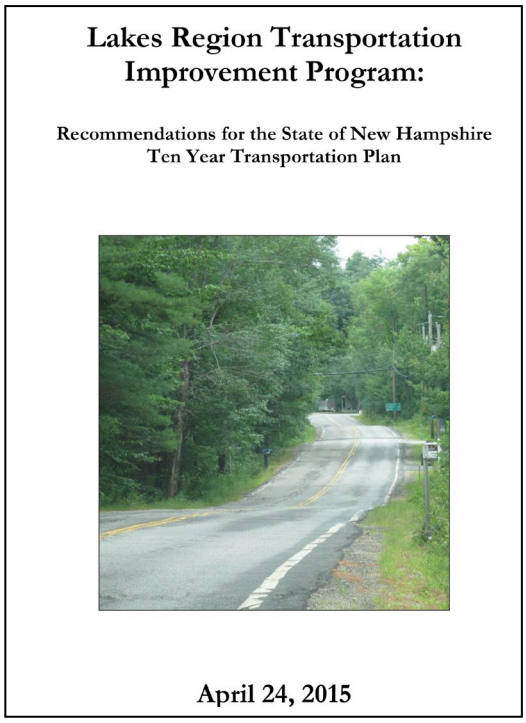
The Appendix A "Project Scoring Criteria and Weight" reveals that Alternative Modes receive 9.2% of the weight for project scoring.

Pedestrian and Bicycle Related Existing Ten-Year Plan Projects Include:

- NH28 – Need for improved pedestrian safety, scheduled for 2024 in Wolfeboro.

Pedestrian and Bicycle Related Priority Projects for Inclusion in the Ten-Year Plan include:

- Rte 11 from Ellacoya State Park in Gilford to Minge Cove in Alton: reconstruction to include striped shoulders for bicycle / pedestrian use.
- NH 25 at Lake Shore Drive in Moultonborough: Address pedestrian safety issues through roadway rehabilitation.
- NH 25 at NH 109 North / Holland Street in Moultonborough: Include pedestrian crossing signal.
- NH 104 in Bristol from School Street east 3,400 feet: provide sidewalks for nursing home, apartments, businesses, etc. Includes intersection improvements at sharp turn.
- NH 25 Central Village in Moultonborough from Blake Road to Old Rte 109: Implement traffic calming measures such as village gateway treatments, crosswalk refuge medians, street trees, narrowed travel way, village design street lighting, on-street parking, and speed limit reduction.



- NH 25 in Moultonborough's Central Village: Construction of Phase 1 of the Town's Sidewalk Plan, includes sidewalks, paths and at least one crosswalk.

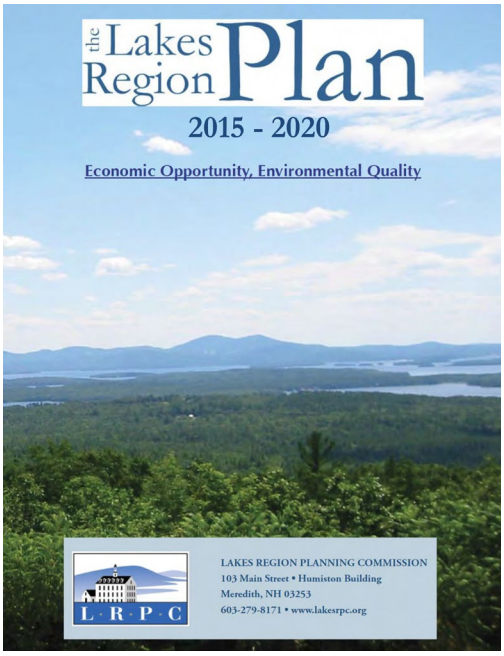
2.1 Lakes Region Plan 2015 – 2020, Economic Opportunity, Environmental Quality

This comprehensive plan includes a Vision for the Lakes Region that contributes to a sense of community and sense of place. The Vision includes many references to maintaining the region's environment and natural resources. Additionally, the Vision's goals include "A balanced transportation system that has good roads, bridges, reliable public transit, mobility options for seniors and special needs, and available bike paths." When the public was asked "What could make this area even better?" The second highest mentioned topic was more public recreation in the form of trails, bike paths, and beaches.

Dependence on the automobile as a sole means of transportation was considered a noteworthy trend in this report. The report cites that lower-income families living in automobile-dominated metropolitan areas, the costs of owning and maintaining an automobile can be as high as 25% of household income. The report mentions that the National Conference of State Legislatures (NCSL) reviewed state policies and statutes that promote walking and biking for physical activity. The five policies that are most likely to increase walking and bicycling include:

- Incorporating sidewalks and bike lanes into community design

- Providing funding for biking and walking in highway projects
- Establishing Safe Routes to Schools
- Fostering traffic calming measures
- Creating incentives for mixed-use development



At a Lakes RPC workshop in 2011 hosted by NHDOT to understand customer satisfaction, 66% of participants were dissatisfied or very dissatisfied with the level of accessibility for alternate modes. In the Local Transportation Planning and Land Use chapter, many projects are highlighted as successes that contribute to the livability and other transportation-related goals of the Lakes Region Plan:

- Belmont and Bristol Downtown Improvements – Both towns have upgraded roadways, parking, parks, and pedestrian accessibility in their downtowns.
- The WOW Trail – The proposed multi-use path in Laconia could extend 9 miles through Laconia from Meredith to the Belmont town line. The WOW Trail is a piece of a larger regional trail from Andover to Meredith with several pieces of the trail currently scheduled for construction.
- Northfield and Moultonborough Safe Routes to School – Both towns worked with the Lakes RPC to identify ways to improve walking and bicycling environment for K-8th grade students. Both plans include recommendations for sidewalk improvements downtown.
- Newfound Lake Pathways – The mission to build a 17-mile pathway around Newfound Lake to encourage walking and bicycling.
- Northern Rail Trail – The inn-to-inn bike tours offers a fun ride for all types of bicyclists that utilize seven historic inns in the Dartmouth-Lake Sunapee region.
- Meredith Planning Board – Working to install a Pedestrian Hybrid Beacon on NH25 in Meredith.

Other takeaways:

- 85% of all NH residents and 83% of Lakes RPC residents surveyed are in favor of "promoting safe places to walk or bike"

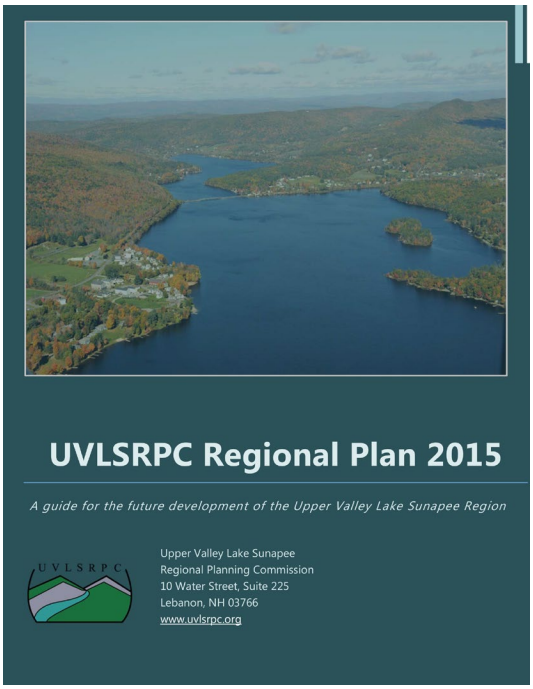
The comments included on the survey revealed that people want bike paths connecting town centers and more and higher quality sidewalks because their current commute feels dangerous.

3. Upper Valley Lakes Region Regional Plan, June 2015

The bicycle and pedestrian transportation in the "Region" chapter begins with the Vision outlined in the introduction of the report: A safe bicycle transportation network connects all the communities in the region and every community center can be accessed by a safe and appropriate pedestrian transportation network.

Crashes

The UVLSRPC has a disproportionately high number of bicycle fatalities. Fatal crashes in Croydon and Newbury have resulted in the development of an advocacy group to raise awareness of NH RSA 265:143-a which requires motor vehicles give a minimum of three feet while passing bicyclists.



The report states that a combination of infrastructure improvements, public education campaigns, and increased law enforcement have contributed to a statewide decline in fatal crashes across New Hampshire. A multi-stakeholder group titled New Hampshire Driving Toward Zero Coalition has a goal to eliminate all highway fatalities in the state, with an initial goal of a 50% reduction by 2030.

A Safety Improvement Needs Map details safety-related projects in the region, including:

- Enfield: Reconfiguration of the US 4 / Maple Street / Main Street intersection.
- Lebanon: Pedestrian safety improvements at the NH 10 / Gould / Oak Ridge Road intersection.
- Newport: Reconfiguration of the intersection of Sunapee Street / Main Street.

Mode Share

- The percentage of commuters who commute to work by bicycle statewide: 0.3% and in the UVLS RPC: 0.4% (Target is 1%).
- The percentage of commuters who commute to work by walking statewide: 3.1% and in the UVLS RPC: 6.1% (Target is 7%).

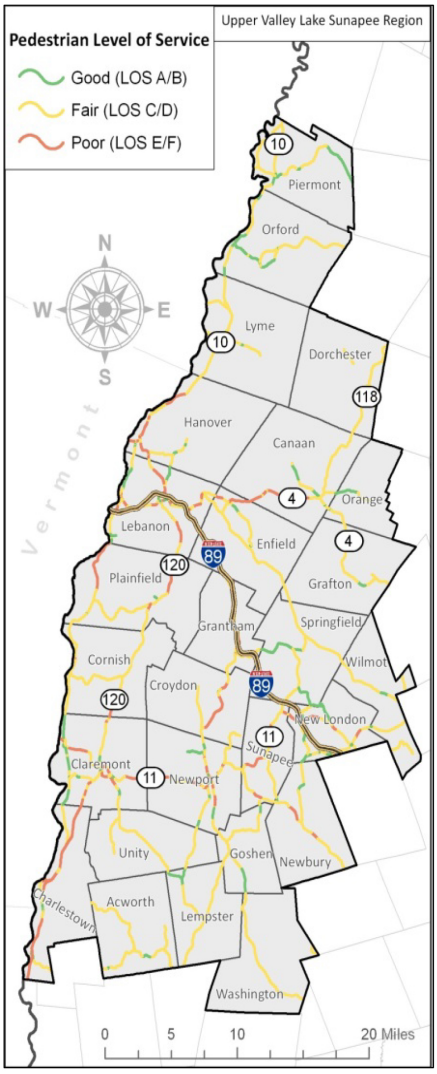
Two maps depicting Bicycle Level of Service (BLOS) analysis and Pedestrian Level of Service (PLOS) analysis for each of the state and urban compact roads in the region follow the mode share portion. The maps show each of the aforementioned roads using colors indicating one of three categories:

- Good Conditions = LOS A/B
- Fair Conditions = LOS C/D
- Poor Conditions = LOS E/F

Bicycle Level of Service is a quantitative measure of a roadway's suitability for bicycle traffic, through the lens of bicyclists' perceived level of safety and comfort. The analysis requires inputs including vehicle speed, proportion of heavy vehicles, pavement condition, lane width, on-street parking, shoulder width, and traffic volume. Pedestrian Level of Service, similar to the explanation above, utilizes traffic volume, shoulder width, on-street parking, sidewalk presence, sidewalk width, and vehicle speed. The goals for the RPC include using Performance Measures to actively score each of the roads in the regions using BLOS and PLOS. The current score in the region for both modes of active transportation is a "D", with the 2030 Target is for the average score to be a "C".

The report includes a map of specific bicycle and pedestrian related improvements. Examples include:

- Claremont: Implement the improvements identified in the Bobby Woodman Rail Trail Action Plan.
- Enfield: Construct sidewalks along US 4 between Main Street and the Canaan Town Line.
- Lebanon: Construct multi-use path on east side of NH 120 between I-89 exit 18 and Hanover town line.
- New London: Complete Elkins Village transportation enhancement projects to improve sidewalks.



The plan includes a Pedestrian Level of Service Analysis map, highlighting the level of comfort along the roadways in the UVLS RPC

Due to the funding issues outlined in the introduction, improving the pedestrian and bicycle network in the UVLSRPC will require strong local funding commitments according to the report. Projects funded through public-private partnerships may have a higher probability of being realized. Two recent examples of public-private partnerships in the region include the Mascoma River Greenway in Lebanon and the new Riverwalk pedestrian bridge in Sunapee. Finally, Planning Boards can utilize the development review process to require that developers build sidewalks and bicycle infrastructure in all new development.

Funding Sources

A New Hampshire statute allows towns to charge $5 on the vehicle registration fee for any transportation need in the community. Approximately 31 towns in the state are utilizing this fee as a

funding source for investment in alternative transportation. For example, Lebanon uses the funds for public transportation while Hanover utilizes the revenue for bicycle and pedestrian facilities.

4. Southwest Connects: Southwest Transportation Plan 2015-2035, January 2015

The Transportation Planning Approach for the Southwest Region includes a variety of goals and objectives, some of which specifically include walking and bicycling:

Goal 3: The transport system will provide people of all ages and abilities timely access to goods, services, recreation, entertainment and companionship.

- Objective D: It will support and encourage local efforts to improve street, sidewalk, bicycle path and virtual connectivity as well as land use practices that reduce overreliance on building transportation capacity or requirements for long-distance transportation solutions

Goal 4: "The transport system will be designed and managed to eliminate fatalities and injuries as well as provide reassurance to the traveling public that they are safe."

- Objective C: It will address "incomplete streets" and its effect on the traveling public's comfort level while walking, biking or using transit.

According to the SWRPC and NHDOT, the region currently features:

- 103 miles of sidewalks
- 45 miles of hardpack or paved multiuse paths
- 193 miles of 4' shoulders suitable for bicyclists
- 1 mile of bike lanes
- 36 miles of abandoned rail ROW
- Rail trails include:
    - Ashuelot Rail Trail
    - Fort Hill Branch Rail Trail + Fort Hill Recreation Trail
    - Cheshire Rail Trail
    - Manchester / Keene Branch Rail Trail
    - Jaffrey-Rindge Trail
    - Mason-Railroad Trail
    - Greenville Rail Trail
    - Peterborough's Common Path
    - Hillsborough-Bennington Trail
    - Monadnock Branch Rail Trail

The plan breaks each of the region's major transportation corridors into Corridor Profile Summaries -- sections of the report that summarize existing conditions, highlight issues, as well as discuss demographic characteristics like jobs and housing trends. The following list summarizes challenges related to bicycle and pedestrian access and safety on primary corridors:

- Keene's Multi-use path is currently broken up by parking lot development in the vicinity of Colony Mill (NH 9 West Corridor).
- Coordination required between Keene and NHDOT to find funds to provide a safer north-south crossing for Ashuelot Branch Rail Trail that parallel's NH 10 south (NH 10 South Corridor).
- Downtown Winchester making efforts to expand sidewalk system for numerous walkers, challenges of ongoing maintenance and new sidewalk construction (NH 10 South Corridor).
- There is a segment of the Cheshire Rail Trail that is impassable due to neglected maintenance (NH 12 North Corridor).
- Safety improvements are needed at NH 101 where pedestrians cross from Marlboro Street to access the Ashuelot Branch Rail Trail (NH 12 South Corridor).
- There are administrative challenges maintaining the Cheshire Rail Trail near downtown Troy where there are sandpits, illegal dumping, and broken glass (NH East 101 Corridor).
- Coordination is required between Keene, Keene State College and NHDOT to perform maintenance of bicycle and pedestrian bridge underpass on NH 12 at Keene State College (NH East 101 Corridor).
- Peterborough is in need of a safe pedestrian crossing over US 202 for middle schoolers at South Meadow School (NH202 North Corridor).
- Peterborough Common Path is disconnected with rail trail continues in Jaffrey and Rindge. Coordination between towns would be beneficial (NH 202 South Corridor).

State policies and funding levels have profoundly shaped the transportation system, and affect bicycle and pedestrian facilities. The SWRPC report states that "state funding for walking, bicycling, and rail does not exist and these are traditionally paid for with federal and local funding." (pg. 27)

The report lays out the ways that municipalities can improve walking, biking, and transit conditions in their community:

- Planning boards set land use and transportation goals and objectives, and integrate them into Master Plans, which can prioritize walking and bicycling facility projects.
- Zoning, site plan, and subdivision regulations can require new developments or existing infrastructure upgrades to implement walking and bicycling facilities.
- A municipality's governing body can use its Capital Improvement Program to improve walking and bicycling facilities.
- More communities are officially adopting Complete Streets policies that require pedestrians and bicyclists are planned and designed for in all new infrastructure projects and roadway changes or upgrades.
- The NH RSA 261:153 VI is a $5.00 vehicle registration fee that provides funding specifically for alternative modes of transportation.

5. Central New Hampshire RPC: Transportation Improvement Program, FY 2019-2028, April 2017

The FY 2019-2028 Transportation Improvement Program (TIP) consists of a list of transportation projects for the Central New Hampshire RPC (CNHRPC) region that are consistent with the goals and vision

established in the comprehensive Regional Transportation Plan, adopted in April, 2015. The TIP was adopted by the CNHRPC Full Commission on April 13, 2017.

The importance of properly incorporating pedestrian and bicycle infrastructure in the design of all transportation infrastructure improvements is clearly stated in the report. Additionally, "there is also a great need for new and improved standalone bicycle and pedestrian infrastructure." Four specific projects that were not funded from NHDOT's 2016 Transportation Alternatives Program are highlighted:

2016 TAP Un-funded Projects			
Town/City	**Location/Project Name**	**Regional Rank**	**State Rank**
Concord	Merrimack Greenway Multi Use Path	1	15
Bradford	West Main St Sidewalks	2	14
Pembroke	US 3 Sidewalks and Multi Use Path	5	40
Henniker	Western Ave Sidewalks	5	40

Pedestrian/Bike Related Regionally Significant Projects:

- Center turn lane, improved pedestrian / bicycle facilities: US 4 King Street, Boscawen. $1.4m.
- Improved pedestrian / bicycle facilities / Complete Streets: NH 103/Main Street, Warner. $0.91m.

Pedestrian/Bike Related Regional State Highway System Projects:

- Merrimack River Greenway Trail: Concord. Connects to the eventual terminus of the "Northern Rail Trail" at the Boscawen Town Line to the proposed "Salem to Concord Bikeway" at the Pembroke Town Line. Roughly 15 miles long. $15m.

Pedestrian/Bike Related City of Concord Urban Compact Projects:

- Broadway Street/West Street Intersection: Improved pedestrian access and crosswalks, Concord. $1.13m.

Pedestrian/Bike Related Ten Year Plan Projects (Considered Funded):

- NH28 and Main Street Intersection Improvements: Includes pedestrian signals. Town of Chichester. $1.68m.
- NH106 and South Village Road Intersection Improvements: Includes sidewalks and pedestrian crossings, Town of Loudon. $1.4m.

Urban Compact Highway System Project:

- US Rt. 3 Corridor Improvements: Includes defined shoulders and curbed sidewalks, Concord. $7.87m.

5.1 Central New Hampshire RPC and Southern New Hampshire Planning Commission: Regional Trails Plan, 2012 , Salem – Manchester – Concord (Adopted January 10, 2013)

This plan creates a vision for a regional trail network that offers non-motorized transportation and recreation opportunities and connects communities and open spaces between Salem and Concord. It was created jointly by the Southern NH Planning Commission (SNHPC) and the Central NH Regional Planning Commission (CNHRPC) under the guidance of the Regional Trails Coordinating Council (RTCC).

The plan identifies both individual trail projects as well as a needs assessment to help local groups develop their trails plan into a regional network.

The RTCC is made up of at least a dozen trail groups, agencies, non-profits, and folks who attend in RTCC meetings as well as others who share the goal of developing a regional trail network between Salem and Concord. Bringing local stakeholders, government agencies, non-profit groups, and private businesses together enables the RTCC to develop consensus on priorities of trail location and development.

The plan includes maps of the general study area, existing trails, and planned trails. The planned trail system maps show a clear north-south trail alignment that would become the "back bone" of the regional trail system. This alignment was envisioned in the 2003 Salem to Concord Bikeway Study. This proposed trail alignment, titled the "Granite State Rail Trail" will connect to existing trails in Methuen, MA as well as to the planned extension of the Northern Rail Trail – ultimately creating a connection from Lebanon to the NH/Mass. line in Salem, NH. Several east-west spurs will connect the trails to communities adjacent to the back bone.

Challenges to Implementation

Salem – Manchester: A gap in the abandoned Manchester and Lawrence (M&L) railroad corridor exists at the Manchester-Boston Regional Airport due to a runway that now extends across the former M&L alignment

Manchester – Concord: Administrative barriers have prevented the development of a rail-with-trail alongside an active rail corridor downtown Manchester to Hooksett District Court building.

Concord Northward: The absence of an abandoned rail corridor represents the primary challenge to implementation from Concord to the existing Northern Rail Trail in Boscawen.

East-West Spurs: The existing 40-mile-long Rockingham Trail currently ends in the outskirts of Manchester and does not link to other trails or Downtown Manchester.

Bridges: There are a number of locations where a bridge would be required to cross a busy road or a river. Several potential bridge locations include:

- Over the Piscataquog River to connect the Piscataquog Trail to the Goffstown Rail Trail
- In Manchester at Queen City Avenue
- In Londonderry at Mammoth Road and Rockingham Road
- In Salem at Rockingham Park Boulevard
- Crossing the Suncook, Soucook, and Merrimack Rivers

Catalyst Project Locations

The RTCC identified locations for potential new trails along abandoned railroad corridors or other routes with high potential for trail connectivity. These project locations are located in areas either without local trail groups moving the project forward, or where the existing local trail groups are more engaged on other projects:

- "A riverfront trail along the Merrimack River in Bedford, which could be continued south for a connection to Nashua. A trail here could have exceptional recreation and transportation value, and would be anchored by two large population centers.
- A trail along an abandoned railroad corridor from Suncook Village through Pittsfield and Barnstead, which once was the route for the "Blueberry Express" train.
- Development of a trail along the abandoned Portsmouth and Concord Railroad in Candia and Hooksett.
- Extension of the Goffstown Rail Trail on the abandoned corridor to connect to the developing New Boston Rail Trail.
- Development of the former Concord and Claremont Railroad through Hopkinton to Warner and beyond, or from Henniker and Hillsborough to the existing multi-use trail in Hillsborough and Deering.
- Further improvements to the Rockingham Recreational Trail east into Derry and beyond and west into Windham and beyond." (pg. 13)

The plan includes a detailed table that identifies needs, including whether ROW changes are required, or if there are identified external funding sources. The plan further discusses trail funding sources, maintenance and user counts, and the enforcement of the use of all-terrain vehicles (ATV) on trails. In the section on funding sources, a noteworthy example of a non-federal funding source is the Windham Rail Trail, which "was begun by the developer of an adjacent housing development who recognize the value of a trail to his development." (pg. 17.)

The remainder of the Regional Trails Plan 2012 includes maps that show trails within each community and a table that includes trail characteristics as well as information about the local trails group, contact information, and upcoming trail projects.

6. Southern New Hampshire Planning Commission, FY 2017 – FY 2040, Regional Transportation Plan, January 2017

Chapter 2.7, titled Regional Goals for Alternative Modes of Transportation, lists the following five goals:

1. "To encourage the use of alternative modes of transportation such as walking and cycling through participation in a planning process that supports the development of a multi-modal transportation system for the region."
2. "To facilitate the use of alternative modes of transportation and promote livable and sustainable communities by pursuing regional opportunities to plan for higher density mixed-use developments in town centers and other appropriate locations."
3. "To ensure that pedestrian and bicycle transportation components are properly incorporated into the design of transportation infrastructure improvements."
4. "To support investment in and assist member communities in pursuing funding for projects involving alternative modes of transportation improvements."
5. "To encourage communities to adopt a Complete Streets policy, to routinely design and operate the entire right of way to enable safe access for all users, regardless of age, ability, or mode of transportation."

The SNHPC has participated in various Safe Routes to Schools projects in member communities as well as demonstration projects. The SNHPC is also participating in the Regional Trails Coordinating Council (RTTC) with NHDOT and CNHRPC, among other stakeholder groups. Formed in 2010, the RTTC is tasked with assisting member organizations to develop a comprehensive trail plan (trail plan formally adopted January, 2013). The RTCC provides a forum for collaboration to connect existing and planned trail networks across municipal lines, and follows their adopted Strategic Plan, which is to:

1. Provide data and maps on existing trails;
2. Identify and map a planned regional trail network;
3. Catalog existing trails and active trail groups in the region;
4. Roughly outline funding opportunities for trails;
5. Recommend strategies for marketing trails and conducting outreach;
6. Recommend methods for continued coordination between trail groups;
7. Provide various recommendations to assist in implementation of the plan and the development of the regional trail network; and
8. Describe the RTCC's origin, purpose, vision, mission, and goals.

Portions of the regional trails system remain incomplete. The RTCC identifies and pursues sources of funding, developing fundraising platforms, bike tours, and prioritizing trail sections to be completed. The SNHPC appears dedicated to the promotion of pedestrian and bicycle infrastructure, and generally furthers those goals by supporting the following objectives:

- Establishing a continuous and coordinated regional bikeway and pedestrian walkway system, ensuring that this regional system is well linked with local municipal systems and adjacent systems in adjacent towns and regions;
- Making biking and walking safer;
- Creating a traveling environment that provides an inviting, viable alternative to motorized travel;
- Promoting public awareness and acceptance of bicycling and walking as attractive, viable transportation and recreation modes;
- Participating in and promoting SRTS activities in the SNHPC region; and
- Fully and meaningfully integrating bicycling and pedestrian needs into the land use planning, transportation planning, highway design, and highway maintenance process.

The report notes that existing land use patterns often create obstacles to implementing safer and comfortable pedestrian and bicycle facilities. The ability for individual municipalities to plan for safer and comfortable pedestrian and bicycle facilities varies widely across member communities. SNHPC proposes the following changes to policies and regulations pertaining to pedestrian and bicycle facilities:

- **Land Use** by making development more compact and reducing distances between origin and destination points;
- **Engineering** practice by suppling adequate facilities and seriously considering bicycle and pedestrian needs at every stage of the planning and development process;
- **Education** concerning automobile, pedestrian and bicycle safety;
- **Encouragement** by building community support and awareness, and by assisting private and public sector businesses to increase employee levels of biking and walking; and,
- **Enforcement** by more strictly implementing existing laws to strengthen the education element.

The report ends with the Fiscally Constrained Projects List:

- Manchester – 29811 – South Manchester Rail Trail – Construct multi-use path along the abandoned rail corridor from Gold St to Perimeter Rd. FY 2017 cost: $1.42m (From the SNHPC TIP FY 2017-2020)
- Multiple Muni's – 12881 – Transportation Alternatives Program - $19.15 million (From the SNHPC Regional Transportation Plan FY 2021-2026)
- Deerfield – NH107 - $0.65 million. Bicycle Lane. FY 2031. (From the SNHPC Regional Transportation Plan FY 2027-2040)
- Derry – Bike Path / Trail - $0.75 million. Extend to Londonderry Town Line along B & M Rail corridor. (From the SNHPC Regional Transportation Plan FY 2027-2040)

7. Nashua RPC, Metropolitan Transportation Plan, 2015 – 2040, Adopted December 2014

The Transportation Technical Advisory Committee (TAC) Vision to guide the development of the Nashua Region Metropolitan Transportation Plan (MTP):

This document provides a basic blueprint for long-term transportation investment in the Nashua Region to the horizon year 2040.The plan is structured around four major goals, developed through public outreach and coordination with advisory committees, which include Mobility and Accessibility, Quality of Life, System Sustainability and Implementation.

"The Nashua Region has a comprehensive and reliable multi-modal transportation system that enables universal access for all travelers, including disabled, youth, and seniors, to all points within and beyond the region. Our transportation system enables a highly mobile community and promotes economic growth, public health, and enhances the natural environment. The Transportation system is adaptable to changes in demographics, economic conditions and energy related forces. Sufficient funding supports the operations, maintenance and expansion of our transportation infrastructure to continuously meet the needs of the region."

The Bicycle and Pedestrian Facilities chapter highlights the existing conditions of the bike and sidewalk network in the Nashua RPC. 2% of residents of the region walk or bike on their commute trips. Across the region, 28% of residents and 27% of jobs are located within a half mile of downtowns or town centers. Municipal efforts to improve bicycle and sidewalk infrastructure have included:

- Nashua – expanded the Riverwalk along the Nashua River near downtown
- Brookline – Expanded sidewalk facilities in its village center
- Pelham Village – Two roundabouts will improve pedestrian comfort
- Amherst – Plans are in development to improve pedestrian conditions in the area surrounding local schools and the village center
- Merrimack – Recently completed a sidewalk and trail plan for the center of town
- Milford – Town-wide bicycle and pedestrian master plan in development

Overall, sidewalk networks are best developed throughout Nashua and in the town centers of Milford, Hudson, and Wilton. The Town of Merrimack has over 20 miles of sidewalks, but they are not well connected and primarily serve residential neighborhoods. Adjacent to the Sagamore Bridge is the only dedicated bicycle / pedestrian crossing of the Merrimack River in the region.

Many residents made it clear that the majority of roads in the region do not offer comfortable pedestrian or bicycle facilities. Further, they indicated a strong desire for investments in pedestrian and bicycle infrastructure and amenities, particularly along the 101A corridor due to the proximity to retail, residential areas, and jobs. While striped shoulders provide a basic level of bicycle accommodation, there are few intersections with crosswalks and no sidewalks. The corridor remains unattractive for walking and bicycling.

The 2014 plan references a specific goal from the 2005 plan to "Increase awareness of biking and walking as a viable means of transportation." The 2005 plan recommended the establishment of a bicycle / pedestrian Technical Advisory Committee to ensure implementation of proposed facilities.

Crashes

Between 2003 and 2013, the majority of motor vehicle crashes involving pedestrians and bicyclists occurred in and around Nashua and Hudson's town center. Other high crash locations include Daniel Webster Highway in Merrimack, East Milford, and the eastern terminus of the Hudson Circumferential Highway.

7.1 Nashua RPC, The Nashua Region: A Story Worth Telling

Residents consistently said Downtown Nashua and the Milford Oval area are models for vibrant, mixed-use and walkable neighborhoods. The Oval serves as a local business hub and is home to many restaurants and other retail shops and offices. However, the region lacks an integrated pedestrian and bicycle network across communities.

During the plan's public outreach process, residents consistently advocated for greater investment in alternative transportation modes. The expansion of walking and bicycling options and the introduction of rail service connections was strongly advocated.

8. Rockingham Planning Commission, 2040 Long Range Transportation Plan, Adopted October 2017

The Rockingham LRTP includes an existing conditions chapter that summarizes land use patterns, demographic and commute level data, and information on highways, local roads, public transit, freight facilities, and bicycle and pedestrian facilities. Between 2000 and 2015, both Portsmouth and Exeter saw modest increases in the percent of people who commute by bicycle or walked to work. Additionally, between 2003 and 2015, there was a reduction in the number of crashes that resulted in injury to a pedestrian or bicyclist.

A key policy of the RPC is to improve the safety and convenience of non-motorized transportation and reduce the number of vehicle miles traveled. Additionally, the report acknowledges the needed investment in not just pedestrian / bicycle infrastructure but programs and enforcement as well.

An inventory of paved off-road paths includes:

- The Southern NH Rail Trail being developed between Salem and Concord
- The recently completed Pease Multi-Use Path at the south entrance to the Pease Trade Port
- A path connecting Fox Point Road in Newington to the Trade Port
- A side path in Odiorne State Park

Planning is underway for:

- The New Hampshire segment of the East Coast Greenway

- "The State plans to purchase a 9.7-mile segment of the Hampton Branch rail corridor between Hampton and Portsmouth for use as a rail trail. The State already owns the southern 4.5 miles of the corridor between Hampton and the MA border, on which the Town of Seabrook is actively pursuing rail trail development."

The RPC has secured funding for and completed shoulder widening projects that helped to create:

- The Great Bay Bicycle Loop
- The Exeter-Hampton-North Hampton Bicycle Loop
- New Hampshire Coastal Byway

Success of these and other projects can depend on the level of involvement and match funding by the municipality. NHDOT has a formal policy to add shoulder width for *de facto* bicycle routes when state highways are repaved, and District 6 has narrowed some travel lanes from 12 feet to 10 - 11 feet to gain shoulder width as well.

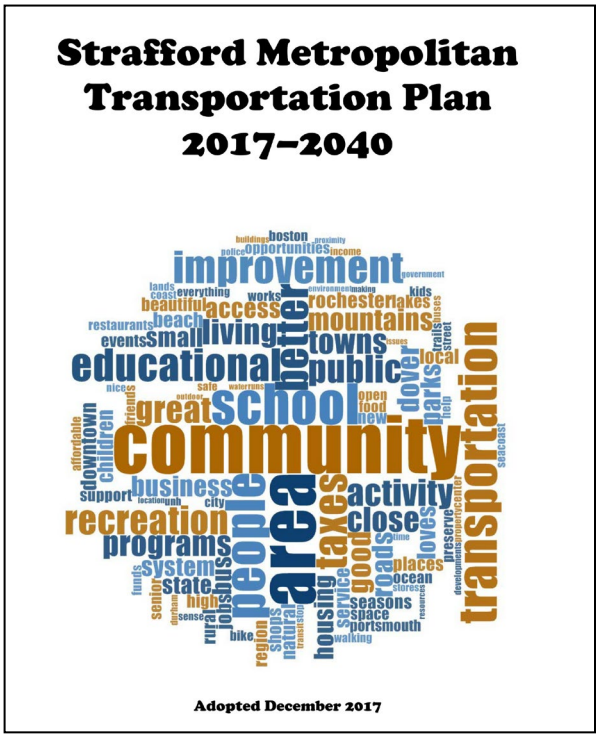
The report highlights the support facilities to encourage bicycling, such as shower facilities, secure indoor bike parking, secure bike parking at bus stops and transit stations, along with bike racks on the front of buses.

9. Strafford Metropolitan Transportation Plan 2017 – 2040, December 2017

The report notes that improvement and expansion projects like ones along NH 108 and NH 16 are not a sustainable, long-term solution where a growing population is comprised mostly of drivers who commute by car, alone. Long term solutions need to look beyond of capacity and remove vehicles from the road. This can include designs for public transportation, safer and attractive bicycle and pedestrian infrastructure, and promotion of other choices other than personal automobiles.

The Strafford report discusses the high percentage of young residents in the region compared to the rest of the state, and the interest desires of Millennials in alternative transportation modes. More than 40% of Millennials report that alternatives to private automobile are "very important" or "extremely important" to them. A third of Millennials reported that they prefer their primary mode of transportation to be transit, carpool, car share, bike share, bicycling, or walking.

Bike Infrastructure



In 2006, NHDOT identified a statewide network of bike routes including 330 miles in the Strafford region. At that time, fewer than 10 of those miles had painted bike lanes or shared lane markings. The number of people bicycling for recreation, exercise, or commuting has grown steadily in the region. These encouraging trends require continued investments in safer bicycling infrastructure throughout the region.

The RPC received Strava data from NHDOT that covers the year between Nov 1, 2013 – Oct 31, 2014, allowing them to reach many conclusions regarding bicyclist counts, streets and roads frequented by bicyclists, such as:

- Approximately 3,300 registered users of the app live in Strafford, Carroll, and Rockingham counties
- Bicyclists rode 355 days of the year, took 24,882 rides in the Strafford region, and traveled on 73% of the road miles in the region
- An algorithm in the software flagged 5,569 rides, or 22%, as commute trips

The report states that many of the designated bicycle routes in the area do not provide adequate bicycle facilities from home to destination. Therefore, bicyclists are traveling on roads where they are mixed with motor vehicle traffic. Projects are in development to improve conditions for bicyclists on NH 108:

- Shoulder widening from Newmarket/Newfields town line to Mill Pond Road in Durham
- Dover-Rochester-Somersworth Complete Streets Project from Weeks Crossing in Dover to Innovation Drive in Rochester will include bike infrastructure.

Strafford RPC Transportation Projects to be Submitted for Inclusion in the 2017-2026 TIP

- Dover – Improvements to sidewalks, street crossings, and other facilities needed to connect pedestrians from Amtrak station to downtown. Chestnut Street bridge over the Cocheco River – Potential road diet may include bike lanes or shared bus rapid transit lane
- Farmington – NH 75, 153 downtown corridor: Upgrade sidewalks to improve mobility and accessibility. High School to North Main Street: Install safer walking and bicycling facilities from downtown to Farmington schools
- Newmarket – NH 108 at NH 125: Increase shoulder width on bridge to facilitate alternate modes. Grant Road over the Piscassic River: Increase shoulder width to provide safer conditions for pedestrians and bicyclists
- Rochester – NH 125 at Charles Street: Intersection realignments to improve safety for bike and pedestrian facilities. Rochester: Between Strafford Square roundabout and N. Main Bridge:

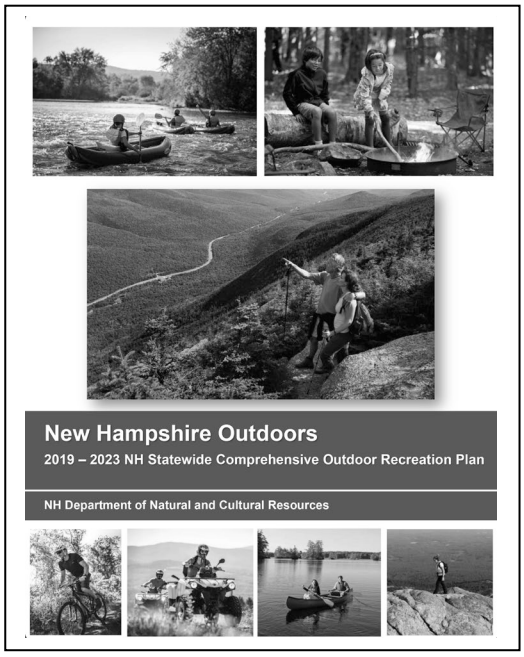
Intersection and streetscape improvements to realign intersections and improve safety for bicyclists and pedestrians. US 202, east of NH 16: Sidewalk upgrades, streetscaping, bike lanes, and traffic calming to improve livability. Salmon Falls Road: Build sidewalks in residential areas, roadway improvements include bike lanes. Rochester: Old Dover Road, between 125 and Tebbetts Road: Widen shoulders and strip pedestrian lane / bike lane.

- Somersworth – Blackwater Rd between NH 108 and NH 9 – Improve safety, upgrade pedestrian infrastructure. Blackwater Rd and NH 9: Potential roundabout. Realign intersection and improve safety by adding facilities for pedestrians and bicyclists.

10. Statewide Planning Reports

10.1 New Hampshire Outdoors 2019 – 2023 Statewide Comprehensive Outdoors Recreation Plan (SCORP), NH Department of Natural and Cultural Resources

Outdoor Recreation Trends



In 2017, the Outdoor Foundation (OF) released its "Outdoor Recreation Participation Report." The report notes a decline in participation by youth in outdoor activities, however economic changes and shifting demographics contributed to the following findings:

- Activities with the highest percentage of first-time participants in 2015 included traditional (on-road) road triathlons as well as off road triathlons, among other sports
- Among youth ages 6 to 17, bicycling is the most popular outdoor activity

The popularity of mountain biking has grown quickly in recent years in New Hampshire and throughout the country. The Outdoor Foundation's 2017 Participation Repot listed road, mountain, and BMX biking as the second most popular outdoor activity for those 6 and above. Data analyzed in Vermont indicated that just four trail networks in that state generated nearly $30 million in economic impact from out-of-state visitors.

Many mountain biking trails exist throughout New Hampshire, including Highland Park, Parker Mountain, and Stratham Hill Park. Keeping tabs on the growth of these locations will help determine the likely economic contributions by a growing number of mountain bike visitors to the state in the future.

Expressed Demand for Outdoor Recreation in New Hampshire

Municipal officials in New Hampshire identified developed recreation facilities as areas of need within their communities. The 14 categories appear in order of the highest percent of a given facility that is "unavailable & inadequate." The number one Outdoor Recreation Facility with the highest percentage

Unavailable and Inadequate is "bike lanes / paths" at 65% unavailable. The fourth highest is "multi-purpose (non-motorized) trails" at 46% unavailable.

Municipal officials identified numerous priorities to help steer funding towards outdoor recreation projects. 60% of survey responders agreed that "Build pedestrian and cycling paths between places of work, parks, schools, and shopping areas" was important. 23% of responders were neutral, and 17% thought pedestrian and bicycling paths were unimportant.

Survey respondents were asked to rank Management Priorities for recreation service delivery in NH. 48% of respondents ranked "improving connectivity of community through pedestrian/bicycle linkages" as Medium or High Priority, while 52% of respondents ranked that category as No or Low Priority.

In summary, this report provides statistical evidence to help push municipal officials to steer funding towards pedestrian / bike projects to provide links to outdoor recreation opportunities (as well as serve as recreational outdoor opportunities in themselves.)

Priorities, Goals, Conclusion: Implementing the SCORP

Goal 3.3: Engage in dialogues with healthcare organizations and residents to further explore and explain the economic health benefits of an active community. The NH Dept. of Health and Human Services Obesity Prevention Program (OPP) receives funding from the national CDC that focuses on target areas for obesity prevention, including:

- Creating safe communities that support physical activity
- Improving access to outdoor recreational facilities
- Enhancing infrastructure that supports bicycling and walking
- Enhancing personal safety and traffic safety in areas where people are or could be physically active

This potential funding source should be investigated for getting more bicycle and pedestrian projects funded.

10.2 Granite State Future, The Statewide Snapshot, June 2015

This report is an integrated review of local and regional planning priorities across New Hampshire. The Statewide Snapshot highlights the input gathered from residents through discussions, online surveys, and paper submission. Residents from across the state shared their vision for the future of the state.

A few trends were apparent throughout the Statewide Snapshot, including:

- With limited transportation choices and concerns about the need for more funding to maintain infrastructure, New Hampshire residents expressed interest in expanded public transit networks and more walkable and bikeable communities. Survey respondents overwhelming support investment in bicycle infrastructure: 85% of respondents supported "promoting safe places to walk or bike."

- Currently, 11.6% of residents commute to work via walk, bike, transit, or means other than single occupancy vehicle. Successful implementation of the identified opportunities within the report should increase that figure.
- State residents expressed a desire for a variety of housing choices in walkable neighborhoods. New Hampshire's existing housing supply (primarily large-lot, single family homes) is poorly aligned with projected demand of future consumer preferences based on changing demographics. Although compact homes and housing in highly walkable areas is increasingly popular, certain regulations either discourage or prohibit those options. The adoption of a more flexible regulations will help individual municipalities plan future land use in response to market needs.

- Encourage NHDOT to utilize multimodal traffic calming strategies while incorporating transit, pedestrian, and bicycle facilities in concert with reviewing land uses that create new traffic demand. This could tie in with the project scoping and driveway (curb cut) permitting process to plan for safe and attractive pedestrian and bicycle facilities on all new and reconstructed roadway projects.
- In order to foster more transportation choices, local municipalities should explore the following potential strategies:
    - Adopt a Complete Streets policy to ensure that roadway projects serve all transportation modes
    - Require streets, sidewalks, and walkways to connect to adjacent properties, including properties not yet developed
    - Require sidewalks on both sides of the street in new developments
    - Require bicycle parking facilities within 50 feet of primary and well-used entrances for all office, multi family, and freestanding commercial uses in appropriate zones.
    - Define appropriate zones where new subdivision roads would be accommodated with sidewalks and crosswalks where appropriate
    - In rural areas where sidewalks are not required, ensure adequate right-of-way widths to accommodate future sidewalks as needed
    - Require new subdivision developments that have sidewalks to connect with existing sidewalk facilities
    - Within new subdivision projects require road design and driveway locations that minimize the number of conflict points and hazards between automobiles and bicycles/pedestrians.
    - Ensure pedestrian walkways are clearly visible and delineated to assure the selection of effective walking routes to and within a site.
    - Ensure pedestrian facilities are designed for ease of maintenance

- Require appropriate amenities (e.g. landscaping, trees, benches) to enhance the walking experience
- Require street lighting and clear sightlines to maximize pedestrian safety.

10.3 NH State Development Plan, New Hampshire in The New Economy: A Vision for Expanded Prosperity, 2000

This report serves as the state's overall planning document and acts as a guide for state agencies as they establish priorities to help allocated limited funding. The plan helps by accounting for the plans of local and regional government bodies and also reflects the vision of the state's citizens. It also highlights the importance or interconnected, intermodal transportation, specifically mentioning bicycle and pedestrian modes of travel.

Chapter 7, titled Investing in Essential Infrastructure, includes a recommendation that the state "expand the availability of intermodal access points such as Park-and-Rides that connect to rail and/or bus systems or other public transit and incorporate bike paths and pedestrian walkways." (pg. 41)

The remainder of the report focuses on strengthening the economy with targeted investments in the workforce, traditional motor vehicle-focused infrastructure, telecommunications, and managing the state's population growth.

10.4 Your Guide to Promoting Walking & Bicycling Accommodations in New Hampshire

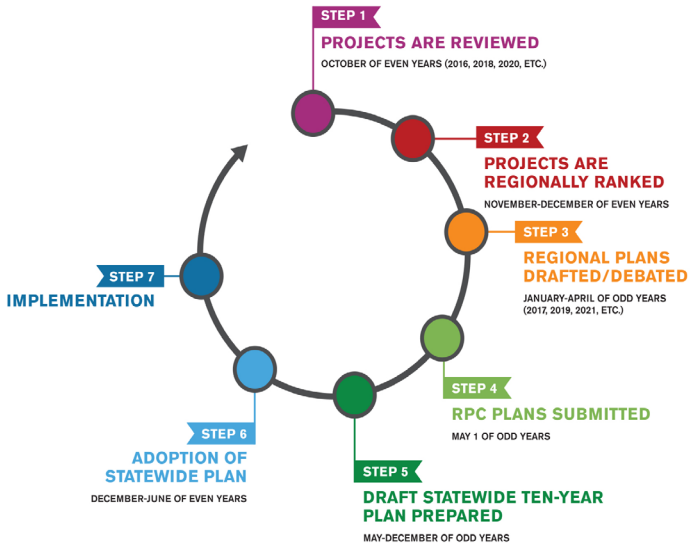
The New Hampshire Pedestrian and Bicycle Stakeholder Guide was developed on behalf of the New Hampshire Department of Transportation (NHDOT) and its Bicycle & Pedestrian Transportation Advisory Committee (BPTAC). The guide informs bicycle and pedestrian stakeholders on how to collaborate with transportation agencies to increase the profile of bicyclist and pedestrian transportation accommodations during the planning and design process for all transportation projects. The guide provides general best practices along with New Hampshire-specific information about transportation planning and funding. The document also includes a design guide focused on interventions for different contexts. The tone prioritizes accessible design and language for this public-facing document.

The plan includes helpful information on how the public can influence existing transportation plans and projects resulting in long-term changes. The plan includes specific steps involved in effectively promoting active transportation:

- Understanding the technical aspects
    - Funding processes, the differences between Capital Improvement Program projects and maintenance projects such as resurfacing program projects

- Understanding governmental processes
- Ability to engage the people with the potential to influence project designs and funding
    - Public Officials, Engineers & Planners, Local Businesses
- The various levels of representation for garnering interest in active transportation accommodations
    - Local Efforts: Towns and cities are in charge of constructing and maintaining their local roads and state numbered highways within Urban Compacts. Some key players may include The Town Manager, Select Board, or City Council, Planning Department, and Department of Public Works.
    - Regional Efforts: New Hampshire's nine Regional Planning Commissions (RPC's), four of which serve as federally required Metropolitan Planning Organizations (MPO's). RPCs support transportation projects within and through their regions by collecting data and reviewing allocation of state funds. Each RPC also has a Transportation Advisory Committee (TAC), with a representative from each municipality serving on the TAC to ensure equal distribution of projects across the region.
    - State-level Efforts: To have a potential project move forward that would require some state or federal funding, it must be added to the state's Ten Year Plan. The Ten Year Plan lists approved transportation projects, their costs, and funding sources. To have a project included in the plan, it must go through the seven steps shown in the adjacent graphic.

The remainder of the plan includes a Design Guide that provides a firm understanding of minimum widths, additional resources, vocabulary, and illustrated examples of a variety of conventional and innovative active transportation infrastructure options.

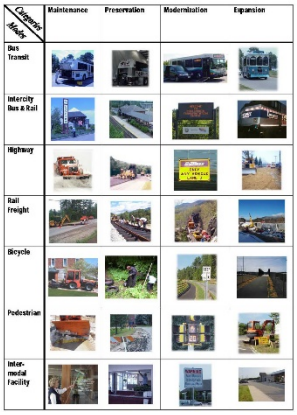


Ten years' worth of projects and their funding sources are identified during a two-year process.

10.5 NH Long Range Transportation Plan, July 2010

The NH Long Range Transportation Plan outlines the strategic vision for the New Hampshire Department of Transportation and the State for a 20-year timeline. The document "articulates a future vision for the State in which transportation will play an active role" to preserve New Hampshire's unique character, quality of life, enhance the quality of the natural environment, and promote economic development and land use. The Plan's recommendations are supported by the four Strategic Outcomes that were the result of the Community Advisory Committee and public outreach process from Spring 2006. The four strategic outcomes are:

1. Unify transportation planning and investment with broader state goals and actions
2. Integrate planning and investment decision-making across all transportation modes, facilities, and services
3. Increase investment in the areas of transportation infrastructure preservation and maintenance, travel demand management, and travel choices
4. Establish new, more cost-effective collaborative partnerships to better leverage resources and to achieve long term goals



The New Hampshire Transportation Vision specifically mentions bike and pedestrian connections:

"Transportation in New Hampshire is provided by an accessible, multimodal system connecting rural and urban communities. Expanded transit and rail services, a well-maintained highway network and airport system provide mobility that promotes smart growth and sustainable economic development, while reducing transportation impacts on New Hampshire's environmental, cultural, and social resources. **Safe bikeways, sidewalks, and trails link neighborhoods, parks, schools, and downtowns.** Creative and stable revenue streams fund and organization that uses its diverse human and financial resources efficiently and effectively" (pg. 4).

The recommended strategy includes "actions, policies, programs, and investments specifically tailored to work in a coordinated fashion toward achievement of the plan's Vision and Goals." The strategy encompasses the realities of "travel needs and trends of today and recommends a shift in investments to better position the state to remain economically competitive and meet multiple challenges" (pg. 5). The strategy includes:

- "Place renewed emphasis on the preservation of existing transportation infrastructure over added capacity
- Create new opportunities for travel choices in tandem with transit and pedestrian-supportive land uses and travel demand management"

Key initiatives include reducing fatalities and serious injury, keeping existing transportation infrastructure in good operating condition before building additional capacity, and developing decisions based on rigorous discussion of problems, values, and priorities with stakeholders in the community.

In the Important System Issues portion of the plan, the lack of facilities to accommodate bicyclists and/or pedestrians is mentioned, followed by a lack of 'Complete Streets'.

In the Bicycle and Pedestrian Systems chapter, the plan indicates that:

- There are numerous Regional and Local On-Road Bicycle Routes or Networks along ~4,000 miles of roadway
- "The State owns 23 abandoned / inactive rail corridors totaling approximately 315 miles with many suitable for walking and hiking, but not bicycling due to unimproved surfaces"

Important Systems Issues include:

- "More effective integration of bicycle and pedestrian facilities is needed with the planning, design and construction of roadways through context sensitive solutions to create Complete Streets
- Local street networks with a high degree of connectivity are needed to provide low traffic volume bicyclist and pedestrian route alternatives from busier arterial and collector roads
- The level of bicycling and walking is dependent on land development patterns at sufficient density, proximity to destinations, a mixture of land uses, and the availability of safe, convenient and attractive facilities"

Livability

NHDOT recognizes that livability is a new topic of focus for understanding strategic transportation investments. The FHWA defines livability as "efforts that tie the quality and location of transportation facilities to broader opportunities such as access to well-paying jobs, affordable housing, quality schools and safe streets" (pg. 31). NHDOT is supporting the concept of livability by utilizing Context Sensitive Solutions (CSS) process for the design of transportation projects by engaging stakeholders and building consensus around the projects' design. The goal is to ensure that the project 'fits' the community and meets its needs, as well as the state's transportation system. The process "has led directly to the inclusion of bicycle and pedestrian elements in projects that may not have previously had them prior to CSS" (pg. 32).

NHDOT allocates funds to municipalities through the traditional Transportation Enhancements (TE) program, the Safe Routes to Schools (SRTS) program, and the Congestion Mitigation Air Quality (CMAQ) program to "oversee the design and construction of planned bicycle and pedestrian infrastructure" (pg. 32). The TE program provides federal funds to communities to implement planned bicycle and pedestrian improvements, and has been successful by allowing municipalities to manage the projects, overseeing design and construction.

Bike-Ped Related Goals

The LRTP document has a variety of goals and objectives. Goal 2: Mobility & Modal Choice is described as to "provide mobility, accessibility, and modal choice to meet existing and future travel needs of people and goods" (pg. 44). The objectives for Goal 2 include "increase the use and availability of transit, rideshare, bicycle and pedestrian modes" (pg. 44).

10.5 NHDOT Strategic Highway Safety Plan, 2017

The Strategic Highway Safety Plan (SHSP) is a guide for "federal, state, and local agencies; planning commissions; the private sector; and concerned citizens working together to reduce crashes, injuries, and deaths on New Hampshire's roads" (pg. 5). Since 2007, five-year traffic fatalities have been on a downward trend. The goal of the New Hampshire Driving Toward Zero Coalition is committed to reducing fatalities on New Hampshire's roads. The strategies to achieve that goal include:

- Develop emphasis area action plans
- Link with other transportation plans
- Develop a communication plan and continue to identify ways to create outreach opportunities to raise awareness and to educate the citizens of New Hampshire about roadway safety
- Create targeted messaging and high visibility enforcement

Bike/Ped related emphasis areas addressed by the SHSP include:

- Impaired driving
- Distracted driving
- Speeding
- Teen traffic safety
- Older drivers
- Crash locations
- Vulnerable roadway users
- Education and public outreach

Impaired Driving + Distracted Driving

Between 2010 and 2014, New Hampshire and the U.S. have seen approximately 30% of traffic fatalities a direct result of alcohol. 2015 was "the first year that drug use was more prevalent than alcohol use in fatal crashes." New Hampshire state law "bans the use of handheld electronic devices while driving or temporarily halted in traffic. Bluetooth or other hands-free electronic devices are allowed." (pg. 20.) Distracted driving accounted for 10% of traffic fatalities in 2014.

Among the myriad continuing strategies for both emphasis areas, "Add centerline and shoulder rumble strips on New Hampshire roadways, where warranted" has the largest potential influence on the planning of pedestrian and bicycle facilities.

Speeding + Crashes

Among the strategies to achieve the goal of "eliminate speeding on Hew Hampshire roadways and the fatalities and serious injuries that occur as a result of crashes caused by speeding" (pg. 25). Similar to speeding, the goal to "reduce roadway crashes resulting in fatalities and serious injuries by 50% by 2030" (pg. 41) both include a focus strategy with potential influence on the planning of pedestrian and

bicycle facilities. That goal is to "add curve warning signs on New Hampshire roadways per the Manual on Uniform Traffic Control Devices (MUTCD)" (pg. 25). An additional focus strategy under the speeding goal is to "Evaluate, standardize, and install delineation, signing, and pavement markings on curves" (pg. 42).

Jeff Brillhart, Former Assistant Commissioner of NHDOT, and Rick Schoefer, Hopkinton Fire Department Chief are both quoted in the report as linking the dramatic decrease in roadway departure crashes with the installation of rumble strips along State Routes 202 and 9.

Vulnerable Roadway Users

Challenge: "Between 2010 and 2014, 11 bicyclists and 46 pedestrians were killed on New Hampshire roadways" (pg. 46). Goal: The goal is to reduce crashes involving all vulnerable road users, including motorcyclists, pedestrians, and bicyclists and to improve crash data collection. Additional goals are to improve "education, training, and public awareness of vulnerable road users, leading to the elimination of fatalities and serious injuries for this group" (pg. 47).

Continuing strategies aimed at reducing crashes and increasing awareness include: (all from pg. 49)

- "Consider vulnerable road users in the design, construction, and maintenance of roadway infrastructure. Recommend the use of Complete Streets concepts in Designs."
- "Encourage passing a Vulnerable Roadway User Law."
- "Education and awareness of motorcycles, bicycles, and pedestrians:
- "Create a pamphlet of what has changed in laws over the last 20 ears t be given to drivers when they renew their license"
- "Develop Public Service Announcements"
- "Education should focus on raising awareness of existing laws: 3-foot passing rule, helmets for those under 16 on bicycles:
- "Identify and implement best practices for improving pedestrian and bicycle safety"
- "Support vehicular cycling classes for 14 to 15-year-olds"
- "Encourage transit agencies to place bus stops on locations that can be safely accessed, and seek funding as needed to improve the safety of roadway crossings with lighting, flashing beacons, and HAWK beacons"
- "Increase funding for pedestrian safety infrastructure and non-infrastructure projects"
- "Improve collection, use, and analysis of data needed for pedestrian safety planning and programming"
- "Increase pedestrian safety-focused coordination among state, regional, and local agencies, including transportation planning and land use efforts"
- "Improve roadway and bikeway planning, design, operations, and connectivity to enhance bicycling safety and mobility to all destinations"
- "Encourage more bicycle travel by improving public attitudes about bicycling as a safe mode of transportation"