2040 Long Range Transportation Plan

Public Comment Draft
9/8/2017

ROCKINGHAM PLANNING COMMISSION

This document has been prepared by the Rockingham Planning Commission in cooperation with the U.S. Department of Transportation - Federal Highway Administration; the New Hampshire Department of Transportation; and the Federal Transit Administration. The contents of the report reflect the views of the authors who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Highway Administration, the New Hampshire Department of Transportation, or the Federal Transit Administration. This report does not constitute a standard, specification, or regulation.

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1. Introduction

The Rockingham Planning Commission region's vitality and the quality of life for its residents depend greatly on the mobility of people and goods, the accessibility of destinations by multiple modes of travel, and the safe accommodation of all users of the transportation system. The region enjoys a strong interregional backbone transportation system, with an excellent highway network, airport, deep water port and intercity bus and rail access. Public transit and human service transportation are more readily accessible in the region than in many parts of the state, between the COAST and CART public transit systems and non-profit providers. The region has seen improvement in travel options in the past decade, with the expansion of transit services and greater attention to bicycle and pedestrian accommodation.

At the same time the region, and the state as a whole, face significant challenges in maintaining, modernizing and improving the safety of our transportation system. Among these are changing travel demand patterns associated with economic change and demographic shifts; and perennial funding constraints. New Hampshire suffers from a lack of funding for the transportation system in general, including system maintenance and operation, and there is a particular lack of funding for modes other than highways. Public transportation availability varies significantly across the region by community, with major gaps in access in the middle of Rockingham County. Total traffic volume, which had leveled off and in fact declined during the economic downturn, has again begun to climb with potential implications for congestion and capacity. Observed and projected patterns of more severe coastal flooding related to storm events and sea level rise will increasingly impact transportation infrastructure along the coastline. Lastly, the aging of the Baby Boom generation will result in a near doubling of the senior population in the coming 25 years, creating demands for new transit options and other changes to the build environment to support aging in place. These existing conditions, system needs and challenges are set out in greater detail in the following pages, together with regional goals and strategies to improve mobility, accessibility, and safety; and otherwise maintain and enhance the region's economic vitality and quality of life.

Purpose and Scope

This Transportation Plan serves as the short and long-range transportation planning document for the Rockingham Planning Commission (RPC), which is the designated Metropolitan Planning Organization (MPO) for the area and includes 27 Communities in Southeastern New Hampshire (***Map 1-1***). The plan examines current regional conditions, takes into account updated

RPC Communities covered by this Plan:

Atkinson
Brentwood
Danville
East Kingston
Epping
Exeter
Fremont
Greenland
Hampstead
Hampton
Hampton Falls
Kensington
Kingston
New Castle
Newfields
Newington
Newton
North Hampton
Plaistow
Portsmouth
Raymond
Rye
Salem
Sandown
Seabrook
South Hampton
Stratham

socioeconomic projections and changing growth patterns, and describes the financial resources available through current law and policy and how well those meet the identified transportation needs for the region.

Shaped by these factors, the plan sets out the region's adopted goals, strategies for achieving those goals, performance metrics for measuring progress in implementation, and specific project proposals to improve the transportation system through the year 2040.

It is in compliance with the ***Fixing America's Surface Transportation Act*** (FAST Act), and addresses a minimum twenty-year planning horizon (22 years at adoption) as directed by the FAST Act's planning standards.

The plan has been developed as part of the region's continuing, cooperative, and comprehensive planning process, which considers all transportation modes and supports metropolitan community development. It reflects the goals and objectives of member communities in their own master plans and policies, of the NH Department of Transportation in its Long Range Transportation Plan, as well as those established by the Rockingham Planning Commission via the Regional Master Plan and the MPO process.

The responsibilities for carrying out transportation planning are specified in a Memorandum of Understanding between the New Hampshire Department of Transportation (NHDOT), Rockingham Planning Commission and the three transit agencies serving the region: the Cooperative Alliance for Seacoast Transportation (COAST), the Greater Derry-Salem Cooperative Alliance for Regional Transportation (CART), and the University of New Hampshire Wildcat Transit system.

The Planning Process

The Long Range Plan is generally developed by the RPC as illustrated in Figure 1.1. In accordance with FAST Act, the MPO must review and update the transportation plan at least every five (5) years in air quality attainment areas. Updates must, at a minimum confirm the validity and consistency of the Plan's major assumptions regarding forecasted land use and transportation assumptions for the region. To maintain consistency with the State's two-year update cycle of the New Hampshire Ten Year Transportation Plan, the MPO will update the project-specific aspects of the Plan every two years as needed. Such shorter term updates will be timed so as to occur concurrently with the biennial TIP development process.

The goals, needs and strategies identified in this Plan have been developed based on extensive public input gathered as part of the most recent update to the RPC's Regional Master Plan and other public engagement efforts over the past three years. These efforts have included outreach to stakeholders already active in the transportation planning process, but also input from the community at large that may not otherwise attend a transportation planning forum. As part of the MPO's Environmental Justice and transit coordination work, there has also been targeted outreach to groups particularly likely to have unmet transportation needs, and from specific sectors such as senior citizens and individuals with disabilities and low income populations. These outreach efforts have included:

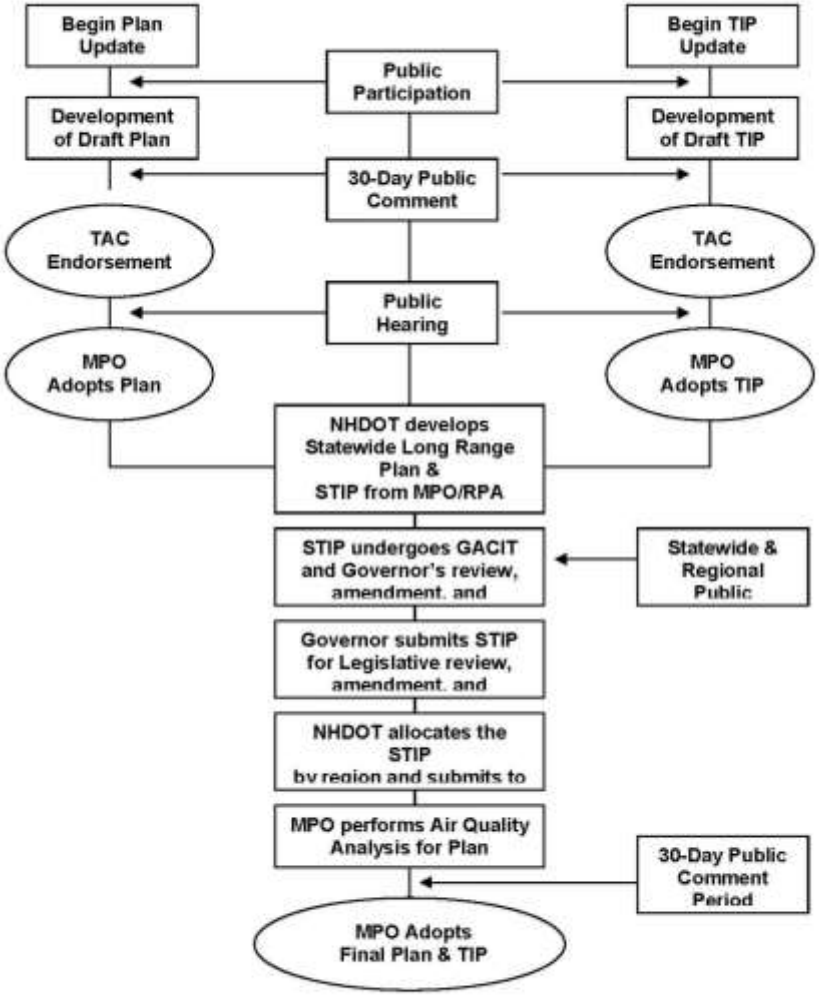
- A telephone survey of 2,935 randomly-selected households across New Hampshire, including 400 in the MPO region, conducted by the UNH Survey Center;

- A non-random-sample on-line survey of key MPO stakeholders and other members of the public using the same survey instrument;
- Three public forums around the region focused on transportation needs as well as broader regional issues;
- Focus groups with professional planners, senior citizens and individuals with disabilities in the MPO region;
- Surveys of local welfare officers, non-profit human service agencies, and populations likely to have unmet transportation needs (seniors, individuals with disabilities, low income individuals;
- Collaborative work with the other New Hampshire MPOs to evaluate potential performance metrics, including an extensive set of stakeholder interviews;
- Several working sessions with the MPO Technical Advisory Committee regarding plan structure as well as goals and strategies.
- Public comment period for review of the Draft Long Range Plan documents.

A full description of findings from the public participation process is included in Appendix A – Public Participation Summary.

The plan is ultimately adopted by the MPO Policy Committee, made up of representatives from the twenty-seven member communities as well as agency representatives from the New Hampshire Department of Transportation (NHDOT), the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), and the Air Resources Division of the New Hampshire Department of Environmental Resources (NHDES). Also involved in the MPO planning process are representatives from three regional transit providers: the Cooperative Alliance for Seacoast Transportation (COAST) and the Cooperative Alliance

FIGURE 1.1
DEVELOPMENT OF THE TRANSPORTATION PLAN & TRANSPORTATION IMPROVEMENT PROGRAM (TIP)



Acronym Glossary: MPO = Metropolitan Planning Organization; NHDOT = NH Department of Transportation; TAC = Technical Advisory Committee; TIP = Transportation Improvement Program; STIP = State Transportation Improvement Program; GACIT = Governor's Advisory Committee on Intermodal Transportation; RPA = Regional Planning

for Regional Transportation (CART), University of New Hampshire Wildcat Transit; and the Pease Development Authority (PDA). A full list of the current Commissioners is included in the MPO Prospectus which is available at the RPC website (http://www.rpc-nh.org/docs.htm).

Plan Structure & Contents

The Long Range Plan is composed of both FAST Act required elements as well as other components that, while not required, help provide a more complete picture of the transportation system and future needs. The plan is organized into seven chapters. The intent is that the structure enables readers to more quickly find the information that they are seeking by simplifying the organization and developing chapters that can each be considered a standalone document, or all taken together. The seven chapters are:

Chapter 1: Introduction. This chapter summarizes the MPO's responsibilities under the Federal transportation planning process, the scope and structure of the plan, and the extensive public input process that has shaped the plan.

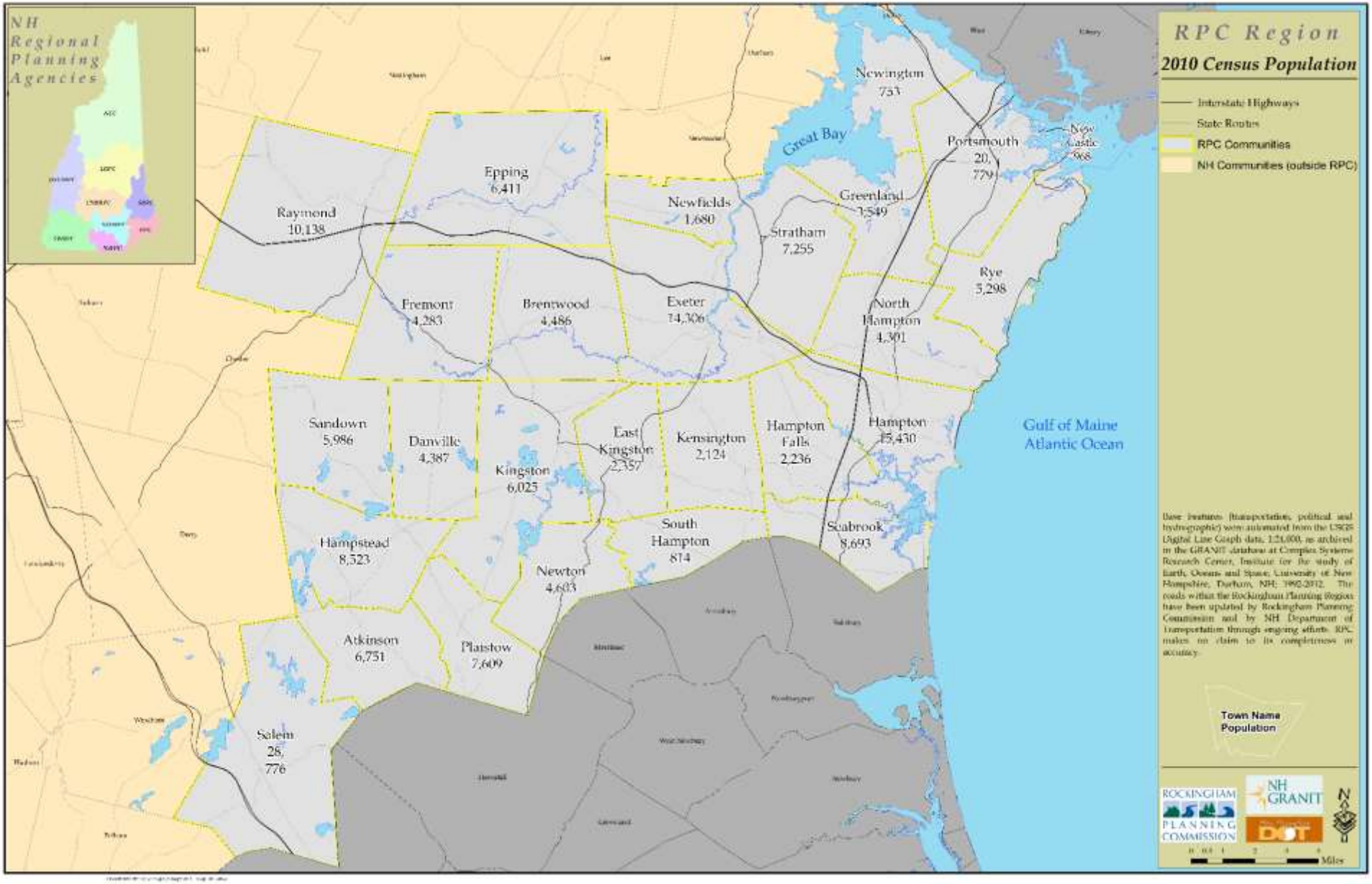
Chapter 2: Planning Framework. This chapter sets out the MPO's Goals for the regional transportation system and the transportation planning process, and describes the broader planning context in which the MPO works, including Federal requirements, the New Hampshire Livability Principles, and the Regional Vision for the RPC region as defined in the Regional Master Plan.

Chapter 3: Existing Conditions. This chapter provides the background information on the region. This includes a description of land use patterns, demographic data and commuting travel patterns, as well as overviews of the modal components of the transportation system, including Highways, Bicycle and Pedestrian Facilities, Public Transportation, Transportation Demand Management, and Freight Transportation facilities and programs.

Chapter 4: Trends & Anticipated Future Conditions. This chapter provides a context for future transportation system needs based on regional growth and forecasting. A needs assessment is structured around the Plan's nine goal areas. Scenarios for various growth patterns demonstrate alternative plans for future development. The region's needs are projected based on these scenarios.

Chapter 5: The Constrained Transportation Plan. This chapter lists those projects that are feasible given existing and expected financial resources as well as other limitations as required by the FAST Act. The project listing is organized into the Transportation Improvement Program (TIP) which lists the first four years of projects (2018-2021) and the Plan projects which are the remaining years of 2022 to 2040.

Chapter 6: Implementation Strategies. This chapter sets out a range of actions for the MPO, member municipalities and other stakeholders to move the region toward attaining the Plan's stated goals. Implementation strategies are organized by goal area, including Mobility, Transportation Choices, Integrated Planning for Transportation & Land Use, System Preservation & Modernization, Energy & Environment, Safety, Economic Vitality, Resiliency, Public Health, Efficient Planning Process, and Resource Availability. Certain strategies are cross cutting and will help in attaining multiple goals, and these are identified accordingly.



Map 1-1 – Rockingham Planning Commission Region MPO Region

2. Planning Framework

The planning framework establishes the foundation of the planning process in the Regional Master Plan for the Rockingham Planning Commission region and guides the development of the Long Range Transportation Plan around the principles, vision, goals and recommendations of that document. In addition, the planning framework incorporates the federal planning factors and performance based (3Cs) transportation planning process and the project selection criteria that are utilized to prioritize projects for funding.

New Hampshire Livability Principles

Working with the other New Hampshire Planning Commissions as part of a Sustainable Communities Initiative grant from the US Department of Housing and Urban Development, the RPC developed a Regional Master Plan constructed around a common set of livability principles. These values are grounded in the New Hampshire Smart Growth Principles found in NH RSA 9-A, the Federal Partnership Livability Principles that guide the HUD-EPA-DOT Sustainable Communities Program, as well as the visions, goals, and objectives in local master plans and other documents concerned with the future. While only one of these principles directly addresses transportation issues, all impact, or are related to, the transportation system in some manner.

1. Traditional Settlement Patterns & Development Design
Keep the traditional New Hampshire landscape intact by focusing development in town centers and village areas, while leaving open and rural areas for agriculture, recreation, and other suitable uses.

2. Housing Choices
Ensure that everyone, regardless of income level, has convenient and affordable choices in where they live. This includes a variety of housing options and ownership types that appeal to people at any stage of life and is convenient to where they work, shop, and play.

3. Transportation Choices
Provide a number of options that help people safely and efficiently get where they need to go, whether it is by walking, driving, biking, public transportation, carpooling, or taking a train or plane. Transportation networks should make it easy to get from one place to another, and should also allow the efficient movement of goods to support the economy (commercial freight, rail, and air transport).

4. Natural Resource Functions and Quality
Make sure that we protect New Hampshire's beautiful natural landscape, which is home to all of us as well as a wide range of wildlife species. This includes protecting and improving the water we drink, the air we breathe, the forests we love, and the farmland that sustains us.

5. Community and Economic Vitality
Continue to make New Hampshire a great place in which to do business, raise a family, recreate, visit, and retire. Our neighborhoods and communities offer opportunities for an excellent education, good health, cultural happenings, and social connections.

6. Climate Change and Energy Efficiency

Identify opportunities to save energy and costs and reduce risks to our communities, businesses and citizens. In recent decades, New Hampshire has seen an increase in extreme storms and flooding coupled with steadily rising fuel and energy prices. How can we reduce dependence on outside sources of energy, construct homes and buildings that are more efficient, and reduce impacts to our communities and infrastructure from extreme storms and flooding?

Vision for 2040

The 2040 Regional Master Plan for the Rockingham Planning Commission includes the formation of a shared vision for the future region. This Vision is crafted around ideals espoused in local master plans, past regional master plans, and through input from RPC Commissioners and the general public during the plan development process and represents a compelling picture of the RPC region of the future that balances local and regional needs:

The southeastern New Hampshire region enjoys a high quality of life represented by a strong regional economy, distinct community character, and outstanding natural and recreational resources. This has been achieved through careful planning, wise stewardship of natural resources, infrastructure investment, and increasing regional cooperation on shared issues. This vision is supported when:

- Communities are working together to ensure that long-term economic, social and environmental factors are balanced in the planning and decision-making process.
- Development and redevelopment are enhancing and strengthening community centers, preserving rural character, and maintaining traditional landscapes. This provides open space for agriculture, recreation and wildlife areas, and protection of natural resources, while providing residents with a variety of choices for places to live, work, and play.
- Communities are allowing a variety of housing choices for residents of all income levels to strengthen our communities and economic vitality.
- We are investing in the infrastructure systems that support our communities and businesses.
- The region is promoting economic opportunities that result in more high quality jobs, stable property tax rates, enhanced educational opportunities, and improved services for residents and businesses.
- We are striving to protect our natural environment so residents can benefit from its resources without diminishing its quality for other living creatures and future generations.
- Our sense of community is being preserved by protecting and actively using the region's historical resources and cultural heritage.
- Communities are acknowledging and planning for the effects of a changing climate. Anticipated changes include sea-level rise, increasing flood events, more erosion, periods of drought and other natural hazards.
- Residents, businesses, and communities are adapting to the high cost of energy by implementing efficiency measures for building, increasing public transit options, and developing local renewable energy resources.

- Communities are respectful of property rights in their efforts to manage growth and development.

Regional Goal

To support the Regional Vision and the New Hampshire Livability Principles, a regional goal was developed to better describe the desired end state:

Promote efficient use of land, resources and infrastructure in southeastern New Hampshire that:

- Creates a high quality built environment while protecting important natural and cultural resources.
- Promotes positive effects of development and minimizes adverse impacts.
- Promotes economic opportunities and community vitality.
- Enhances the coordination of planning between land use, transportation, housing and natural resources.
- Considers and incorporates climate change into local and regional planning efforts.

Federal Planning Factors

When developing the Long Range Transportation Plan and other transportation planning documents, the ten planning factors identified in 23 U.S. Code § 134 (23 C.F.R. Part 450.306 of the Planning Regulations) must be considered. Like the New Hampshire Livability Principles these provide broad-based guidance and apply to multiple aspects of the planning process:

1. Support the economic viability of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency;
2. Increase the safety of the transportation system for motorized and non-motorized users;
3. Increase the security of the transportation system for motorized and non-motorized users;
4. Increase accessibility and mobility of people and freight;
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
7. Promote efficient system management and operation;
8. Emphasize preservation of the existing transportation system;
9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation; and
10. Enhance travel and tourism.

Performance-Based Approach

Performance-based planning methods help transform long-term, broad visions of the future into measurable goals and objectives, which can be used to guide decisions and measure success. There are a number of benefits to this approach:

- Improved decision-making regarding infrastructure investments
- Improved return on investments and resource allocation
- Improved system performance
- Increased accountability and transparency
- Demonstrates link between funding and system performance

This update to the Long Range Transportation Plan is the first attempt by the MPO to implement performance-based planning as required by FAST. This work is being completed in conjunction with a cooperative effort of the four New Hampshire MPOs to implement the 21 currently known and required federal performance measures, and to develop a common set of vetted supplemental performance measures, that can be utilized by MPOs as needed. Several of the FHWA performance measures are not required to be fully integrated into the MPO LRTP and TIP until after May, 2018 and there are still FTA Safety measures that have not been released. For that reason, this update to the LRTP will represent a partial implementation of the performance-based planning requirement that will be updated as the remaining measures are integrated.

National Performance Goals

The Moving Ahead for Progress in the 21st Century Act (MAP-21) and the subsequent Fixing America's Surface Transportation (FAST) Act, extended these planning factors by establishing seven National Goals for the Federal Aid Highway System. These national goals constitute a set of broad, over-arching requirements that must be incorporated into planning documents and processes as a basis from which progress can be measured on solving the problems of the current transportation system.

1. **Safety** – To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
2. **Infrastructure Condition** – To maintain the highway infrastructure asset system in a state of good repair.
3. **Congestion Reduction** – To achieve a significant reduction in congestion on the National Highway System.
4. **System Reliability** – To improve the efficiency of the surface transportation system.
5. **Freight Movement and Economic Vitality** – To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
6. **Environmental Sustainability** – To enhance the performance of the transportation system while protecting and enhancing the natural environment.
7. **Reduced Project Delivery Delays** – To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

National Performance Measures

Performance measures are utilized to assess progress towards meeting broad goals and objectives and define precisely how that progress will be measured. Within a performance based planning process, performance measures serve to clarify the definition of goals, monitor performance over time, are used as a reference point for target setting, form the basis of policy and investment decisions, and allow planners and the public to assess the effectiveness of projects and strategies in achieving goals and objectives. The Federal Highway administration (17) and Federal Transit Administration (4) have established 21 required metrics (so far) that each MPO must utilize as part of the transportation planning process. These metrics are focused on addressing aspects of the National Performance Goals and covering the following areas:

- Pavement condition on the Interstate System and on remainder of the National Highway System (NHS)
- Performance of the Interstate System and the remainder of the NHS
- Bridge condition on the NHS
- Fatalities and serious injuries—both number and rate per vehicle mile traveled--on all public roads
- Traffic congestion
- On-road mobile source emissions
- Freight movement on the Interstate System
- Transit Asset Management
- Transit Safety

Within one year of the release of final rules on each of these performance areas, State DOTs must establish performance targets for urbanized and rural areas in coordination with MPOs and public transportation providers. Further, the MPOs themselves set targets within 180 days of the State, again in coordination with the State and public transportation providers.

Targets are in place for the State and transit operators relating to Transit Asset Management and must be in place for MPOs by June 30, 2017. Safety related targets are currently being developed at the State level for an August, 2017 deadline and will be followed by MPO targets in February, 2018.

MPO Goals & Performance Measures

The MPO has developed a set of goals based on the New Hampshire Livability Principles, the Regional Master Plan Vision and Goal, and the Federal Planning Factors and the National Goals for the Federal Aid Highway System as well as past iterations of the Long Range Transportation Plan. These goals are intended to aid in directing transportation funding and prioritizing regional transportation projects and for that reason have been coordinated with a set of performance measures for the transportation system. ***Table 2-1*** provides the connection between the 11 regional transportation goals and the Federal Planning Factors, National Performance Goals, Known Federal Performance Metrics, New Hampshire Sustainability Principles, and the Regional Vision and Goals as expressed in the RPC Regional Master Plan.

Goal 1 - Mobility

The region's transportation system offers safe, secure, efficient, and reliable access to employment, housing, commerce, services, entertainment, and recreation.

Goal 2 – Transportation Choices

The region's transportation system offers equitable and reliable multi-modal transportation choices to better connect people to jobs and services.

Goal 3 – System Preservation & Modernization

The region's transportation system is maintained in good condition and the preservation and modernization needs of existing components are prioritized ahead of adding new highway capacity.

Goal 4 - Safety & Security

The region's transportation system is safe and secure for all users.

Goal 5 – Land Use Integration

New commercial and residential development supports multiple modes of transportation and minimizes the need for expanding capacity of adjacent roads

Goal 6 – Resource Protection

The region's transportation system is proactive in protecting natural and historic resources; and is forward looking regarding energy use, energy efficiency and conversion to renewable energy sources.

Goal 7 – Resiliency

The region's transportation system is adaptive and resilient to climate change and natural and other hazards.

Goal 8 - Economic Vitality

Through strategic investment, the region's transportation system supports an innovative and competitive 21st century economy that connects people, goods, and communities to desired activity and economic centers.

Goal 9 - Public Health

The region's transportation system is designed and built to support safe and healthy communities, facilitate active living opportunities, and aging in place.

Goal 10 - Efficient and Effective Planning Process

The MPO provides an efficient and effective implementation of the cooperative, coordinated, and continuous (3C) federal transportation planning process that aids in the efficient and effective implementation of projects.

Goal 11 – Funding Availability

Adequate and predictable funding is available to meet current and future needs for transportation system maintenance, operation and modernization across all modes.

Performance Measures and Targets

Performance measures and targets provide a direct and measurable connection between the regional goals as established in the Long Range Transportation Plan and specific desired outcomes. Federal regulations require that the MPO set targets in relation to the national performance measures described earlier in this chapter, and that those targets be included in any MPO Long Range Transportation Plan updates after May 1, 2018. US DOT also encourages the inclusion of other metrics that reflect regional goals and priorities not covered under the national performance goals.

The MPO is currently in the process of implementing performance measures and targets for the National Performance Goals as required by Federal regulations as well as establishing a set of supplemental measures that ensures that each of the twelve MPO Transportation Goals has at least one metric to gauge progress against. ***Figure 2-1*** indicates which goals have Federal Performance Metrics as well as those for which supplemental measures are being developed in conjunction with the other New Hampshire MPOs. As this process is not complete, these measures are not included in the Long Range Plan at this time, although they are referenced in general terms throughout the document. In some cases, such as related to traffic safety, the process is further along and may include more detail and related data than in other areas of measurement.

Figure 2-1: Connections between Federal and Regional Goals

RPC MPO Goal	Federal Performance Goal	Federal Performance Metrics	Planning Factor	NH Livability Principle	Component of Regional Vision and Goal?
Goal 1 - Mobility	FG3, FG5	Multiple	PF4	LP3	Yes
Goal 2 - Transportation Choices	No FG	No*	PF4	LP2, LP3	Yes
Goal 3 - System Preservation and Modernization	FG2, FG3, FG4	Multiple	PF8	LP3	Yes
Goal 4 - Safety & Security	FG1	Multiple	PF2, PF3	LP2	Yes
Goal 5 - Land Use Integration	No FG	No*	PF6	LP1, LP2, LP5	Yes
Goal 6 - Energy & Environment	FG6	Yes	PF5, PF9	LP4, LP6	Yes
Goal 7 - Resiliency	No FG	No*	No PF	LP6	Yes
Goal 8 - Economic Vitality	FG4, FG5	No*	PF1, PF10	LP5	Yes
Goal 9 - Public Health	No FG	No*	PF6	LP1, LP2, LP3, LP5	Yes
Goal 10 - Efficient and Effective Planning Process	FG7	No*	No PF	None	Yes
Goal 11 - Resource Availability	FG7	No*	No PF	None	Yes

FG = Federal Goal & relates back to the National Performance Goals described on page 2-5
PF = Planning Factor & relates back to the Planning Factors described on page 2-3
LP = NH Livability Principle & relates back to those described on pages 2-1 & 2-2
* The MPO is in the process of developing a set of performance measures that supplement the Federal Performance Metrics and ties each of the MPO Goals to at least one measurable outcome

Project Selection Criteria and Process

In a 2012 statewide effort involving all nine planning commissions, NHDOT, and FHWA, it was determined that the best approach to prioritizing projects was to first examine projects for eligibility and feasibility, and follow that by scoring those eligible and feasible projects against a common set of selection criteria. Once that had been determined, it was left to the individual agencies to establishing the relative weights of each of the selection criteria to establish priorities within their regions. The most recent iteration of this biennial process was completed by the MPO Transportation Advisory Committee at the February 23rd, 2017 meeting and that established the relative weights as shown below. The project selection criteria were defined and applied as follows:

- **Congestion (10.36%):** The extent to which the project is intended to reduce traveler delay. Estimated based on scope of project, location, and current levels of congestion.
- **Freight Mobility (5.16%):** The degree to which the project impacts the movement of goods. Estimated based on perceived utility as a freight corridor.
- **Alternative Modes (13.87%):** The extent to which the project impacts accommodations for alternative modes of travel. Does the project improve access to goods and services for people without a car.
- **Traffic Volume (8.47%):** The highest volume project location receive the highest score and the lowest volume project location receives the lowest score.
- **Facility Importance (6.9%):** Based on Functional classification. Higher classes of roadways receive higher scores. This reflects NHDOT's "Tiered" approach.
- **Safety measures (16.96%):** To what degree is the project oriented towards making the roadways safer. Is the project purpose primarily safety or is it something else.
- **Safety Performance (6.06%):** Relative crash frequency at the location based on the last 5 years of data (2009-2013). Crash severity is also considered.
- **Service Life Remaining (3.79%):** The physical condition of the road and remaining useful life of the pavement. Roadways in better condition will score higher. Currently this is based on the same information from 2013 and 2014, but will be updated when the new data is received from NHDOT.
- **Current Bridge Condition (9.67%)**: The physical condition of the bridge and those in the worst condition (Red List) will score higher. Currently this is based on the same information from 2013 and 2014 but will be updated when the new data is received from NHDOT.
- **Support (18.8%):** The regional priority of the project. This includes consideration of the local priority, potential economic impacts, the degree to which the project supports the vision, goals, and objectives of the region, as well as whether the project is listed in local or regional planning documents.

In December 2016, the MPO solicited projects from the communities in the region to be considered for inclusion in the MPO Long Range Transportation Plan as well as to be prioritized for potential inclusion in the State Ten Year Transportation Plan.

3. Existing Conditions

The following pages offer an overview of land use patterns, demographic and socioeconomic makeup and commuting travel patterns in the MPO region, as well snapshots of the modal components of the transportation system, including highways, bicycle and pedestrian facilities, public transportation, transportation demand management, and freight transportation facilities and programs.

Population & Growth

Demographic conditions and trends significantly influence the trajectory of the region's future development, land use, housing, and infrastructure needs; along with virtually all other aspects of planning. For most of the past 50 years, the RPC has been strongly influenced by rapid population growth. The population of the region doubled between 1960 and 1990, and at times during the 1970s and 1980s several towns in the region grew at a faster pace than any in the state. The number of people added between 1956 and 1990 averaged nearly 2,750 per year. The growth rate began to drop substantially after 1990, slowing to about 1,700 people a year between then and 2000, and slowing even further between 2000 and 2010 to about 1,000 persons per year across the region (Figures 3-1 and 3-2). More recently, population growth has slowed further with State Office of Energy and Planning estimates adding just under 3,100 people (about 620 per year) to the region between 2010 and 2015.

Figure 3-1: Census Population of Region

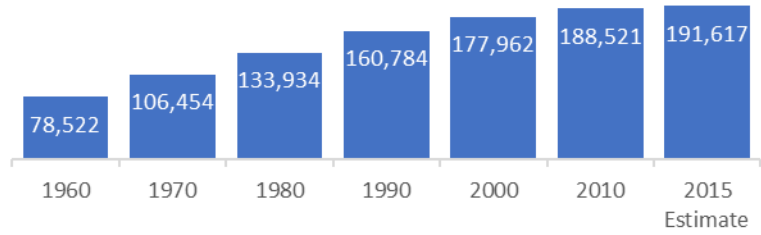
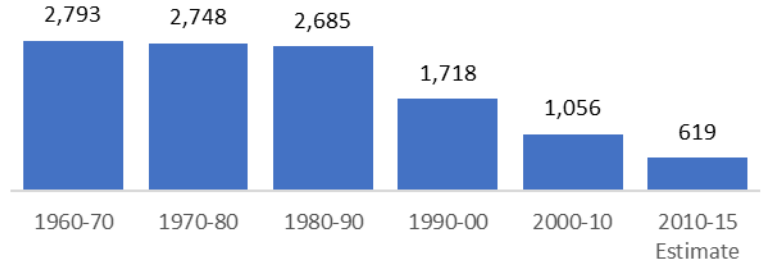
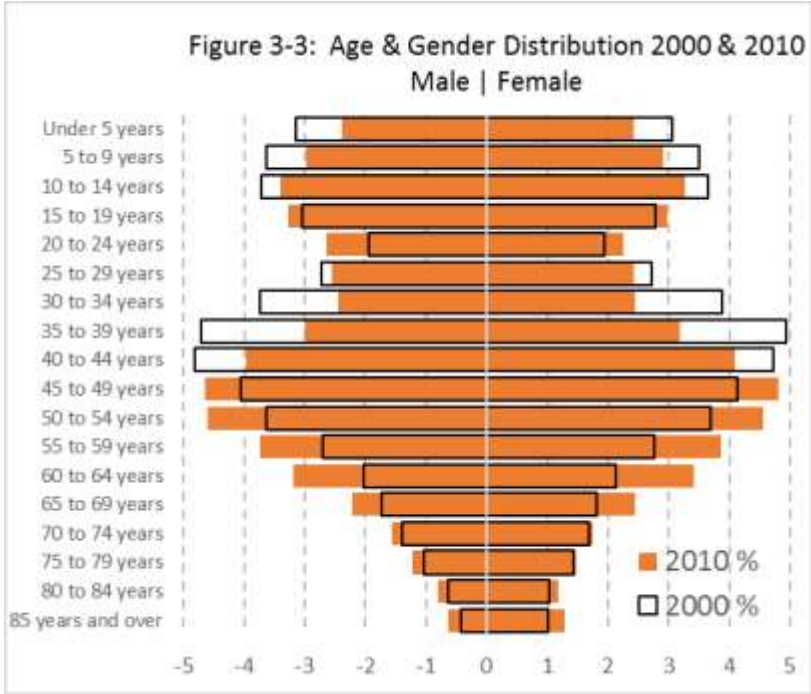


Figure 3-2: Ave Population Growth per Year by Decade

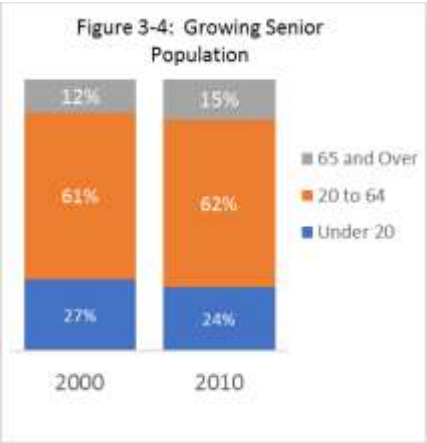


Age Demographics

Demographically, the region is trending older with fewer children being born in the area. Figure 3-3 compares the distribution of the population by 5-year age and gender cohorts for 2000 and 2010. During that time period, it can be seen that the percentage of the population for each cohort under age 15 is decreasing over the ten years, while the population of each group between 25 and 44 is

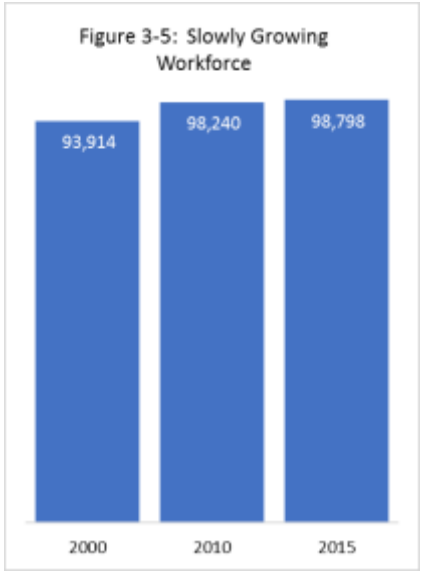


also decreasing. Cohorts for groups 45 and older all increased between 2000 and 2010. This trend is expected to continue as the Baby Boomer generation enters retirement years with smaller sized cohorts following. This produced a net increase of nearly 6000 individuals 65 and older which is 26% increase over 10 years. This shift translates to an overall percentage increase in the population in the population of residents aged 65 and over from 12 % to 15 % of the total population, and a similar decrease in those under 20 from 27% to 24% over the same time period.



Labor Force

From the 1960's onward, the national work force participation rate grew from about 59% of all individuals 16 and over to over 67% when the rate peaked in 1997-2000. Since that time, participation in the labor force has declined due to demographic, structural, and other factors and the current rate has hovered around 63% since 2013 (Toossi, 2015). This does not mean that the work force has not grown, however, as population growth has been sufficient to offset the declining participation rate. In New Hampshire, the seasonally adjusted labor force has grown from just over 620,000 in 1990 to nearly 743,000 in 2015 according to the Economic and Labor Market Information Bureau. In the RPC region, growth in the total labor force has been occurring as well, although at a very slow pace (.3% per year since 2000) with approximately 5,000 potential workers added to the region over the last 15 years. This mirrors the larger demographic shift that has been seen (Figures 3-3 and 3-4) with the large "Baby Boomer" generation beginning to age out of the workforce in larger numbers and offsetting the growth in the work force to some degree.



Population Diversity

Figure 3-6 identifies of racial and ethnic minority residents for each municipality in the RPC region, as well as minority residents as a percentage of overall population. Region-wide minorities make up approximately 7.1 percent of the population, a very low

percentage by national standards and lower than the statewide average of 9.2 percent. This average is exceeded in five communities: Portsmouth (13.3 percent), Salem (13.1 percent), Raymond (8.3 percent), New Castle (8.3 percent) and Hampton Falls (7.2 percent). This is a significant increase since the 2000 census, when racial and ethnic minorities made up only 5.6 percent of the population statewide, and 3.5 percent of the population in the MPO region. Both the region's and state's population diversity is expected to slowly increase with time, but remain behind surrounding state's and regions.

Populations in Poverty

According to the U.S. Census Bureau, for 2014 the poverty threshold in the RPC region was approximately $24,000 for a family of four. **Figure-3-7** uses the American Community Survey 2014 5-year data compilation to show the number and percent of households in poverty by municipality in the Rockingham Planning Commission region. The mean percentage of households in poverty for the MPO region was 5.8 percent. In ten MPO communities the percentage of households in poverty exceeds this regional mean: Brentwood (7.4 percent), Epping (6.3 percent) Exeter (7.4 percent), Hampstead (6.2 percent), Hampton (7.1 percent), Newton (9.1 percent), Portsmouth (7.6 percent), Raymond (8.8 percent), Sandown (7.3 percent), and Seabrook (12.4 percent). Statewide, approximately 8.9 percent of the population falls below the federal poverty line, while nationally for 2014 an estimated 15.6 percent of the population lived in poverty.

This represents some change from the 2000 Census data, which showed five percent of residents in the region living in poverty. Several towns with above average populations in poverty in 2014 were below average in 2000. These include East Kingston,

Figure 3-6 – Minority Population by Census Tract

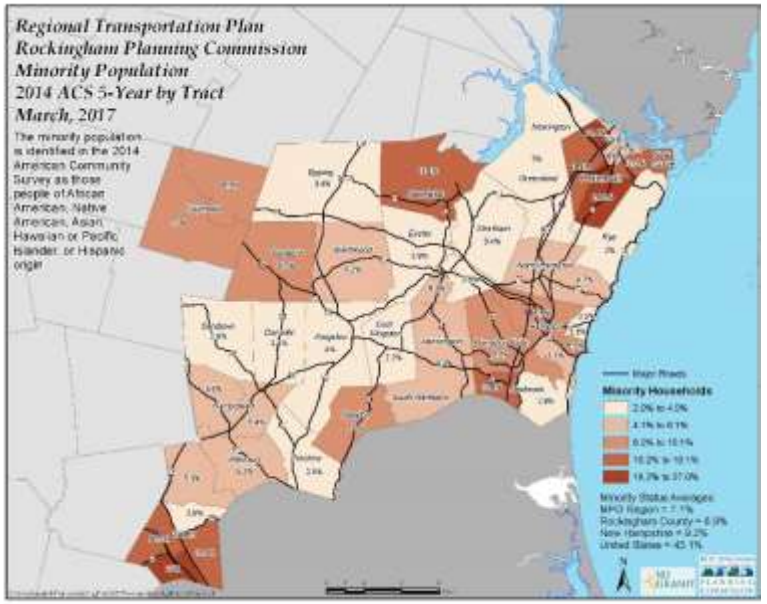
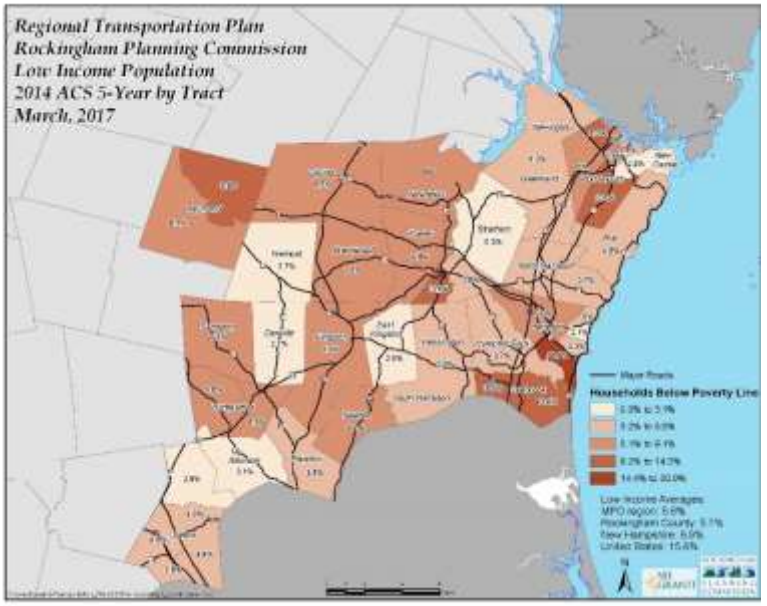


Figure 3-7 – Population in Poverty by Census Tract



Statewide, the percentage of households where costs for housing exceed 30% of income is similar to the other New England states. Contrary to expectations, the rate of overpayment in Rockingham County and the Seacoast region is only modestly higher due to higher household incomes in the region.

Greenland and Sandown. This may reflect demographic shift or may to some degree reflect sampling anomalies in these small towns. Hampton traditionally shows a high population in poverty due to short term winter rental residents in the beach district, while Portsmouth as the only city in the area, and a community with many students and retail workers, also traditionally shows above average poverty levels.

LAND USE

Transportation and land use are intimately linked. A new transportation infrastructure project such as expansion of a highway will spur housing and employment growth, and land development in the communities it serves. Likewise, an increase in population or employment in a sparsely settled area can overwhelm the existing road system and require major investment in new or expanded infrastructure. The prospect of cheaper land is usually a driving factor in the location of large new development projects on community outskirts and more rural areas, whether retail centers or high schools. However, the cost savings in land is often offset by a range of other costs. These include the cost to extend or expand roads and utilities to the site, the additional energy requirements, traffic congestion, limited access for those without automobiles, loss of open space, and increased air pollution as more people need to make more vehicle trips to access goods and services. The resulting development pattern has commonly become referred to as sprawl.

While many definitions of sprawl have been put forward in recent years, perhaps the simplest definition relates to the inefficient way such development consumes land. We are consuming land in the region at a greater rate than previous generations, and not just because population grew faster in the latter part of the 20th century than in prior periods.

Between 1953 and 1974, 0.75 acres of land were developed in Rockingham County for each person added to the population. Between 1974 and 1982, this rate of land consumption more than doubled to 1.59 acres per capita.

Many communities responded to growth in the 1970s through 1990s by establishing a low density development pattern through large lot zoning or soil-based lot sizing that could sustain both on-site septic disposal and private wells for water supply without the necessity of sewer or water or built in fire suppression systems. One result of this approach (called by some a 'sewer avoidance strategy') was growth that did not require large expenditures for physical infrastructure, except for schools. Another was that buildout of these communities would be limited to a density of less than 1 house per acre on average, thus retaining a non-urban, if not exactly rural, character. The dispersed land use pattern this creates is reflected in a comparison of population growth to traffic volume in the region. From 1982 to 1997 population in Seacoast New Hampshire grew by about 38%, while traffic volume in the region grew by 169% - a factor of more than 4 to 1.

The land use patterns in the region have a significant effect on its transportation system, and vice-versa. Unlike many regions of its size in the United States, the MPO region is fortunate to have a number of traditional downtown and village centers that remain active and viable.

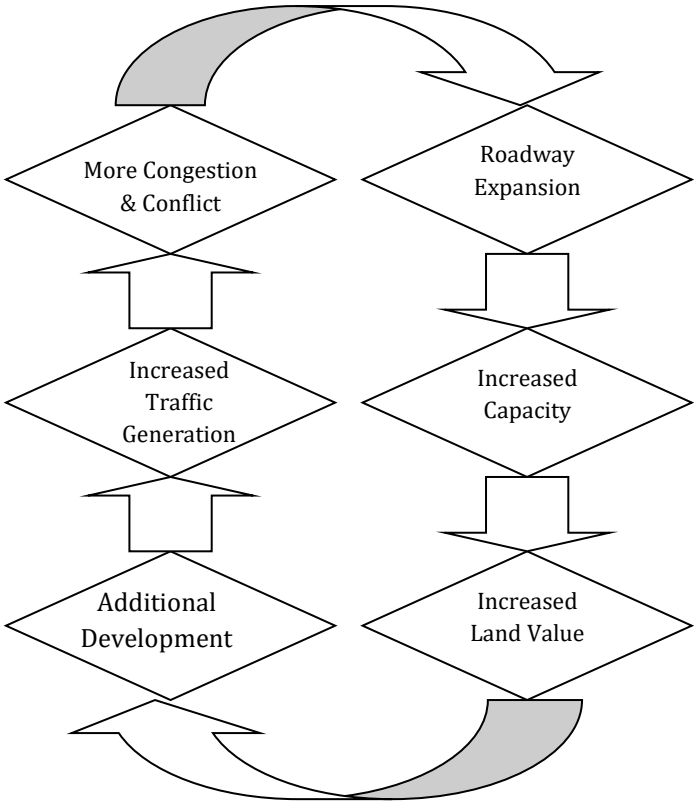


Figure 3-8 - The Transportation Land Use Cycle

"...this cycle continues until it is physically or economically impossible to further expand capacity. Access Management together with good land use controls can preserve highway capacity and effectively slow down or halt the cycle." -- FHWA Access Management Project

Nonetheless, much of the residential, commercial, and industrial development is dispersed, encouraging and sometimes necessitating a large amount of travel for individuals to work, shop, and fulfill their other daily needs. This sprawling development pattern makes it difficult for any mode other than the automobile to meet these needs.

The result is a high level of vehicle miles traveled (VMT) per capita and inefficient (if not infeasible) public transportation services. Not surprisingly, a large majority of the population uses private automobiles exclusively to meet their transportation needs. This increases traffic volumes, and places a greater demand on road infrastructure as the population grows. This pattern has also meant that individuals without access to an automobile encounter serious mobility problems. In turn, new road infrastructure needed to accommodate growth in traffic, encourages development and a continuation of dispersed land use patterns.

This pattern illustrates the classic example of inadequate integration of land use and transportation planning which has resulted in congestion, safety problems, lack of access by modes other than automobile, and eventual need for expensive capacity improvements on the roadways. This is the scenario of the "Transportation Land Use Cycle" depicted in ***Figure 3-8***. In this cycle a road with excess capacity attracts additional land development (often retail or commercial development in need of high visibility and access). This results in additional traffic generation and the erosion of highway capacity and function.

Eventually the congestion becomes severe enough that further expansion of the roadway is prompted, and the cycle begins again. This cycle can be seen along nearly every highway in the region from the strip commercial development on US 1 and NH 28 to large lot residential developments along Routes 121A and 108 among others. This pattern can also be seen in the relocation of public facilities such as schools, post offices, or court houses to the outskirts of town where land is inexpensive, but facilities are inaccessible by foot and difficult to access by bicycle or transit.

In the past decade there has been increased interest in multiple communities in the MPO region in shifting these patterns. Approaches have included updating zoning regulations, encouraging more compact mixed-use development in their town centers, while leaving open and rural areas for agriculture, recreation and other suitable uses. More residential development in close proximity to town centers and schools increases accessibility by walking, bicycling or transit. It also boosts the vitality of downtowns as easier access supports increased patronage of downtown businesses. Stratham, Seabrook, Hampton Falls and Portsmouth have adopted form-based type zoning to achieve this result. Additional towns such as Newington have focused on access management to limit curb cuts from new development on state highways, and thus manage the impact of new development on road capacity and congestion.

CLIMATE CHANGE

New Hampshire coastal municipalities are confronted by a particularly challenging set of land use and hazard management concerns that include extreme weather events, storm surges, flooding, coastal erosion, and loss of key coastal habitats. These issues are exacerbated by changes in climate that result in an increase in the frequency and intensity of storms and an increasing rate of sea level rise. These effects are compounded by growth and development through increasing stormwater runoff and flooding. Sea level rise has the potential to displace coastal populations, threaten infrastructure, intensify coastal flooding and can ultimately lead to the loss of private property, public infrastructure, recreation areas, public space, and natural resources. Residential and commercial structures, roads, and bridges may be more prone to flooding over time as precipitation increases and storms become more frequent and severe. Sea level rise could reduce the effectiveness and integrity of existing seawalls and protective barriers, which have been designed for historically lower water levels. Climate-related changes projected for the Seacoast region (at right) are reported in *Climate Change in the Piscataqua/Great Bay Region: Past, Present, and Future* [Wake, 2011]

Climate Related Changes Projected for the Region

Sea Level Rise and Higher Coastal Storm Surge

Increased Precipitation During Extreme Events

Increased Winter and Summer Temperatures

Changes in Snow and Rainfall Patterns

Shifts in Flora and Fauna Ranges

[Wake, 2011]

Changes in New Hampshire's climate are well documented in local records of sea level, growing seasons, range of flora and fauna, precipitation and temperature. Similar to national trends and projections of current climate models, the state has experienced more extreme weather events including floods, drought and rising tides. Some degree of future impact will be influenced by changes to the atmosphere and warming of land, atmosphere and oceans already in progress. Longer term impacts will reflect decisions made today that influence how climate may change further into the future. Such decisions include energy choices such as fossil based versus renewable sources, land use and environmental protection, and transportation systems.

Sea-Level Rise

Under current conditions, sections of state roadways in the region, and their associated infrastructure, are vulnerable to frequent flooding from seasonal highest tides and coastal storm surge including NH Routes 1A, 1B, 1, 101 and 286. Since 1900, sea levels have risen an average of 0.7 inches per decade or a total of 8.5 inches in the seacoast region; however, the rate of sea level rise has increased to approximately 1/3 inches per decade since 1993 [NH coastal Risk and Hazards Commission, 2014].

Extreme Precipitation and Flooding

Under current conditions, sections of state roadways in the region, and their associated infrastructure, are vulnerable to frequent flooding from seasonal highest tides and coastal storm surge including NH Routes 1A, 1B, 1, 101 and 286. In recent years, coastal roadway flooding across NH's seacoast has been widely documented as part of annual "King Tide Photo Contest" sponsored by the NH Costal Adaptation Workgroup and the Piscataqua Region Estuaries Partnership: http://www.nhcaw.org/what/king-tide-contests/.

Figure 3-9 shows that the frequency and intensity of extreme precipitation events have substantially increased since the 1990's. As reported by the Federal Emergency Management Agency (FEMA), NH has had 34 major disaster declarations since 1953: 15 from 1953-1999 (a 46-year period), and 19 from 2000 to 2015 (15-year period) [FEMA, website].

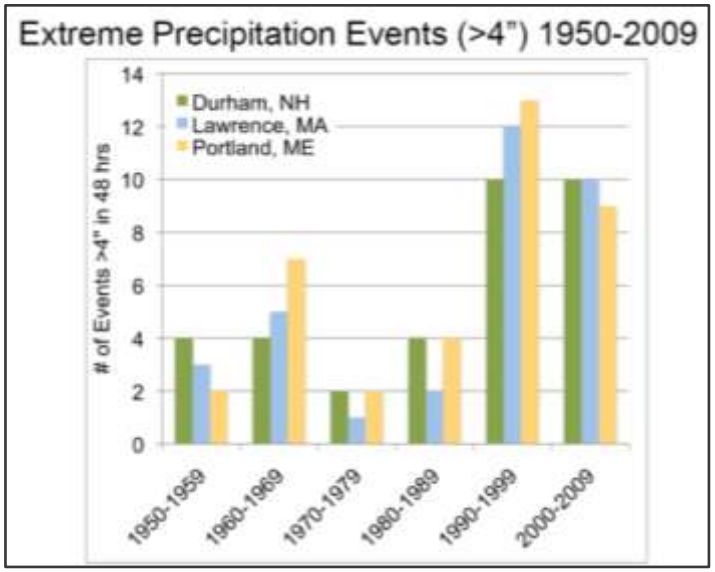


Figure 3-9 . *Total number of events with greater than four inches of precipitation in 48 hours per decade since 1950 (Wake et al, 2011).*

Established in 1983 and funded by National Oceanic and Atmospheric Administration, the Northeast Regional Climate Center (NRCC) is located in the Department of Earth and Atmospheric Sciences at Cornell University. The NRCC has published new extreme precipitation data for New Hampshire which shows for the southeast region of the state substantial increases in the amount of rain associated with large precipitation events (i.e. the 25-, 50-, and 100-year storms). The NRCC online database is available online at: http://precip.eas.cornell.edu/.

Figure 3-10. *Comparison of rainfall data for several locations around the region from Technical Review Paper No. 40 (TP40) Rainfall Frequency Atlas of the Eastern United States (1961) and the Atlas of Precipitation Extremes for the Northeastern United States by the Northeast Regional Climate Center (NRCC) (2013).*

Location	50-year storm Precip. (TP-40)	50-year storm Precip. (NRCC)	100-year storm Precip. (TP-40)	100-year storm Precip. (NRCC)
Portsmouth	5.8	7.39	6.5	8.85
Seabrook	5.8	7.64	6.5	9.19
Exeter	5.8	7.5	6.4	9.0
Epping	5.2	7.21	6.4	8.64
Sandown	5.7	7.10	6.4	8.52
Precipitation reported in inches				

Figure 3-10 reports a comparison of rainfall data from Technical Review Paper No. 40 (TP40) Rainfall Frequency Atlas of the Easter United States (the previous national atlas comprised of data collected prior to 1957) and the current Atlas of

Precipitation Extremes for the Northeastern United States published by the Northeast Regional Climate Center (2013).

The data sample from across the RPC region in Figure 3-10 shows an increase in rainfall amounts of 25-39 percent for the 50-year storm event and 35-49 percent for the 100-year storm event. Since the early 200's, freshwater flooding from extreme precipitation events have frequently impacted state roadways in the region including Routes 150, 108, 111, 111A, 88 and 27 as well as numerous local roadways, bridges, and culverts. This flooding is not unexpected given that these roads and supporting infrastructure were designed based on the TP-40 precipitation data making stormwater conveyance systems undersized for today's conditions.

In response to the publication of new precipitation data, the Department of Environmental Services incorporated NRCC's new precipitation atlas as part of its Alteration of Terrain permit program in 2014, requiring site development and stormwater management plans to design infrastructure to account for increased rainfall and runoff. Some municipalities in the region are using the NRCC data in the design and planning of road and stormwater infrastructure improvement projects.

Integration of Environment and Land Use

New Hampshire has good information from which to plan for climate change impacts but more research and analysis is needed to develop site and asset specific actions to build resilience into natural and man-made systems. Certainly, common sense practices such as incorporating new precipitation data and current sea-level rise projections into project planning and design are prudent short terms action. We know that stormwater runoff, the evolution of floodplains and changing shorelines can have negative impacts on transportation infrastructure and the environment. Investigating these interactions is a necessary step in understanding how these systems can be managed to sustain them into the future.

HOUSING

Cost of Ownership

Housing availability, diversity and affordability are important factors in creating and maintaining a favorable environment for creative, diverse, vibrant communities and healthy economic development. The quality of the housing stock in the region, as measured by common census statistics like age of units, number of bedrooms, utility status, etc., is generally good. Another positive metric for the state and region is the high homeownership rate, which correlates with overall prosperity. New Hampshire ranked second nationwide in homeownership with 71 percent of occupied housing units being owned versus rented (ACS 2012, 3 Year Data). In Rockingham County, 77 percent are owned, the highest of all areas in the state except Carroll County. On the other hand, the RPC region has comparatively high housing costs which can translate into higher living costs for the region's workforce, and in turn, high labor costs for the region's employers if higher wages are needed to attract the workforce their businesses.

Supply of Workforce Housing

Beginning in the 1970s and continuing to today, the region has had a relatively constrained supply of workforce-affordable housing, both owned and rental. At least two factors have and continue to contribute to this. First, the proximity to the Boston housing market and high housing costs in neighboring communities in Massachusetts tend to inflate the cost of housing here, whereas wages are not as strongly affected. Second, there is

an undersupply in multifamily housing - an important source of both rental and other affordable housing units in the region. Two additional factors contribute to this lack of multifamily housing: lack of municipal sewer and water services which permit development density conducive to multifamily development; and zoning provisions that discourage or make it infeasible. The Workforce Housing statute (RSA 674:58-674:61) requires municipalities to provide reasonable and realistic opportunities for the development of workforce housing by removing unnecessary barriers in zoning and land use regulations. Nevertheless legacy zoning provisions, combined with density limitations from lack of sewer, make such housing economically unattractive to developers in many parts of the region.

Lack of Affordable and Multi-Family Units

As of the 2010 Census, about two-thirds of the housing units in the region were single-family units, but for many small communities that number is over 80 percent. Zoning restrictions in many communities make it more difficult to construct affordable multi-family housing, but these restrictions are often in place because of the lack of municipal sewer and water infrastructure in the majority of the towns in the region. Only ten of the 26 RPC communities have municipal sewer systems, and in most of those, the sewer district covers only a small portion of the town. Even where allowed by zoning, that lack of infrastructure increases the relative cost of multifamily construction in rural areas and becomes less attractive to builders. Another factor in the comparatively small supply of multifamily housing presently available in the region is the relative weakness in the housing construction sector which began with the recession in the early to mid-1990s which affected the multi-family sector more than the single family sector.

TRANSPORTATION

The region is served by a well-developed roadway network, a small and geographically limited public transportation system, and a large variety of domestic and international freight transportation carriers. All modes of transport and goods movement are available within or near to the region including the Port of New Hampshire, Pan Am Railways main line (the former Eastern Line of the Boston and Maine Railroad) and the Pease and Manchester airports. Rail freight access has significantly declined over the past 50 year, while motor carrier freight access has dramatically increased.

STATE AND LOCAL ROADWAY NETWORK

In post-World War II New Hampshire the pattern of development has been defined almost solely by the extent of the roadway network. Since that time, emphasis has been placed on expansion of the capacity of the highway system, and this is reflected in the more than 1,800 miles of well-developed state, local, and private roads in the region. These roadways are organized in different classification schemes depending upon their urban or rural location, their role in providing mobility or access to property, and the volume and type of traffic that they are intended to serve, who they are maintained and owned by, or other attributes. Several of these classification schemes are used in New Hampshire.

Functional Classification

The roadway functional classification system is designed to provide consistency in how roadways are categorized based on how the facility serves varying transportation needs. This is couched in terms of how each facilitates accessibility and mobility for communities, the region, and the state while taking into account locational context and other livability factors (***Figure 3-11***). Accessibility refers to the ability to reach desired opportunities (property, goods, services, activities and destinations), while mobility refers to the actual physical movement between locations (Victoria Transport Policy Institute, 2014). All regional highways are shown on ***Map 3-1*** and discussed below, organized by classification from the most heavily used roadways to the least. While there is some overlap at the transition points, larger capacity roadways generally have the role of providing mobility between regions and have more restricted access while local roads have frequent direct access to individual properties but operate at much lower volumes and speeds.

Figure 3-11: Road Miles by Functional Class

More Mobility ↑ / More Accessibility ↓

Rural Roadways	Miles	Urban Roadways	Miles
Principal Arterials	1.8	Principal Arterials – Interstate	61.9
Minor Arterials	0.6	Principal Arterials – Other Freeways and Expressways	67.6
Major Collector	22.3	Principal Arterials –Other	54.6
Minor Collector	27.0	Minor Arterial	88.2
Local Road	240.3	Collector	150.3
Private Roads	245.9	Local Road	885.5
Sub-total	**537.9**	**Sub-total**	**1,308.1**

Total Road Miles = 1,846.2 miles

Legislative Classification

Another method of organizing roadways in New Hampshire is based on the ownership of the facility and who is responsible for maintenance. The New Hampshire Legislative Classification is required by RSA 229:5 and helps to define what roadways are eligible for different types of state aid. The breakdown of these types of roads within the region can be seen on ***Map 3-2***.

- ***Class I*** – Trunk line highways that consists of all highways on the primary state highway system except for those that are part of the urban compact. The state maintains full control over maintenance and construction activities.
- ***Class II*** – Highways on the state secondary highway system except for those within urban compacts. All improved sections of these roadways are maintained by the state.
- ***Class III*** – Recreational roads that access state parks and other reservations.
- ***Class IV*** – All roadways within the urban compact sections of certain communities. These roadways are maintained by the community even though some may be portions of numbered state highways. RSA 229:5 establishes which communities can have urban compacts.
- ***Class V*** – Rural roadways owned and maintained by communities.
- ***Class VI*** – Unmaintained highways owned by a community or the state.

NH Highway Tiers

More recently, the New Hampshire Department of Transportation has looked to group highways based around similarities such as connectivity to economic centers, regional significance, and maintenance requirements to manage the road network in a more

efficient and effective method. In that regard, the agency has established a six tiered system from highest to lowest priority roadways that combines aspects of both the functional and legislative classification systems. This classification scheme can be seen on ***Map 3-3***, the NHDOT website, and is generally defined as follows:

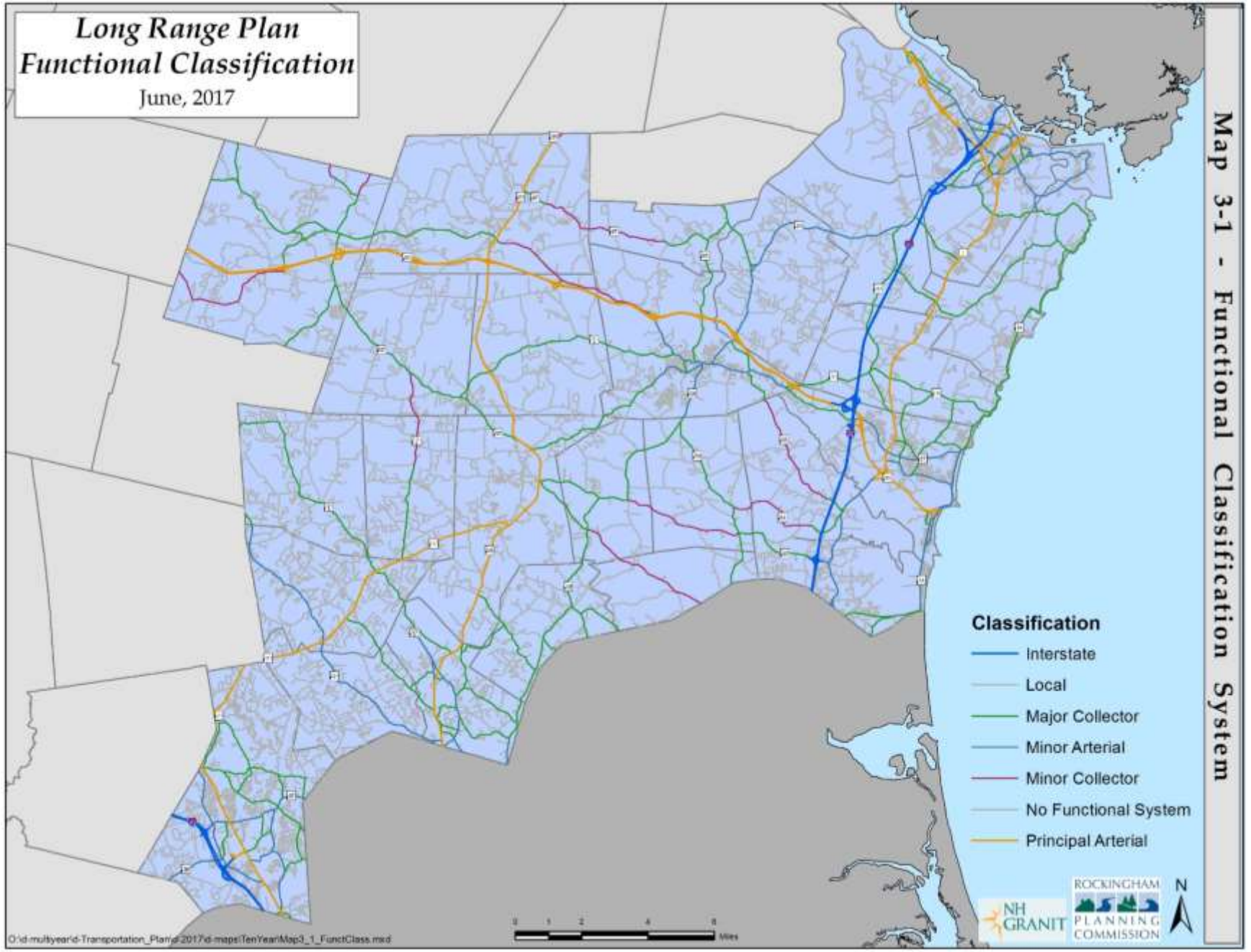
- ***Tier 1 – Interstates, Turnpikes, and Divided Highways*** that have high traffic volumes and carry the majority of commuter, tourist, and freight traffic around the state.
- ***Tier 2 – Statewide Corridors*** have moderate to high traffic volumes as they carry passengers and freight between regions of the state and to and from adjacent states. Some of these roadways are high speed while others are more rural roadways that have gained traffic as development has spread
- ***Tier 3 – Regional Transportation Corridors*** that provide travel with regions, access the statewide corridors and support moderate traffic volumes at moderate speeds.
- ***Tier 4 – Local Connectors*** are low volume and speed secondary highways and unnumbered state routes that act as local connectors and proved travel between communities.
- ***Tier 5 – Local Roads*** are community owned roads and bridges or state owned roads with urban compact limits that provide travel within communities. These facilities carry varying volumes of traffic at varying speeds.
- ***Tier 6 – Off Network*** are assets such as park and ride lots, rest stops, and maintenance facilities.

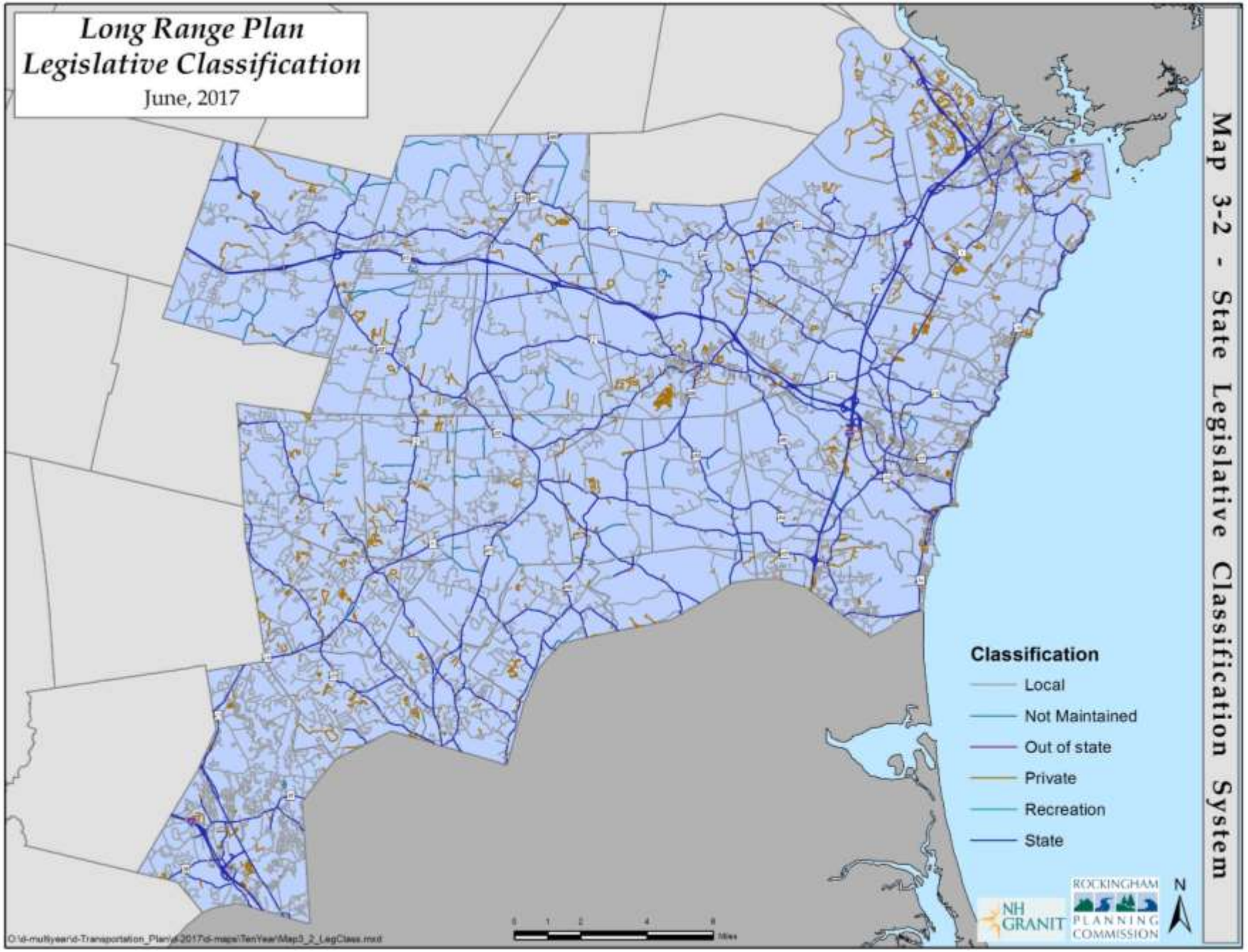
Congestion Management Network

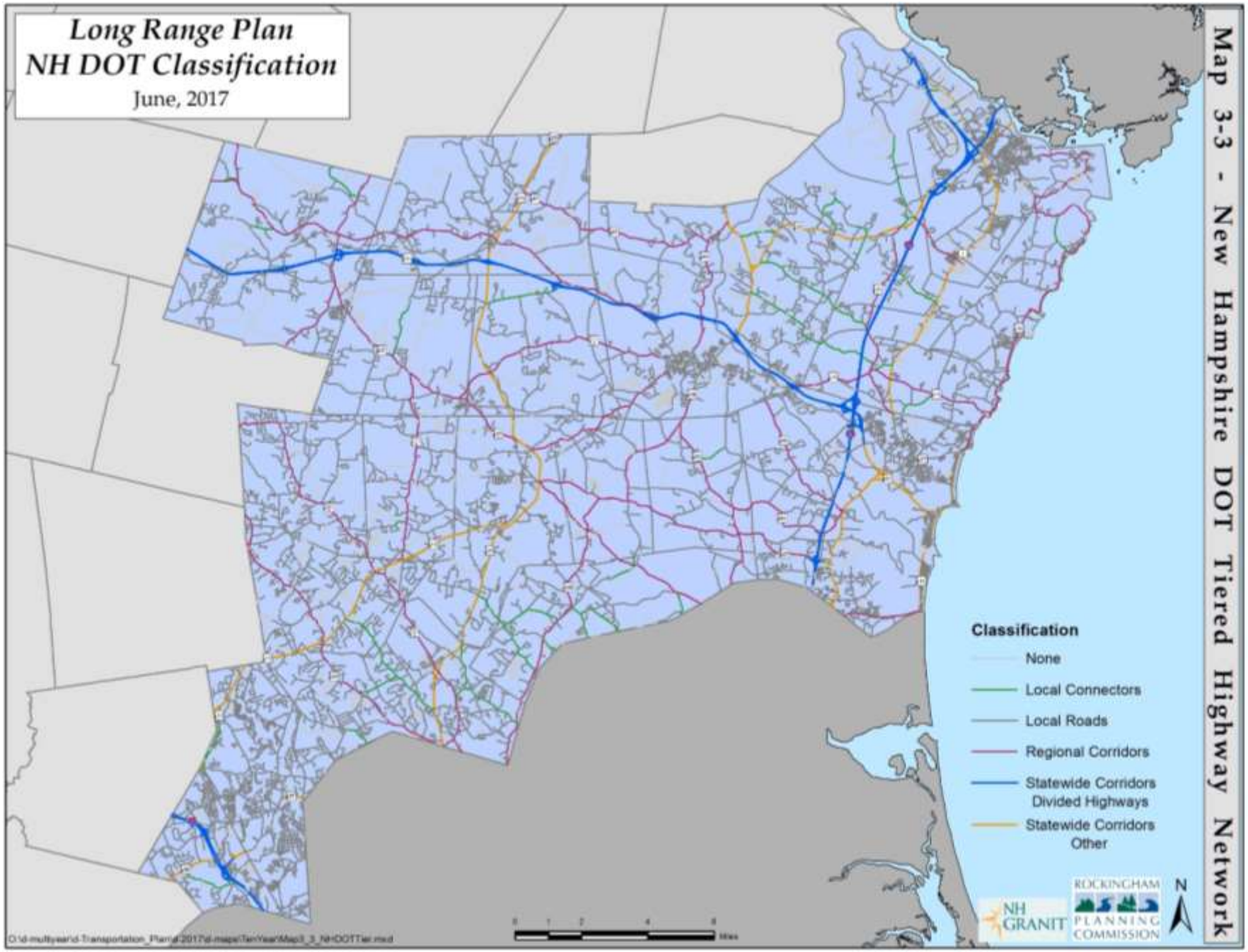
Federal law requires that metropolitan regions with more than 200,000 people, known as Transportation Management Areas (TMAs), maintain a Congestion Management Process (CMP) and use it to improve transportation planning and decision making. While the RPC region is not a TMA, the region includes 12 communities that are part of the Boston Urbanized Area and was required by FHWA NH Division to implement a CMP. As part of that process, the MPO defined the components of the transportation network that should be included and evaluated for congestion related impacts. This network is shown on ***Map 3-4*** and generally includes the primary arterials in the region along with routes serving the largest tourist destinations, regional and intercity transit services, and the park and ride facilities in the region.

National Highway System

The National Highway System (NHS) is a subset of roadways considered important nationally for economic, mobility, and defense purposes. Until 2012, this system consists of only interstate highways and other principal arterials, intermodal connectors that provide access between intermodal facilities (such as ports) and the rest of the NHS, and the Strategic Highway Network (SRAHNET) and related network connectors which include the access roads to major military installation and other highways designated to provide defense access, continuity, and emergency capabilities. With the passing of the MAP-21 legislation in 2012, the National Highway System was expanded by 230,000 miles nationally and now also includes all roadways classified as principal arterials. These roadways must comply with Federal design standards, contract administration requirements, oversight procedures, Highway Performance Monitoring System (HPMS) and National Bridge Inventory (NBI) reporting, data collection for national performance measures, and outdoor advertising and junkyard control in exchange for access to greater levels of Federal funding via the NHS subset of the funding provided to states for transportation improvements.


Long Range Plan
Functional Classification
June, 2017
Map 3-1 - Functional Classification System
Classification
Interstate
Local
Major Collector
Minor Arterial
Minor Collector
No Functional System
Principal Arterial
NH GRANIT
ROCKINGHAM PLANNING COMMISSION
N
Miles


Long Range Plan
Legislative Classification
June, 2017
Map 3-2 - State Legislative Classification System
Classification
Local
Not Maintained
Out of state
Private
Recreation
State
NH GRANIT
ROCKINGHAM PLANNING COMMISSION
N
0 1 2 4 8
Miles


Long Range Plan
NH DOT Classification
June, 2017
Map 3-3 - New Hampshire DOT Tiered Highway Network
Classification
None
Local Connectors
Local Roads
Regional Corridors
Statewide Corridors Divided Highways
Statewide Corridors Other
NH GRANIT
ROCKINGHAM PLANNING COMMISSION
N

The intent of this system is to encourage states and MPOs to focus federal aid improvement funds on a limited number of high-priority roadways within their bounds. The NHS roadways in this region are listed below and can be seen on ***Map 3-5***:

- Interstate 93
- Interstate 95
- NH 101
- NH 16(Spaulding Turnpike) and NH 101
- US 1 from the Hampton/Hampton Falls border to the US 1 Bypass and following the bypass to Maine.
- The connection from I-95 to the Portsmouth Transportation Center
- The connection from I-95 to the Port of New Hampshire.
- Route 103 in Maine connecting I-95 and US 1 Bypass to the Portsmouth Naval Shipyard is part of the STRAHNET.
- NH 125 (entire length)
- NH 111 from Kingston west to Nashua
- NH 28 from the Massachusetts border to Windham.

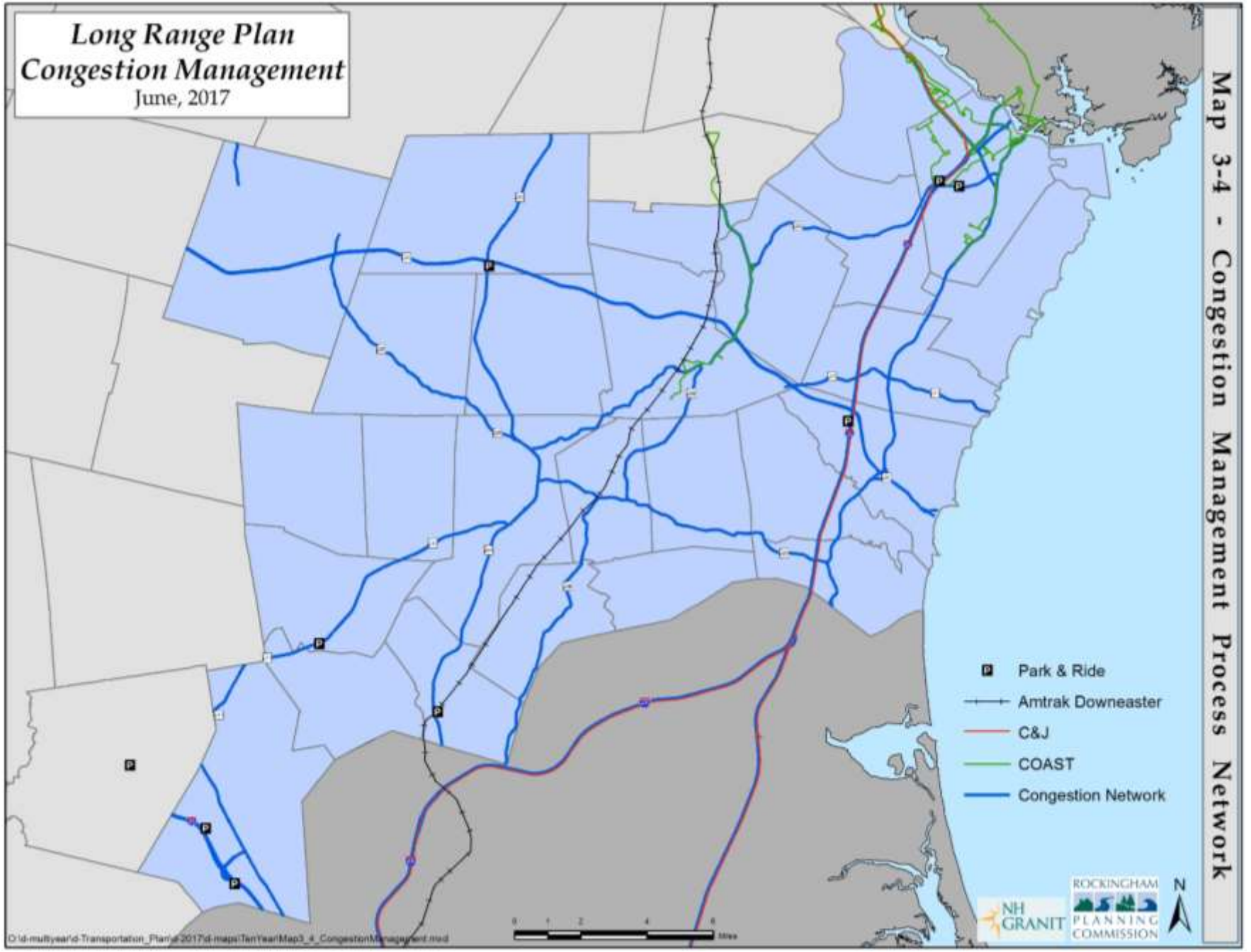
The movement towards Performance Based Planning has placed additional emphasis on NHS roadways in that a majority of the Federally mandated performance measures, particularly those related to pavement condition and congestion, apply separately or only to that subset of highways. There are ten measures that apply specifically to the NHS:

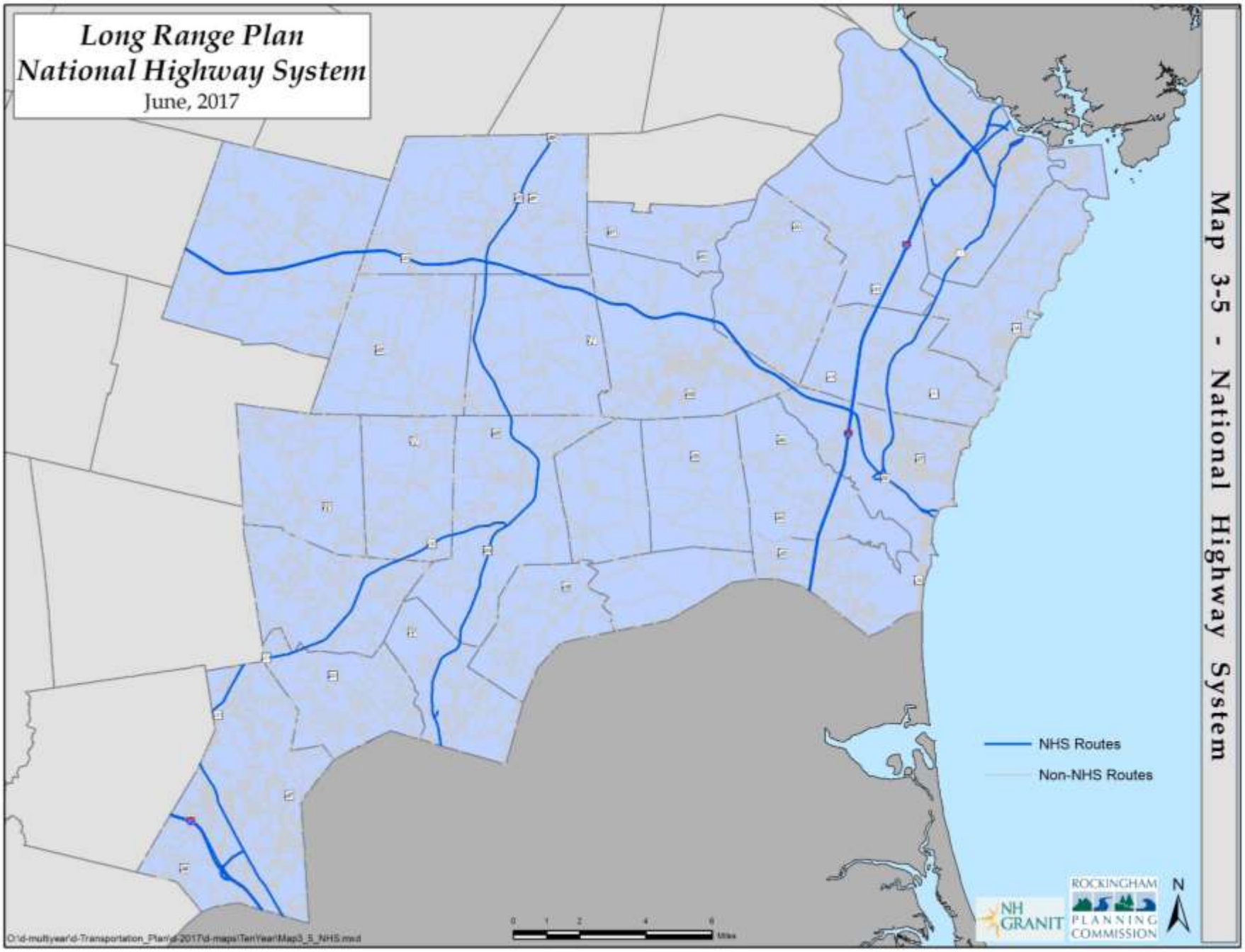
- Percent of NHS bridges by deck area in Good condition
- Percent of NH bridges by deck area in Poor condition
- Percent of Interstate pavements in Good condition
- Percent of Interstate pavements in Poor condition
- Percent of non-Interstate NHS pavements in Good condition
- Percent of non-Interstate NHS pavements in Poor condition
- A measure that will assess the percent of reliable person-miles traveled on the Interstate
- A measure that will assess the percent of reliable person-miles traveled on the non-Interstate NHS
- A measure that will assess freight movement on the Interstate by the percentage of Interstate system mileage providing for reliable truck travel time.
- Annual hours of peak hour excessive delay (PHED) per capita on the NHS.

These measures will be required to be implemented at the State level by October 1, 2018 and will be applied to the MPO 180 days after that. Performance Targets must be set for each of these measures and outcomes incorporated into a System Performance Report that will be integrated into the next regular update of the Long Range Transportation Plan. In this current iteration of the document, these metrics will be discussed and available data identified where possible in both this Existing Conditions chapter as well as the Current Trends and Future Conditions discussions.

VEHICLE MILES OF TRAVEL AND CONGESTION

From the 1970's until the 2004, the annual amount of vehicle miles of travel per person (per capita VMT) in the United States grew over 85% from 5,465 miles to 10,125 miles per year. This averages to an annual rate of about 1.8 percent per year (FHWA, 2014) that exceeded the 1 percent per year average annual growth in population over the same time period (US Census Bureau, 2014). Beginning around 2004, this pattern changed as the per capita VMT peaked and began to decline with the 9,447


Long Range Plan
Congestion Management
June, 2017
Map 3-4 - Congestion Management Process Network
Park & Ride
Amtrak Downeaster
C&J
COAST
Congestion Network
NH GRANIT
ROCKINGHAM PLANNING COMMISSION
N


Long Range Plan
National Highway System
June, 2017
Map 3-5 - National Highway System
NHS Routes
Non-NHS Routes
NH GRANIT
ROCKINGHAM PLANNING COMMISSION
N

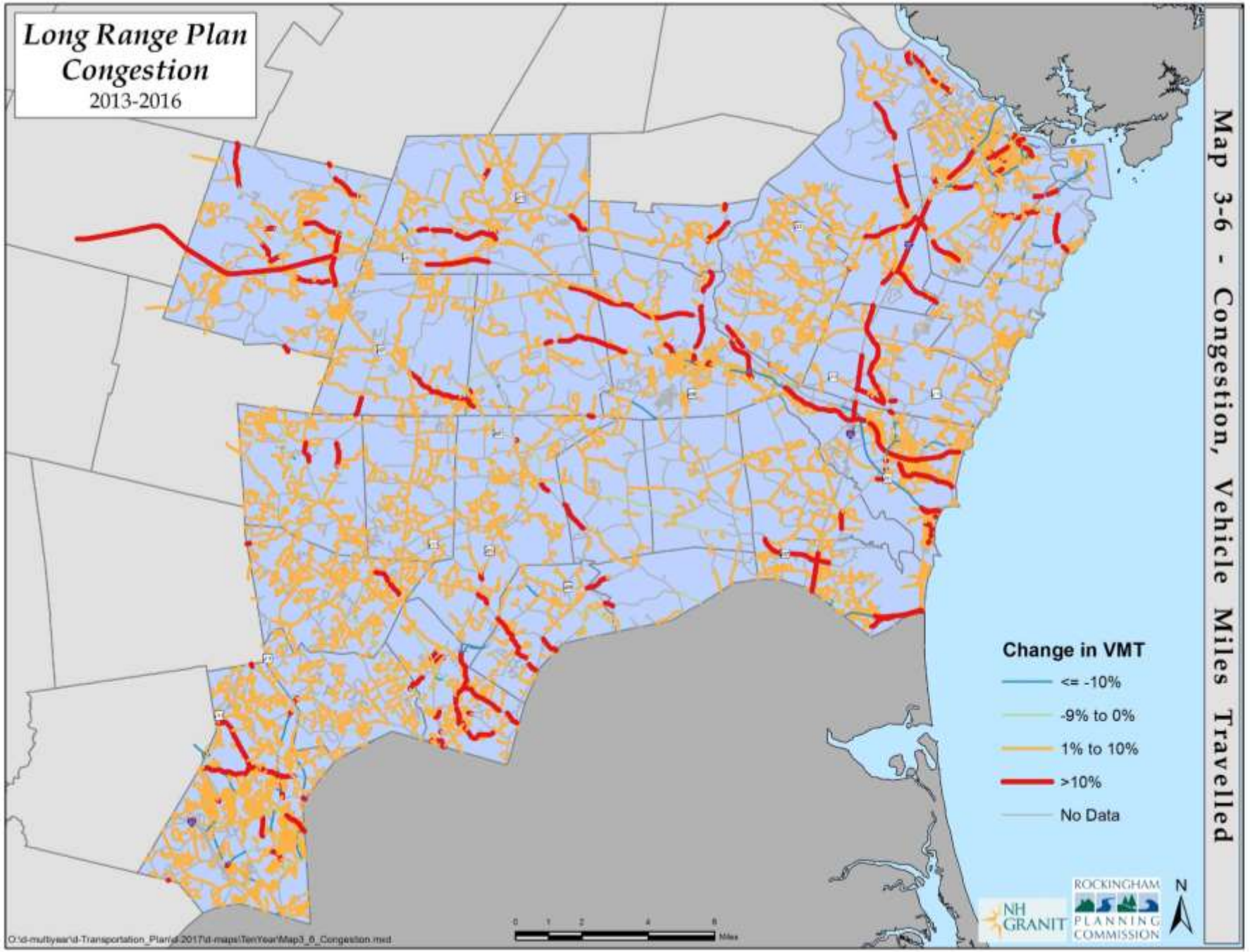
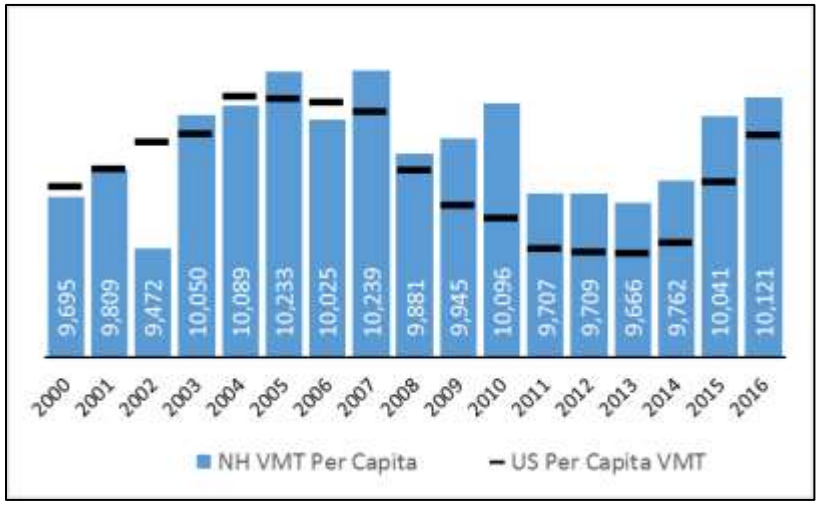

Long Range Plan
Congestion
2013-2016
Map 3-6 - Congestion, Vehicle Miles Travelled
Change in VMT
<= -10%
-9% to 0%
1% to 10%
>10%
No Data
NH GRANIT
ROCKINGHAM PLANNING COMMISSION
N
Miles

Figure 3-12: NH and US Per Capita VMT



miles per person seen in 2013 the lowest amount of travel since 1996. 2014 saw the first per capita VMT increase since 2003, and growth is continuing at a pace of about 1.3 percent per year. The national pattern of growth until the mid-2000s, followed by a decline and then renewed growth beginning in 2014 is reflected with some variation in the New Hampshire data as well (***Figure 3-12***). This trend is seen in the traffic count data as well with approximately 67 percent of count locations showing year over year declines in volumes between 2007 and 2013. This has important implications for future investment in the transportation network as current efforts are focused on expanding capacity to reduce congestion.

The economic downturn in the mid-2000's played a part in reducing individual vehicle travel in this country, although this trend started before that crisis and has continued into the economic rebound that occurred. This is generally attributed to fuel prices continuing to remain high at the time, lower car ownership among the Millennial generation, and the replacement of some trip making needs by technological improvements such as social networking, video conferencing, and improved access to information (Davis, 2012). The resumed growth of VMT over the last few years is attributed to increased employment and economic activity as well as substantially lower gas prices that has increased discretionary income for many households, and in turn allowed for increased travel (Polzin, 2016).

COMMUTER FLOWS

Data on where people live and work provide valuable insight for assessing transportation. Of the 94,960 workers aged 16 and over that the American Community Survey estimated to live in the MPO region in 2014, approximately 41 percent worked within the MPO region, while 59 percent of residents worked outside the region. ***Figures 3-13*** and ***3-14*** show workplace by county for MPO region

Figure 3-13
Workplace by County for Workers in MPO Region

	2000	2000	2014	2014
Rockingham	54,277	57.2%	42,779	45.0%
Essex, MA	17,232	18.2%	14,261	15.0%
Hillsborough	4,493	4.7%	10,305	10.9%
Middlesex, MA	8,783	9.3%	8,516	9.0%
Strafford	2,641	2.8%	4,968	5.2%
Suffolk, MA	2,840	3.0%	3,302	3.5%
Merrimack	970	1.0%	2,968	3.1%
York, ME	1,106	1.2%	984	1.0%
Other	2,545	2.7%	6,877	7.2%
Total	**94,887**	**100%**	**94960**	**100%**

Source: ACS 2010-2014, Census 2000

Figure 3-14 – Commute destination by county for MPO region residents

commuting patterns. Residents of the region employed in Rockingham County dropped significantly, as did commutes to Essex County. Conversely, commutes to Hillsborough, Strafford and Merrimack Counties roughly doubled. Growth in commutes to Hillsborough and Merrimack Counties have likely been influenced by improvements to NH101 completed in the late 1990s, while growth in commutes to Strafford County likely reflects overall employment growth in that county.

residents. After Rockingham County, the next largest concentration of employment was in Essex County, MA at 15 percent, Hillsborough County at 10.9 percent, Middlesex County, MA at 9 percent and Strafford County at 5.2 percent. Compared to the 2000 Census commuter flow data shown in ***Figure 3-15*** these numbers show some notable shifts in

Looking at workers employed in the MPO region live, approximately 38% live in the MPO region, while 62% live outside the MPO region. Top origination counties for commuters to the MPO region include Rockingham County at 47 percent, Strafford County at 13.7 percent, Hillsborough County at 10.5 percent and Essex County, MA at 8.1 percent. As with commutes by MPO region residents, these numbers also show significant changes since 2000. Commuters from Strafford County dropped slightly and commuters from all of Rockingham County dropped significantly from 61 percent of workers employed in the MPO region to only 48 percent. Commuters from Hillsborough County more than doubled, while commuters from Merrimack County more than tripled. Notably commuters from Other counties beyond southern New Hampshire southern Maine and northern Massachusetts more than tripled as well. A partial explanation for this, borne out by mode share data in ***Figure 3-15***, is the expansion of telecommuting, reducing the importance of proximity between home and work.

Figure 3-15: Commuter Mode Share 2000-2015

Mode of Travel to Work	NH 2000	NH 2015	Rock County 2000	Rock County 2015	Exeter 2000	Exeter 2015	Ports-mouth 2000	Ports-mouth 2015
Car, truck, or van - drove alone	81.8%	81.1%	84.8%	84.1%	78.2%	79.7%	80.5%	74.9%
Car, truck, or van - carpooled	9.8%	8.0%	7.8%	6.2%	9.9%	5.6%	6.4%	7.6%
Public transportation	0.6%	0.8%	0.7%	0.9%	0.8%	0.6%	1.4%	1.4%
Walked	2.9%	2.9%	1.7%	1.7%	4.6%	6.5%	4.9%	5.5%
Bicycled	0.2%	0.2%	0.1%	0.3%	0.5%	1.5%	0.3%	0.9%
Worked at home	4.0%	6.0%	4.1%	6.2%	5.2%	5.7%	5.4%	9.2%

Source: ACS 2011-2015, Census 2000

TRAFFIC SAFETY

Crash data from the NH Crash Records Database is available for the region covering the years from 2002-2015. Other than the fatal crashes where there is a federal crash database (Fatality Analysis Reporting System, or FARS) to corroborate the information, there are substantial issues with the accuracy and consistency of that dataset, and so rates and totals presented should be considered general estimates. To identify patterns and rates, five-year averages are generally utilized as they account for the variability from year to year in the number and severity of crashes. Given the data available, ten five-year periods were utilized to understand any patterns in the region beginning with the 2002-2006 and ending with the 2011-2015 five-year period. In general, there has been a decrease in the average number of total crashes (***Figure 3-16***) and crash rates per 100 Million Vehicle Miles of Travel (VMT) (***Figure 3-17***) between the 2002-2006 and 2011-2015 five-year periods. That being said, both saw lowest values during the 2009-2013 period and have started to increase again.

Figure 3-16: Five Year Average Numbers of Crashes

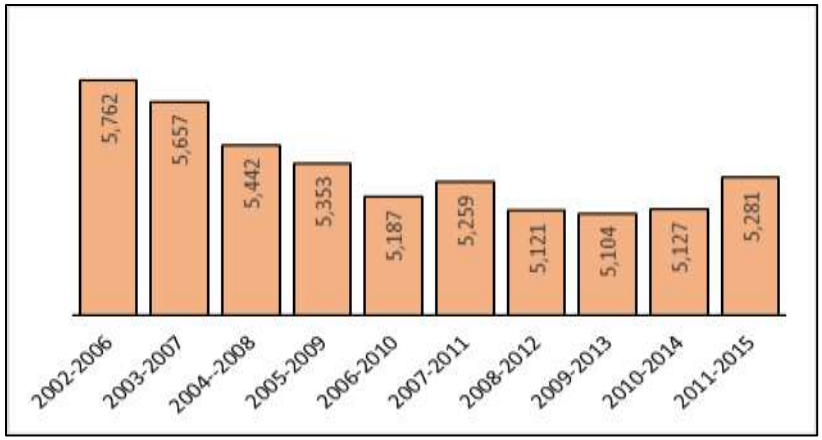
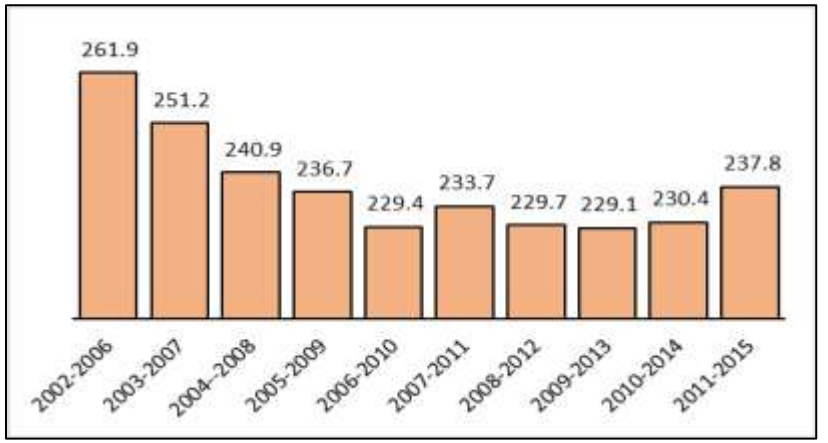


Figure 3-17: 5-Year Average Crash Rate per 100 Million VMT



Traffic safety is a primary focus of the National Performance Goals and that has been translated by the Federal Highway Administration into five performance measures that the MPO will be implementing utilizing crash data from National Highway Traffic Safety Administration (NHTSA), the New Hampshire Department of Safety (DOS) and traffic volume data collected by the MPO and NHDOT as part of the Highway Performance Monitoring System (HPMS):

- Number of fatalities
- Rate of fatalities per 100 Million Vehicle Miles of Travel (VMT)
- Number of serious injuries
- Rate of serious injuries per 100 Million VMT
- Non-motorized fatalities and serious injuries

It is anticipated that the Federal Transit Administration will be developing transit related safety measures that the MPO will need to implement as well, but these have not been finalized at this time. Further, the MPO worked with the other New Hampshire MPOs, NHDOT, FHWA, FTA, and NHDES to develop a set of supplemental performance measures including one that is safety related: the number of Motorcycle Fatalities. Each of these measures will be discussed as part of the remainder of this section.

Fatalities and Injuries

The number of traffic fatalities each year is inconsistent, which is not surprising given the randomness of traffic deaths. There were 217 traffic deaths in the region between 2002 and 2015, an average of 16 per year, with annual values between 11 deaths (2011) and 22 (2007). For this reason, five-year moving averages are calculated to normalize the crash data over a longer time period in order to account for anomalies that can skew the analysis. Examining the five year averages shown in ***Figure 3-18***, it can be seen that there has been about an 11% increase in the number of deaths from an average of 14.2 in 2002-2006 to 15.8 in the 2011-2015 five year period (top graphic). The rate of fatalities per 100 Million VMT has shown a similar amount of variance, also increasing by 11% between the 2002-2006 and 2011-2015 five-year periods (bottom graphic). There has been consistent improvement in the number and rate of serious injuries occurring as the result of motor vehicle related crashes. From the 2002-2006 period to the 2011-2015 period the five-year average number of serious injuries has decreased from 96 to 62.6 and at the same time, the rate has dropped substantially from 4.37 per 100 Million VMT to 2.82 per 100 Million VMT (***Figure 3-18***), both of which are decreases of approximately 35%. At least some of the reduction in the rate and number of serious injuries is related to an increased use of safety equipment. In 2002, about 70% of the individuals involved in a motor vehicle crash were utilizing the installed restraints. By 2009 this had increased to 90% of individuals, and in 2015 stands at just under 92%.

Figure 3-18: 5-Year Average Fatalities (top) and Average Fatality Rate per 100 Million VMT (bottom)

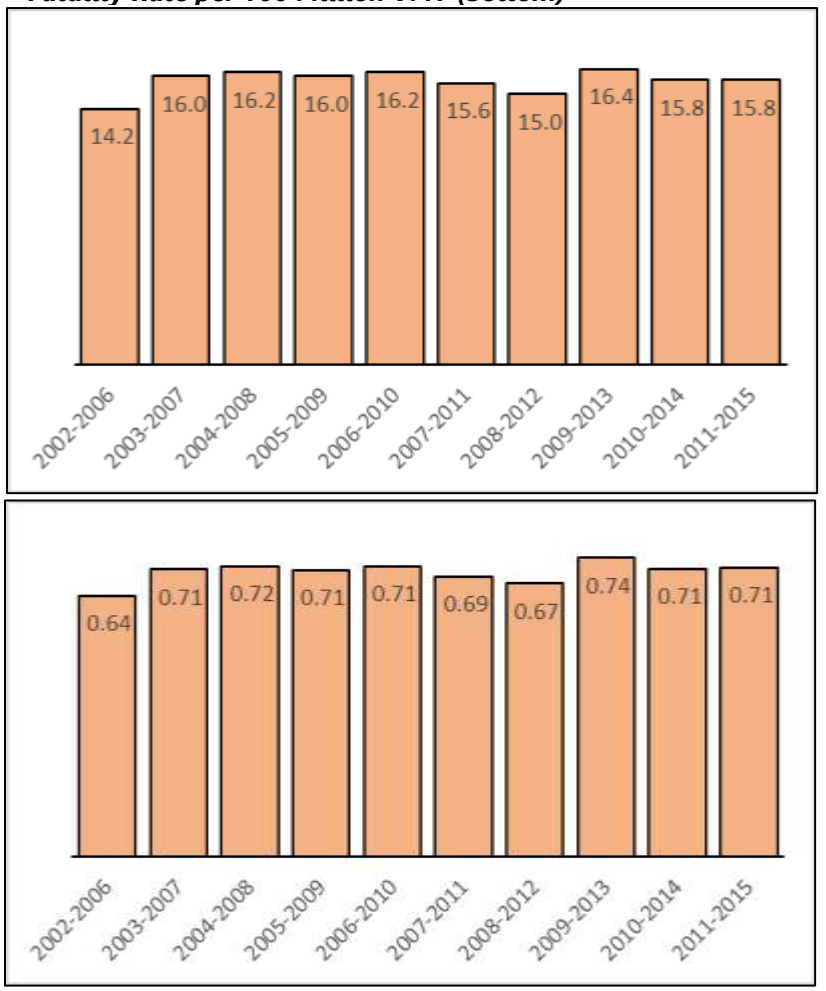
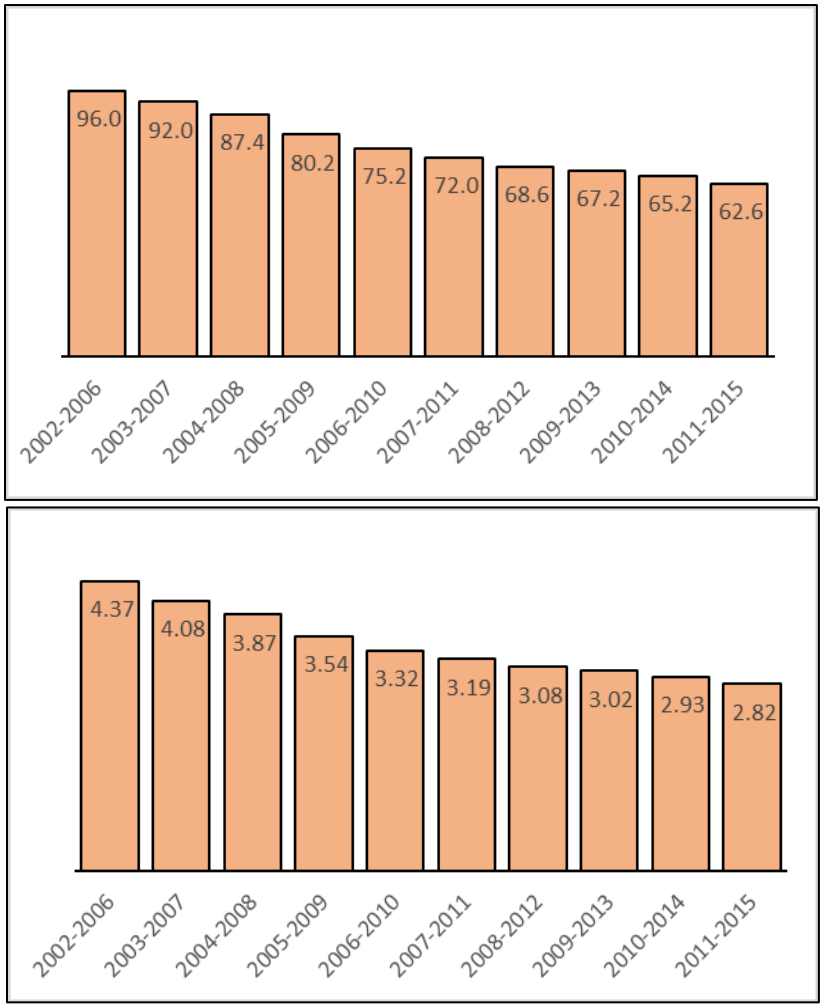


Figure 3-19: 5-Year Average Serious Injuries (top) and Serious Injury Rate per 100 Million VMT (bottom)



Correspondingly, the distribution of injury severity has shifted as well. In 2003, nearly 39% of individuals in a crash received some sort of injury with over 3% incapacitated or killed. By 2015, about 8.4% receive some sort of injury and less than 1% are incapacitated or killed (***Figure 3-20***).

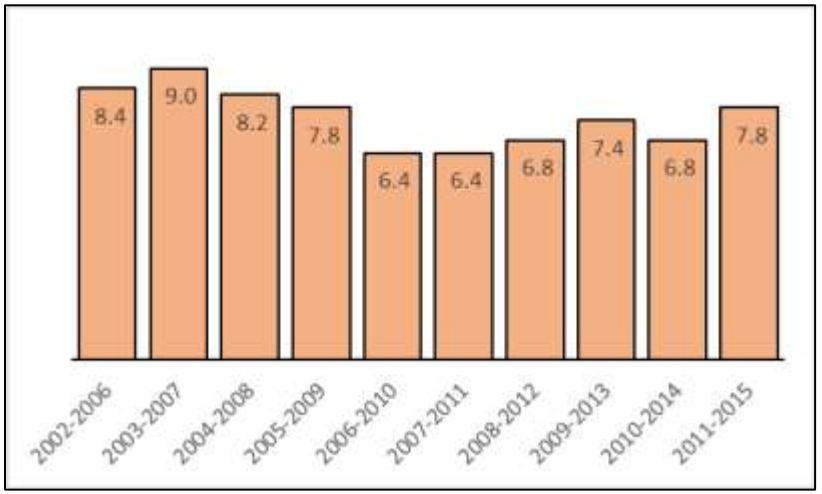
Non-Motorized Fatalities & Serious Injuries

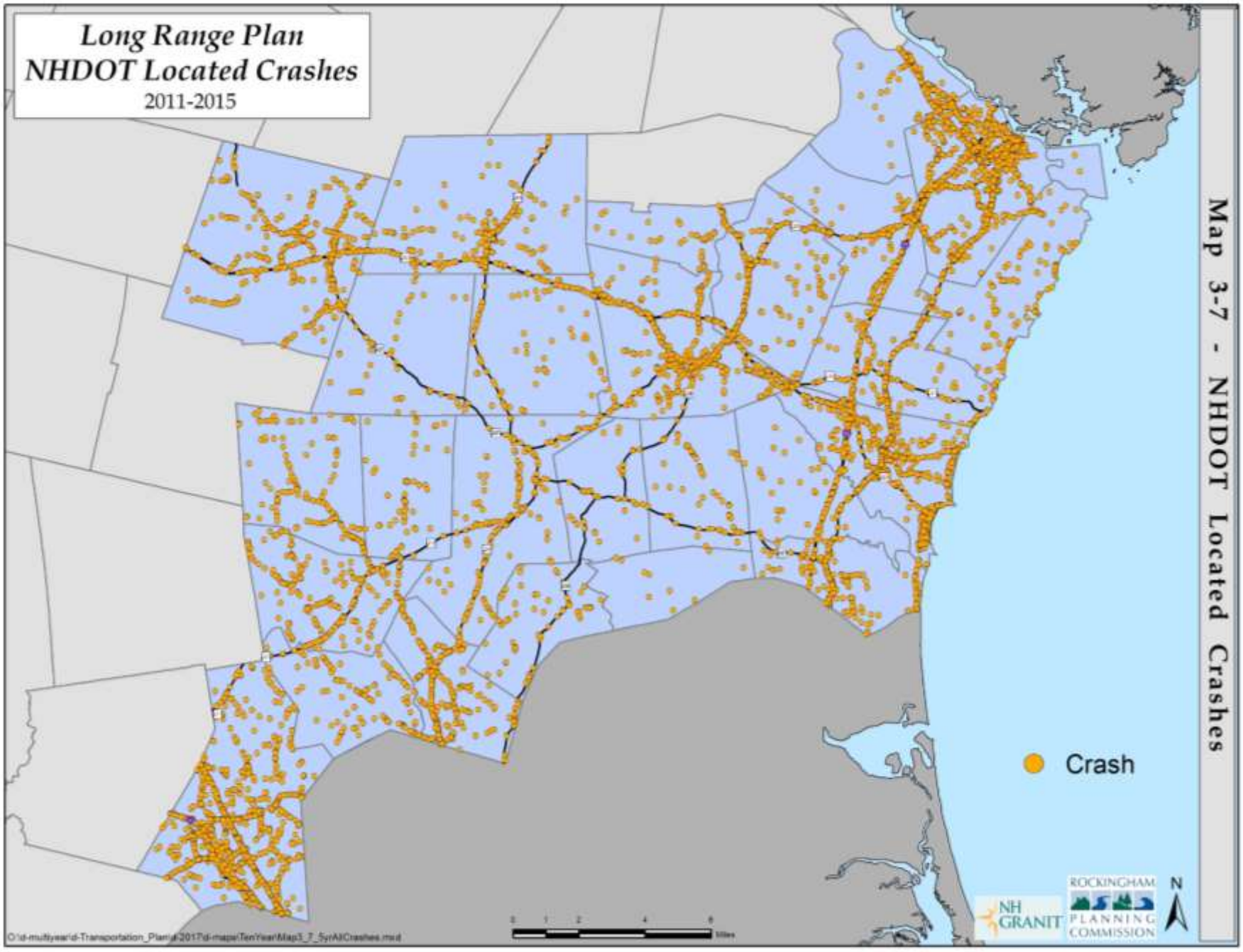
Figure 3-20: Change in Distribution of Injury Types 2003–2015

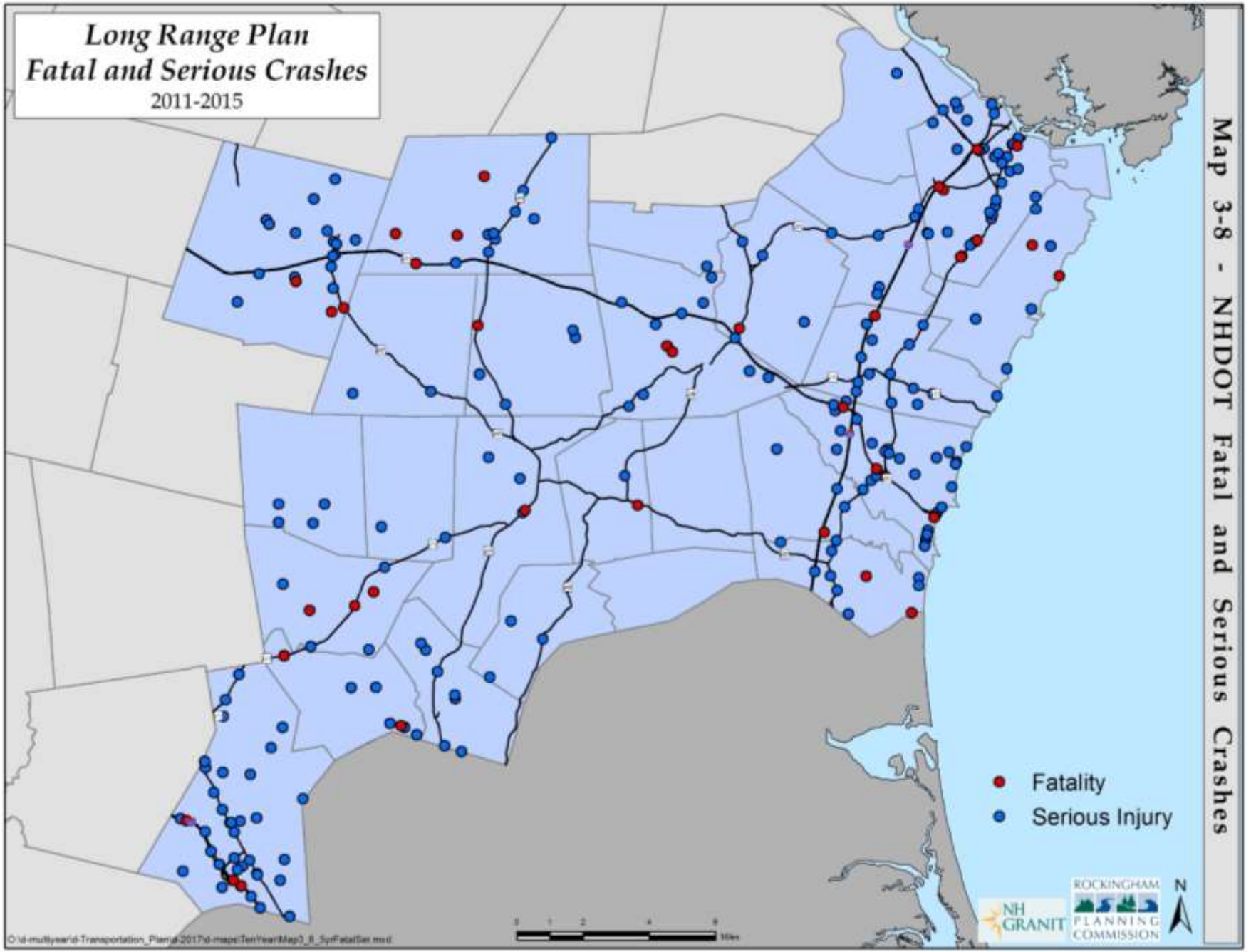
	2003	2015
Killed	0.31%	0.13%
Incapacitating Injury	2.87%	0.54%
Non-Incapacitating Injury	22.08%	5.18%
Possible Injury	13.36%	2.53%
No Apparent Injury	49.53%	82.66%
Unknown	11.85%	8.96%
Total Injuries	3,899	13,176

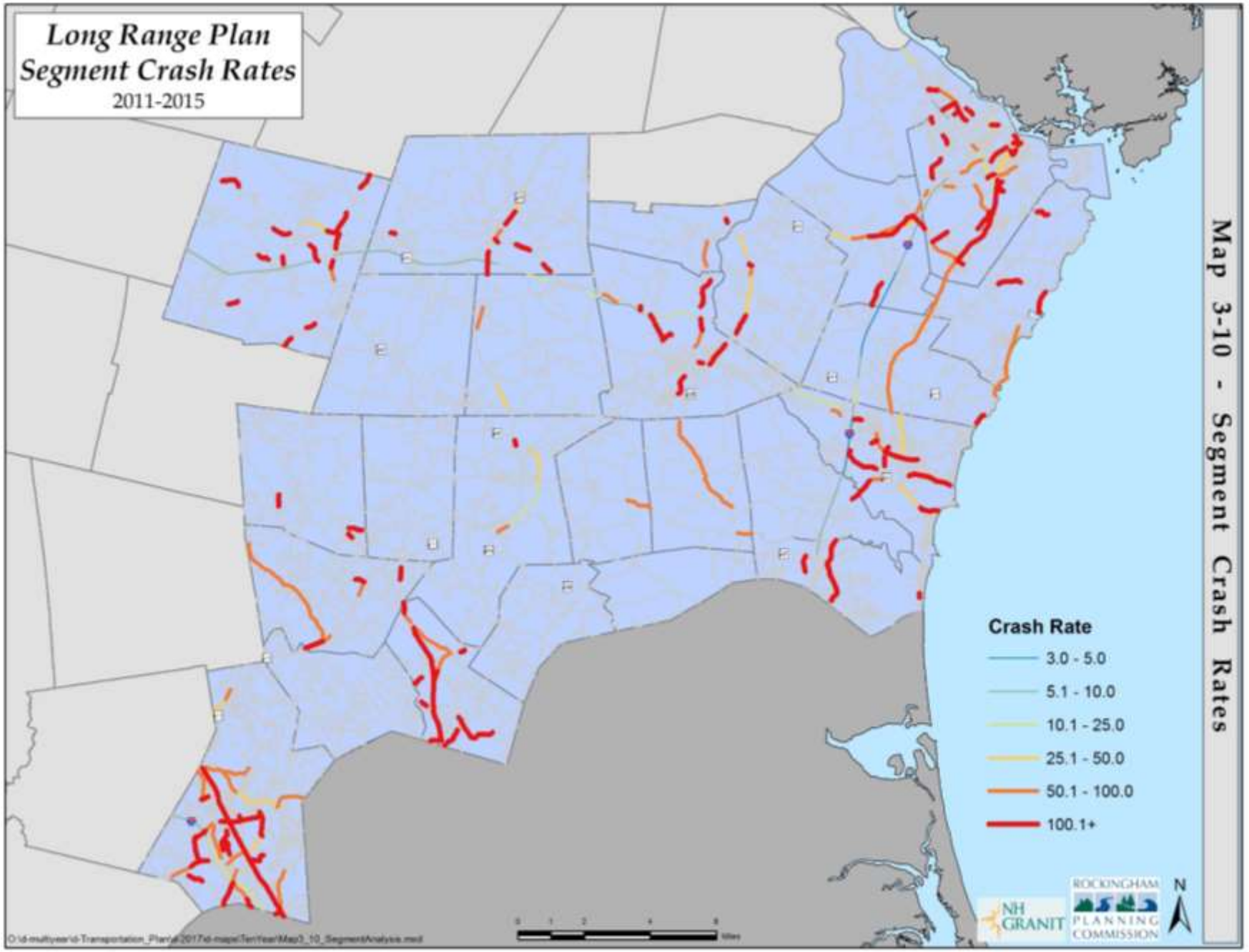
Non-motorized crashes are those that involve a bicyclist or pedestrian and given the small number of these crashes each year, fatalities and serious injuries to these roadway users are considered together. Looking at the five-year average non-motorized fatalities and serious injuries shows an overall 7% decrease between the 2002-2006 period and the most recent five years.

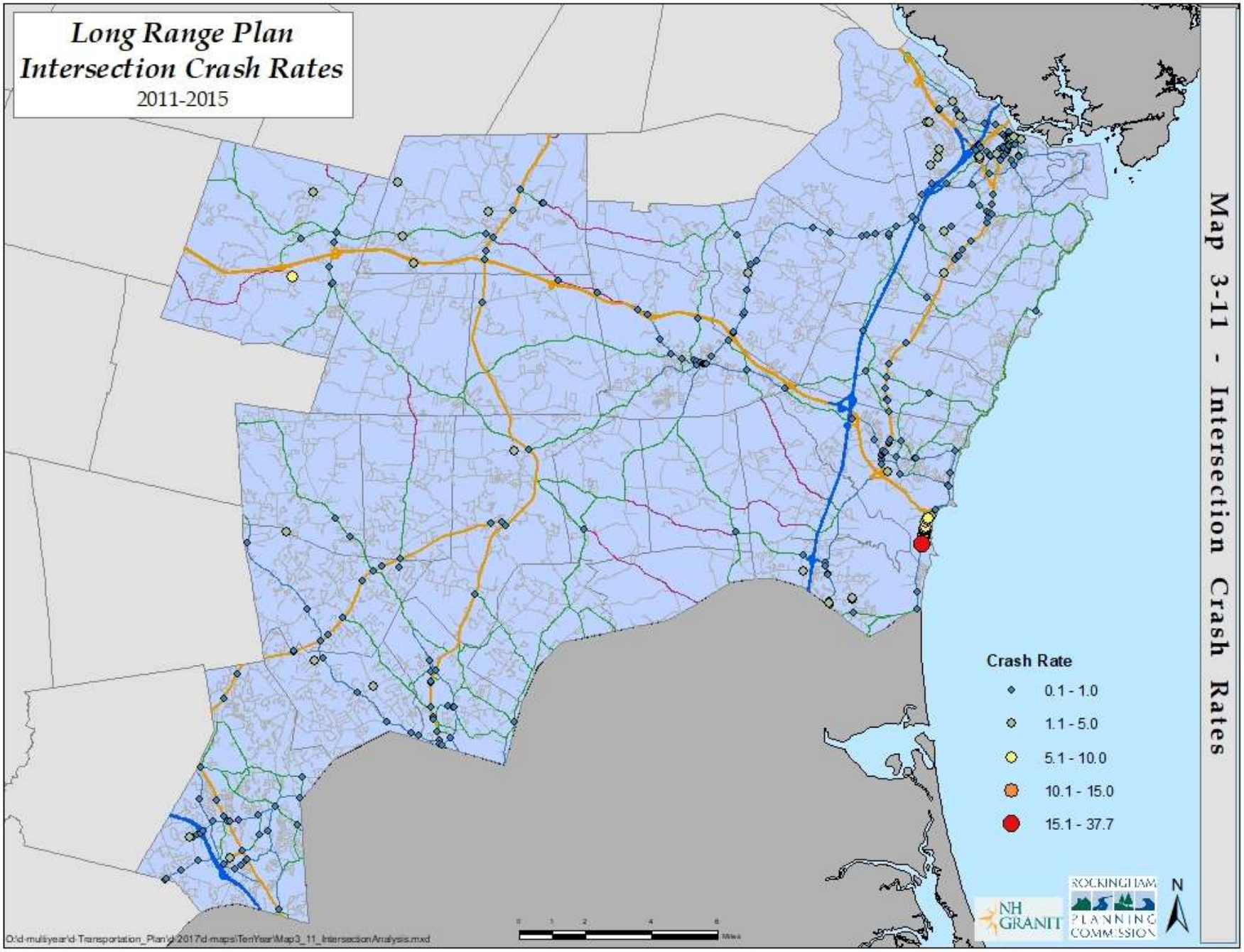
Figure 3-21: Five Year Average Non-Motorized Fatalities and Serious Injuries




Long Range Plan
NHDOT Located Crashes
2011-2015
Crash
Map 3-7 - NHDOT Located Crashes
ROCKINGHAM PLANNING COMMISSION
NH GRANIT
N


Long Range Plan
Fatal and Serious Crashes
2011-2015
Fatality
Serious Injury
NH GRANIT
ROCKINGHAM PLANNING COMMISSION
N
Map 3-8 - NHDOT Fatal and Serious Crashes


Long Range Plan
Segment Crash Rates
2011-2015
Crash Rate
3.0 - 5.0
5.1 - 10.0
10.1 - 25.0
25.1 - 50.0
50.1 - 100.0
100.1+
NH GRANIT
ROCKINGHAM PLANNING COMMISSION
N
Map 3-10 - Segment Crash Rates


Long Range Plan
Intersection Crash Rates
2011-2015
Map 3-11 - Intersection Crash Rates
Crash Rate
0.1 - 1.0
1.1 - 5.0
5.1 - 10.0
10.1 - 15.0
15.1 - 37.7
N
NH GRANIT
ROCKINGHAM PLANNING COMMISSION
O:\d-multiyear\d-Transportation_Plan\d-2017\d-maps\TenYear\Map3_11_IntersectionAnalysis.mxd

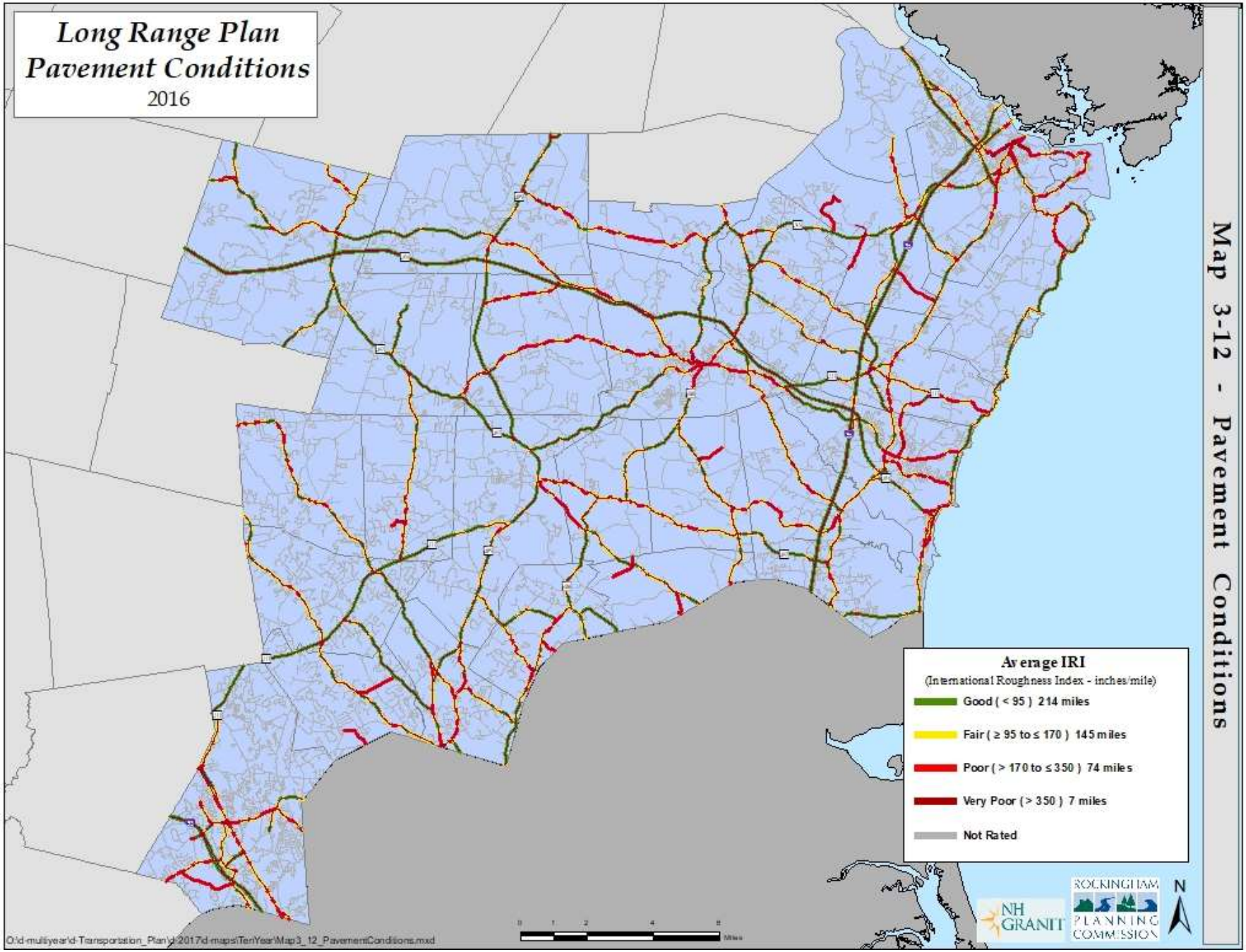
PAVEMENT CONDITIONS

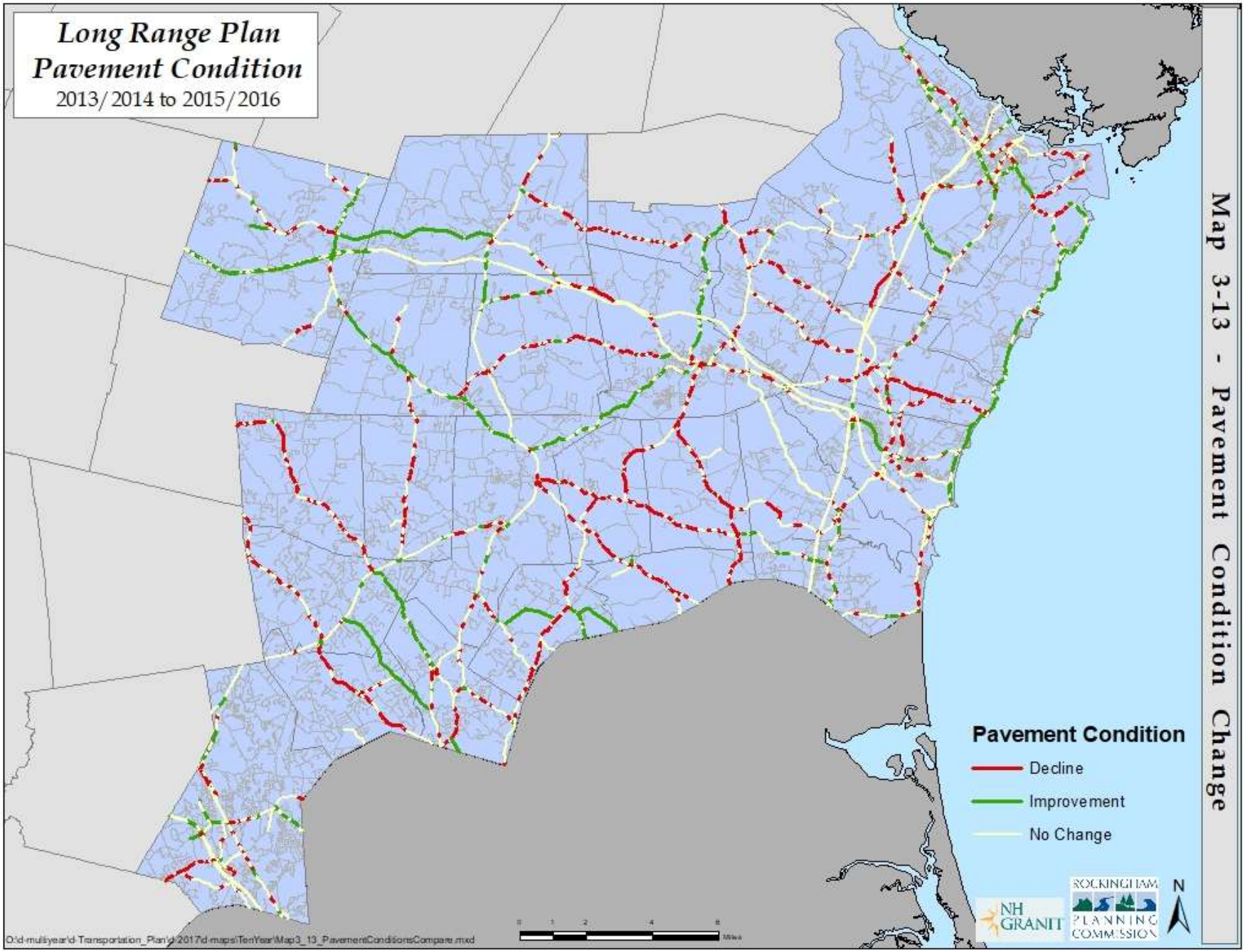
NHDOT monitors state owned highways by collecting roadway surface conditions on a biennial basis and uses the data to implement its Pavement Management Strategy. As of 2016, approximately 49% of the state owned roadway mileage in the region is considered to be in "Good" condition while only 19% is in "Poor" or "Very Poor" condition. This is largely due to the application of the NHDOT's current pavement strategy over the last four years and an infusion of additional state and federal funding dedicated to maintenance activities. Much of the focus has been on addressing roadways on the National Highway System (NHS) which tend to be the heaviest traveled facilities, and as of 2016 81% of that mileage is considered to be in "Good" condition, while only 32% of the non-NHS mileage in the region is considered to be in "Good" condition. These represent substantial improvements, but indicate a growing gap between roads on and off the NHS.

BRIDGE CONDITIONS

Increased awareness of the dangers of structural deficiencies in the wake of high-profile bridge failures in other parts of the United States has accelerated work on many bridges in the area including the Memorial (replaced in 2013) and the Sarah Mildred Long Bridges (Anticipated to open October, 2017) over the Piscataqua River between Portsmouth and Kittery. As of April, 2017, there are 151 state-owned and 324 municipally-owned bridges listed as "Red Listed" indicating structural or functional obsolescence. The RPC region hosts 31 of these structures that need to be rehabilitated or replaced and basic information about these bridges can be found in the appendix of this chapter. ***Figure 3-19*** shows the challenge that the state and communities face in addressing the bridge replacement and rehabilitation needs of the state. Since 2000, the state has averaged adding 18 state bridges each year to the list of those in need of repair while removing 17.6. If this timeframe is narrowed to the last five years, 22 have been added on average while only 20 have been removed, which indicates that bridges are deteriorating into poor condition faster than they can be repaired given existing resources. This points to the increasing complexity and cost of these projects and while some very large projects are currently being addressed (Sarah Long Bridge for instance), resources do not allow for continued strong progress in reducing the number of structurally and functionally deficient bridges in the state and the region. On the municipal side, an average of 21.4 bridges have been added to the Red List each year while 27.5 have been removed, and so greater progress is being made in reducing the number of structurally deficient bridges. These municipal bridges are often smaller structures on lower volume roads that are rehabilitated rather than replaced. This enables them to be addressed more quickly, and at substantially lower cost.

There are currently 31 red list bridges in the RPC region, down from 41 in 2014. 18 of these are state owned bridges while 13 are municipally owned. Of the state bridges, two are currently in construction, four more are in the TIP to be addressed in the next few years, and two additional are in the planning stages.


Long Range Plan
Pavement Conditions
2016
Map 3-12 - Pavement Conditions
Average IRI
(International Roughness Index - inches/mile)
Good (< 95) 214 miles
Fair (≥ 95 to ≤ 170) 145 miles
Poor (> 170 to ≤ 350) 74 miles
Very Poor (> 350) 7 miles
Not Rated
N
NH GRANIT
ROCKINGHAM PLANNING COMMISSION
O:\d-multiyear\d-Transportation_Plan\d-2017d-maps\TenYear\Map3_12_PavementConditions.mxd


Long Range Plan
Pavement Condition
2013/2014 to 2015/2016
Map 3-13 - Pavement Condition Change
Pavement Condition
Decline
Improvement
No Change
NH GRANIT
ROCKINGHAM PLANNING COMMISSION
N
O:\d-multiyear\d-Transportation_Plan\d-2017d-maps\TenYear\Map3_13_PavementConditionsCompare.mxd

FREIGHT TRANSPORTATION

The Rockingham Planning Commission area is well served by a broad range of domestic and international freight transportation carriers and all modes of goods movement are available within or near to the region. In addition to the major highways, the region is home to the Port of New Hampshire, Pan Am Railways main line (the former Eastern Line of the Boston and Maine Railroad), the Pease Airport, and a natural gas pipeline.

Figure 3-22: NH State & Municipal Red List Bridge Totals

State Red List Bridges				Municipal Red List Bridges		
Year	Start Total	End Total	Net Change	Start Total	End Total	Net Change
2000	144	157	13			
2001	157	168	11			
2002	168	167	-1			
2003	167	153	-14			
2004	153	146	-7	397	373	-24
2005	146	140	-6	373	365	-8
2006	140	137	-3	364	363	-1
2007	137	137	0	363	370	7
2008	137	139	2	370	358	-12
2009	139	142	3	358	366	8
2010	142	148	6	366	359	-7
2011	148	140	-8	359	353	-6
2012	140	145	5	353	352	-1
2013	145	147	2	352	344	-8
2014	147	153	6	351	344	-7
2015	153	154	1	344	338	-6
2016	154	151	-3	338	324	-14

Shipping

The region is host to the Port of New Hampshire in Portsmouth, an active port handling over 8.8 million tons of cargo each year and expected to nearly double that by 2040 (USDOT). The Division of Ports and Harbors (DPH) Market Street Marine Terminal, located on the Piscataqua River, is the only public access, general cargo terminal on the River. The Piscataqua is a year-round, ice-free, deep draft river. The Market Street Terminal has 8 acres of paved outside lay down area, 50,000 square feet of covered warehouse space, onsite rail access, and is close to the regional highway network (1/2 mile from Interstate 95). The terminal can handle bulk cargo such as scrap metal, salt and wood chips, break bulk such as industrial machinery parts and construction materials, project cargo such as power plant components and vacuum tanks, as well as container cargo. In addition, Portsmouth is within 50 miles of the Port of Boston, one of America's major port facilities, and has convenient access by highway and rail to other major and regional ports including New York, Portland, and Montreal.

Port of New Hampshire, 2003 Source: RPC

Rail

The area is served by the main line of Pan Am Railways, a major U.S. regional railroad, which was historically known as the Boston and Maine Railroad (B&M) Main Line West running between Boston and Portland, and in the RPC region traversing the towns of Atkinson, Plaistow, Newton, Kingston, East Kingston, Exeter, and Newfields. The mainline is currently categorized as a Class 4

track which allows passenger rail speeds up to 80 MPH and freight rail speeds of up to 60 MPH. Branch line freight services are currently available between the main line and Portsmouth and over the Sarah Long Bridge into Maine on a Class 1 track that limits speeds to 10 MPH. The Eastern Railroad corridor also ran from Boston to Portland, via Seabrook and Portsmouth in the RPC region. This later became the B&M Main Line East, and is also known as the Hampton Branch, but is no longer in active rail use. The State has owned the segment from Hampton center to the Massachusetts border since the late 1990s, and is in negotiation to purchase the recently abandoned balance of the line, from Hampton to Portsmouth. Intermodal (rail-truck) facilities operated both by Pan Am and Conrail in the Boston area and by the St. Lawrence and Atlantic Railway in Auburn, Maine are within easy reach of the Seacoast region. Through these connections, shippers have access by rail to points throughout North America and, using Rail Land Bridge services, throughout the world.

Truck

While the trucking industry is privately operated, it depends upon state and local government to provide and maintain the highway network upon which it operates. The majority of freight shipments, both long distance movement to distribution centers and local delivery services to factories, wholesale and retail facilities, and households within the United States, occur via truck. Southeastern New Hampshire shippers and receivers are well served by motor carriers. High quality services are provided by the following types of carriers:

- National TL (truckload) and LTL (less-than-truckload) carriers such as Roadway and J.B. Hunt
- Regional TL and LTL carriers such as Atlas Motor Express.
- Bulk liquid carriers such a Superior and Matlack.
- Private carriers serving special markets such as the Wal-Mart fleet.
- Major parcel carriers such as United Parcel Service and Federal Express.

Air Freight

The region enjoys the potential for direct airfreight service at Pease International Tradeport. The Fixed Base Operator at Pease Airport provides cargo handling capability for build, break, load, offload, and onload, and includes cross dock transfer fly-truck, truck-fly operations. The facility can accommodate the largest cargo planes and includes 45,000 square feet of warehouse facilities available in close proximity to rail, deep water port and I-95. Boston's Logan Airport and the Manchester-Boston Regional Airport are located less than 50 miles away, adding access to a wide variety of air cargo services serving markets throughout North America and the world.

Pipeline

A natural gas pipeline is currently in place. As reported in the Federal Energy Regulatory Commission publication FERC/EIS-0111D, dated April 1997, Granite State Pipeline operates "a 10- and an 8-inch-diameter pipeline between Haverhill and Exeter" as well as "an 8-inch-diameter pipeline between Exeter, New Hampshire and Wells, Maine." (Federal Energy Regulatory Commission, 1997) In addition, Portland Natural Gas Transmission System and Maritimes & Northeast Pipeline, L.L.C. (Maritimes), are currently developing expanded natural gas pipeline service with the construction of a 30-inch-diameter high-pressure natural-gas pipeline between Dracut, MA and Wells, Maine. The pipeline is designed to deliver 60 million cubic feet per day of natural gas from the Sable Offshore Energy Project, offshore from Nova Scotia. The project includes 31.4 miles of 30-inch-

diameter pipeline passing through Plaistow, Newton, East Kingston, Exeter, Stratham, Greenland, Portsmouth and Newington, in Rockingham County. The project also includes lateral lines as follows: 0.6 mile of 20-inch pipeline between the main trunk line in Plaistow and Haverhill, MA and 1.1 miles of 16-inch-pipeline in Newington. A number of projects are currently underway to interconnect pipelines to bring additional natural gas into the New England region from the Southeast states.

Goods Movement

The primary source of data regarding freight movement is the FHWA Freight Analysis Framework (FAF) and this system measures goods movement in three ways:

- Value – In 2015 dollars
- Tons – In thousands of short tons (2000 lbs.)
- Ton-miles – Product of tons and the weighted average distance by mode of shipment

Depending upon the unit of measure, each mode of goods movement handles a different percentage of the total volume of freight moving into and out of the state. The facts and figures in this section will focus on the tonnage of freight moved, however, Appendix C will include the full tables with value and ton-miles as well. With the exception of the data for the Port of New Hampshire, all information available is for the state as a whole and not specific to the region.

With the exception of air based freight services at Pease Tradeport, and Atlas Motor Express in Plaistow, freight transportation companies do not operate transportation facilities in the RPC region. Freight carriers located in other parts of New Hampshire and in other New England states use trucks to carry freight to and from companies located here. LTL and TL motor carriers all (except Atlas) operate from terminal facilities outside of the region. With the minor exception of limited direct rail loading in Portsmouth and Newington, all rail shipments are loaded in or on rail cars at facilities located outside the area as well. The Port of New Hampshire is expected to expand and accept containerized shipments. Currently they move by highway to and from ports in Boston, Montreal and New York. Containerized shipments to and from the Far East generally move to rail facilities in Massachusetts for rail shipment via "Mini Land Bridge" to the West Coast for ship movement across the Pacific. Increasing volumes of airfreight move though Pease, but most airfreight continues to move through Logan. Carriers provide most truck services through freight terminals located elsewhere in New Hampshire or in Massachusetts.

Data from the Freight Analysis Framework (FAF) version four (USDOT), shown in ***Figure 3-23***, estimates that currently about 100 million tons of freight is shipped to, from, or within New Hampshire (2015). In terms of goods originating in New Hampshire, trucks carrying 92.6 percent of the tonnage while

Figure 3-23: New Hampshire Goods Movement (2015)

	Originating in NH		Destined for NH	
Mode	1000s of Tons	Millions of Dollars	1000s of Tons	Millions of Dollars
Truck	37,418.26	$35,035.6	47,256.92	$53,270.2
Rail	164.16	$137.6	2,071.99	$845
Water	61.22	$432.9	6,714.49	$2,902
Air (inc. truck-air)	15.75	$1,404.9	12.59	$1,165.6
Mult modes & mail	247.14	$8,921.9	536.85	$10,475
Pipeline	2,489.59	$716.9	2,889.15	$841
Other & unknown	3.97	$15.2	1.19	$37.8
	40,400.09	**$46,665.12**	**59,483.18**	**$69,536.8**

pipelines move another 6.2 percent. Multiple mode and mail movement (.6%), Rail (0.4%), water (0.15%), and air (0.04%) make up the small remaining portion of goods movement. The mode of travel for goods destined for a location in New Hampshire is somewhat more distributed. While trucks carry 79.5 percent, the Port of New Hampshire brings in 11.3 percent and pipelines provide another 4.9 percent. Rail brings in 3.5 percent while air, and multiple modes and mail, combine to carry about 1 percent of goods. state. By value there was approximately $116 billion in shipped goods moved to or from New Hampshire. 75 percent of the value originating in New Hampshire moves by truck while another 19 percent travels by multiple modes and mail. Air makes up the third highest percentage at 3 percent, while pipeline (1.5%), water (0.0%) and rail (0.3%) make up the rest. For goods destined for a location in New Hampshire trucks carry 76.6 percent of the total value while multiple modes and mail carry the bulk of the remainder at 15.1 percent. The Port of New Hampshire brings in another 4.2 percent, air 1.7 percent, and rail and pipeline 1.2 percent each.

PUBLIC TRANSPORTATION

Public transportation plays an important and growing role in addressing the mobility, traffic congestion, and air quality issues facing the RPC region. The number of communities in the region served by transit has increased in the past ten years, from five to seven; and ridership on all forms of transit has seen dramatic growth in response to rising fuel prices and growing transit dependent populations. Still, fewer than a third of the 26 communities in the region are served by public transportation, and significant challenges exist to expanding services, including funding availability, low density development patterns making fixed route service inefficient in many towns. Regional transit routes are shown on ***Map 3-6.***

Local and Regional Public Transportation Service

Two public transit agencies serve the communities in the RPC region. The Cooperative Alliance for Seacoast Transportation (COAST) provides fixed-route bus service in Portsmouth, Newington, Exeter and Stratham; with connections northward to Dover, Somersworth, Rochester, Newmarket, Farmington, and South Berwick, Maine. COAST ridership has seen a slight decline since 2013 as fuel prices have declined and COAST's Route 7 service has been curtailed. However ridership is up 27% in the past decade, and has more than doubled since 2000 as shown in ***Figure 3-24***. Most COAST services operate with one hour headways during the day, though trunk Route 2 and the Portsmouth Trolley system feature 30 minute headways during peak commute hours. This mitigation measure for the Newington-Dover Spaulding Turnpike Expansion project has helped drive this long term increase, along with other popular services such as the Clipper Connection serving Portsmouth Naval Shipyard.

The Greater Derry-Salem Cooperative Alliance for Regional Transportation (CART) serves the RPC communities of Salem and Hampstead; as well as Derry, Londonderry, Chester, and out-of-region medical facilities in Manchester. CART provides mainly demand-response transit service given the low density of much of its service area, but added a flex route service in 2012 with the Salem Shuttle. As a demand-response service, a large portion of CART's ridership is senior citizens, individuals with disabilities and other lacking private transportation. CART has grown from carrying fewer than 500 passengers per month at start-up in 2006, to moving approximately 1,200 passengers/month in 2017.

Figure 3-24: COAST Ridership

Fiscal Year	Ridership
2000	199,967
2001	211,920
2002	212,502
2003	242,235
2004	293,917
2005	316,867
2006	354,433
2007	375,535
2008	398,853
2009	370,068
2010	416,942
2011	461,866
2012	506,514
2013	506,173
2014	489,408
2015	487,594
2016	477,729

Source: COAST

A third publicly funded transit system is UNH Wildcat Transit. Wildcat Transit operates extensive on-campus shuttle service, and also runs regional routes connecting the UNH campus in Durham to Newington and Portsmouth in the RPC region, as well as to Dover, Madbury, and Newmarket. The service areas of all three transit providers are shown on ***Map 3-6***

Intercity Bus Service

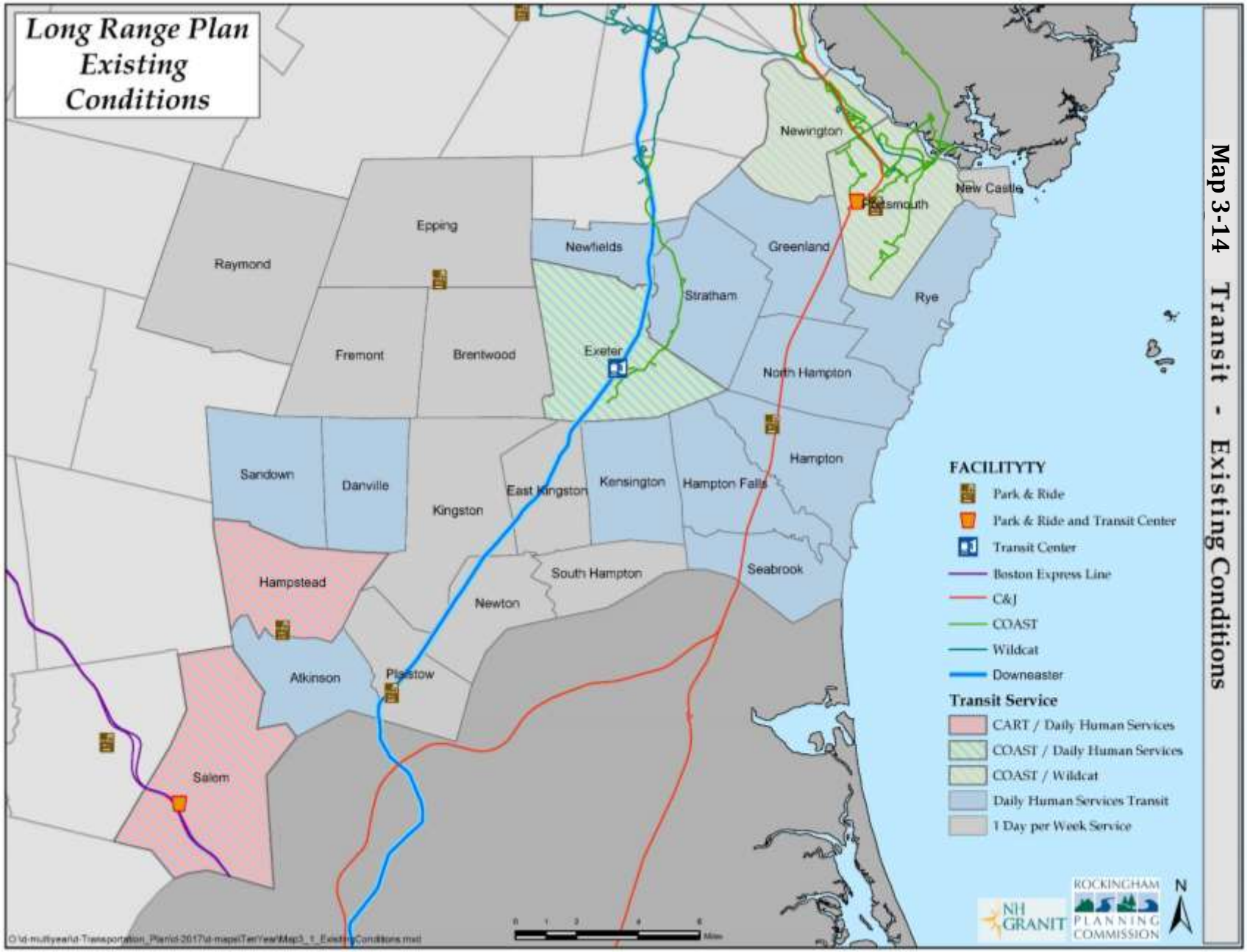
Intercity bus service is available in the I95 and I93 corridors, with an emphasis on Boston-bound commuter travel as well as access to Logan Airport. C&J Bus Lines, provides 32 round trips daily between Boston and the Portsmouth Transportation Center, with northbound connections to Dover. In the I93 corridor Boston Express operates extensive Boston-bound commuter bus service out of Exits 4 and 5 in Londonderry plus Exit 2 in Salem, with a combined 29 daily round trips. Greyhound provides two daily round trips between Portland and Boston with service to downtown Portsmouth. Between 2013 and 2016 NHDOT supported a pilot East-West Express transit connection between Portsmouth, Epping, Manchester airport and downtown Manchester. While East-West service between the Seacoast, Manchester and Concord has long been seen as a need in the region, the service was not as productive as projected, and was discontinued at the end of its pilot funding in 2016. Factors in this underperformance likely include declining enplanements at Manchester Airport, and the relative ease of access and inexpensiveness of parking relative to Boston, which reduce the incentive to take transit.

Passenger Rail Service

Amtrak's Downeaster service between Boston, Portland and Brunswick Maine includes several station stops in Southern Maine, Northern Massachusetts, and three New Hampshire communities – Exeter, Durham, and Dover. The service provides five daily round trips between Boston and Portland. Three daily trains extend the service from Portland north to Freeport and Brunswick, Maine. In 2016 the Northern New England Passenger Rail Authority (NNEPRA), which oversees the Downeaster service, completed an enclosed layover facility in Brunswick.

This facility will eventually allow all five daily trains to make stops at Freeport and Brunswick with a potential 6th daily round trip being added between Brunswick and Boston. During 2016 the Downeaster carried over 492,000 riders, with 30 percent of passengers boarding or alighting at New Hampshire stations. MBTA commuter rail service is available from Newburyport, Haverhill and Lawrence in Northern Massachusetts.

In 2014-2015 a feasibility study was conducted to determine if an extension of the Haverhill commuter service to Plaistow, N.H., would have sufficient ridership to be financially viable. The service concept also included a partnership with the MBTA to construct a new layover facility at or near the station site. In 2015 voters in Plaistow rejected the rail extension concept.


Long Range Plan
Existing
Conditions
Map 3-14 Transit - Existing Conditions
Raymond
Epping
Fremont
Brentwood
Newfields
Exeter
Stratham
Greenland
Newington
Portsmouth
New Castle
Rye
North Hampton
Hampton
Hampton Falls
Kensington
East Kingston
Kingston
Sandown
Danville
Hampstead
Atkinson
Plaistow
Newton
South Hampton
Seabrook
Salem
FACILITYTY
Park & Ride
Park & Ride and Transit Center
Transit Center
Boston Express Line
C&J
COAST
Wildcat
Downeaster
Transit Service
CART / Daily Human Services
COAST / Daily Human Services
COAST / Wildcat
Daily Human Services Transit
1 Day per Week Service
NH GRANIT
ROCKINGHAM PLANNING COMMISSION
N

Park and Ride Facilities

There are currently seven Park & Ride facilities in the region operated by the N.H. Department of Transportation (NHDOT). These include lots in Epping at the intersection of Routes 101 and 125; in Hampstead at the intersection of Route 111 and 121; in Hampton at the intersection of Route 101 and 27; in Plaistow on Westville Road just east of Route 125; in Salem at Exit 2 on I93 and in Portsmouth at Exit 3A on I95, and on Route 33 just east of I95. The Exeter rail station, operated by the Town of Exeter, also functions as a Park & Ride facility. Of these, three feature Boston-bound intercity transit service (Portsmouth, Salem and Exeter). Those park and ride facilities without transit service see lower usage. Park & Ride locations are noted on **Map 3-14.**

Other Community Transportation Services

In addition to the transportation providers listed above, there are a number of other transportation services available to communities in the RPC region. These can most easily be differentiated by type of service provided.

Shuttle and Taxi Services

Numerous companies offer private market-rate shuttle services between the RPC region, Logan Airport and Manchester-Boston Regional Airport. Both door-to-door service and scheduled pickups at central locations are available. Over twenty companies also offer local and regional taxi service.

Special Population Services

There are more than two dozen health and human service agencies and volunteer driver organizations in Rockingham County providing demand response transportation for agency clients or specific eligible populations such as senior citizens or individuals with disabilities. Towns shown in red or blue on **Map 3-14** benefit from demand-response transit service for seniors and individuals with disabilities that operate at least five days per week. A gap in service is readily identifiable in the center of Rockingham County, shaded gray, roughly following NH125. This area is west of the TASC volunteer driver program service area, and east of the region covered by Greater Salem Caregivers and Community Caregivers of Greater Derry.

Many of these agencies have been involved with regional planning initiatives in the Derry-Salem area or Seacoast area focused on coordinating and consolidating functions such as trip scheduling and dispatching, and expanding access in communities with limited service. These collaborative efforts are formalized through the Southeast New Hampshire Regional Coordination Council (RCC) for Community Transportation (RCC), and the companion Greater Derry-Salem RCC in western Rockingham County.

TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) is an approach to improving the efficiency of the transportation system through encouraging alternatives to driving alone – particularly for commute trips. Three TDM initiatives serve the RPC region, including statewide programs for New Hampshire and Massachusetts, as well as commuteSMARTSeacoast, the regional Transportation Management Association (TMA) working with Seacoast employers to encourage alternatives to driving alone on daily commutes. Efforts targeting Boston area commuters have a successful history, given high levels of congestion, high parking costs, a long commute distance, and a Massachusetts state law requiring large employers to invest in commute trip reduction programs. Initiatives in New Hampshire have had a more difficult

time convincing employees to shift modes, given relatively limited traffic congestion, relatively abundant free parking, less frequent transit services, and lack of a state mandate for employers. However, over the past ten years these efforts have gained traction. Multiple years of increasing gas prices were one driver of this, but even with relatively low gas prices in 2015-2017, interest and participation in ridesharing has continued to increase. Existing TDM programs serving the region are described below.

Rideshare Programs Managed by NHDOT and MassDOT

MassRides, funded by the State of Massachusetts, operates a relatively successful ride matching and vanpool program for Boston commuters. Daily vanpools to Boston and suburban employment centers depart from Hampton (2), Portsmouth (4), Salem (1), and other New Hampshire communities outside the RPC region. Between 1996-2011 the NHDOT ran a statewide Rideshare program designed to match individuals interested in carpooling or vanpooling using an on-line ride matching service. This program was eliminated by the legislature in 2011 as part of cuts to the NHDOT budget, though a statewide ride matching database continues to exist, with software purchased by NHDOT for use by regional ridesharing initiatives.

Transportation Management Associations (TMAs)

In 2013 COAST launched *commuteSMARTseacoast* – a TMA focused on employees at Pease Tradeport and other major employers in the Greater Portsmouth-Dover Area. TMAs work with employers to promote alternative commute options to employees and establish incentives such as discounted transit passes, online ride matching programs, commuter challenges and prize drawings, emergency rides home to provide flexibility for transit users, and programs allowing use of pre-tax dollars for transit or vanpool expenses. Funding for commuteSMART-seacoast is part of the Newington-Dover Little Bay Bridges highway widening project. As of 2017 commuteSMARTseacoast has signed up 49 member companies representing 11,599 employees, established over 243 carpools, and won national awards for successful commuter challenge events encouraging commuters who previously drove alone to try alternate commute options. As part of commuteSMART's month-long 2017 Business to Business (B2B) commuter challenge, 820 participants logged 7,291 commute trips via carpool, transit, walking, bicycling or telecommuting. These avoided 212,438 automobile miles, saving $121,318 in normal auto commute costs. Funding has also been programmed as part of the I93 widening project for TDM activities in the I93 corridor. Planning for these activities is currently underway by NHDOT.

Telecommuting Infrastructure

The number of people working from home and telecommuting in the United States has grown significantly since 2000. Between 2000 and 2015, those working from home nationally grew from an estimated 3.3 percent to 4.4 percent of the workforce. Telecommuters make up a larger share of the workforce in Rockingham County, where telecommuting grew from an estimated 4.1 percent to 6.2 percent of the workforce between 2000 and 2015. For Portsmouth this share is still larger, and grew from 5.4 percent to 9.2 percent between 2000 and 2015.

This relatively high instance of telecommuting in the region is consistent with the relatively high education levels and employment mix in the region. The increase since 2000 is also consistent with improvements in access to broadband telecommunications infrastructure, but there are still gaps within the region.

BICYCLE FACILITIES AND PROGRAMS

While the private automobile is the dominant mode of transportation in the RPC region, and will continue to be for the foreseeable future, improving the safety and convenience of non-motorized transportation is a key policy of the MPO. According to the most recent National Household Travel Survey (2009), more than 60 percent of all trips are fewer than five miles in length, and more than 22 percent are shorter than one mile – distances easily traveled by bicycle or on foot. However, more than 80 percent of these trips are taken with an automobile. Converting some of these short trips to bicycling and walking has the potential to reduce vehicle miles traveled, and consequently congestion, air quality impacts, and parking demand in downtowns. Investments in bicycle and pedestrian facilities also support public health and safety; and even economic development in the form of bicycle tourism. Achieving this increase in non-motorized transportation, though, will require investments in a combination of facility improvements and programs to encourage bicycling, teach safe bicycle operation to children and adults, and ensure enforcement of laws related to bicycle operation and safety.

The ***"Five E"s*** of bicycle/pedestrian accommodation:

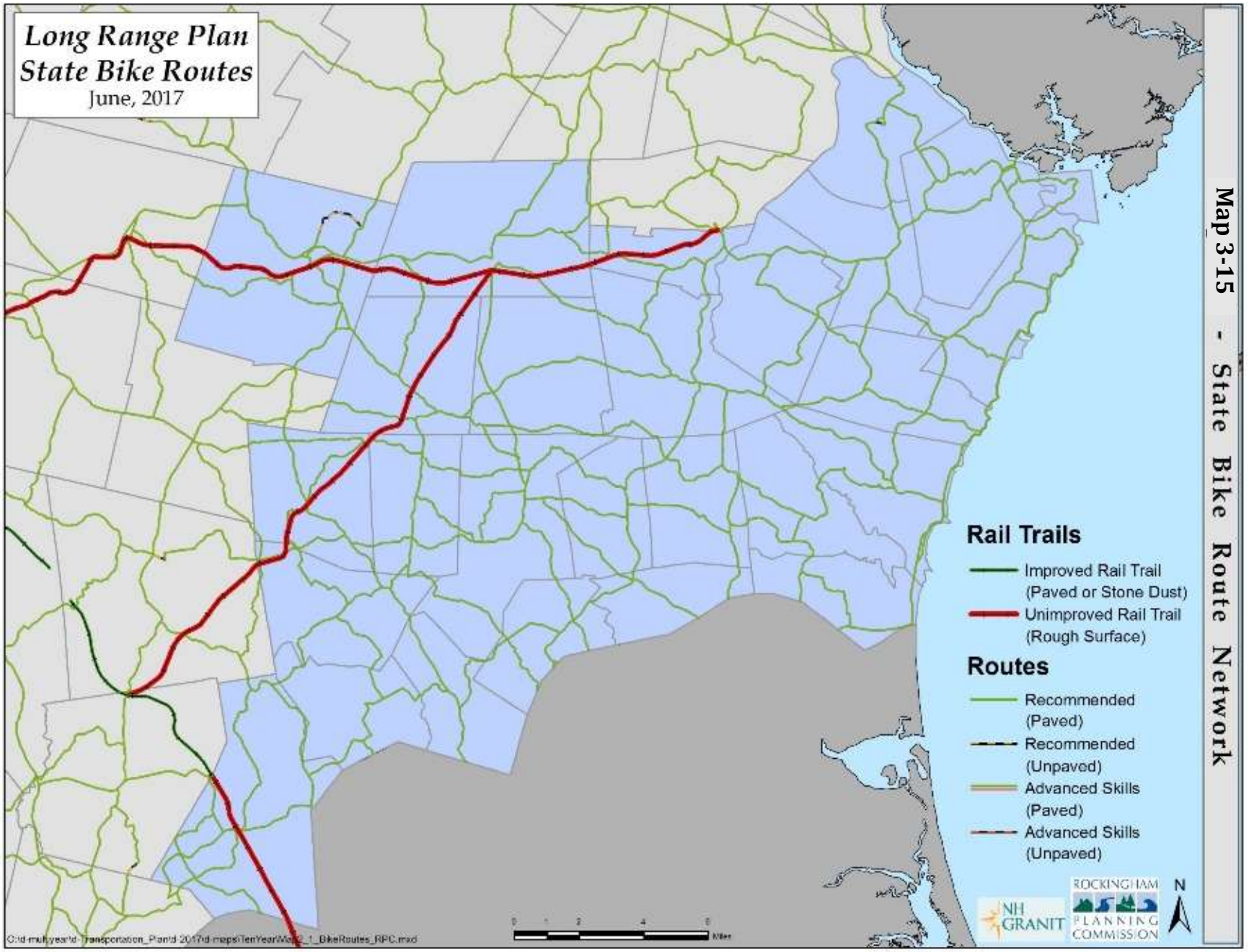
- Engineering
- Education
- Encouragement
- Enforcement
- Evaluation

Bicycle Transportation Facilities

For the purposes of this chapter, bicycle transportation facilities consist of shoulders with a width of four feet or greater on the region's roads (the minimum width for a shoulder bicycle route recommended by AASHTO, except next to curb or guardrail where minimum width increases to five feet) and paved off-road multi-use paths. This said, roads without such provisions are still legally and appropriately used by bicyclists. In addition, the State Bureau of Trails maintains numerous trails in the State and region that are unpaved or feature a stonedust surface, such as the Rockingham Recreation Trail connecting Newfields-Manchester, and Fremont-Windham .

Paved off-road paths in the region are uncommon, but include the Southern New Hampshire Rail Trail being developed between Salem and Concord, the recently completed Pease Multi-Use Path at the south entrance to the Pease TradePort, a path connecting Fox Point Road in Newington to the Tradeport, and a side-path in Odiorne State Park in Rye. Planning is also underway for the New Hampshire segment of the East Coast Greenway, stretching from Florida to Maine. The State of New Hampshire is currently negotiation with Pan Am Railways 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 Massachusetts border, on which the Town of Seabrook is actively pursuing rail trail development.

The remainder of what may be termed bicycle facilities in the region consists of paved shoulders on roads. Shoulders on many state roads in the region are narrower than four feet. **Map 3-15** shows the State Bicycle Route Network in the MPO region. These routes were designated through a process that gathered public input on commonly traveled routes, then assessed these routes for safety and filled in connections between towns based on a combination of shoulder width and traffic volume.


Long Range Plan
State Bike Routes
June, 2017
Rail Trails
Improved Rail Trail
(Paved or Stone Dust)
Unimproved Rail Trail
(Rough Surface)
Routes
Recommended
(Paved)
Recommended
(Unpaved)
Advanced Skills
(Paved)
Advanced Skills
(Unpaved)
NH GRANIT
ROCKINGHAM PLANNING COMMISSION
N
Map 3-15 - State Bike Route Network

The RPC has worked with Seacoast Area Bicycle Riders (SABR) and member communities to secure funding to extend shoulders and complete regional routes including the Great Bay Bicycle Loop, the Exeter-Hampton-North Hampton Bicycle Loop and the NH Coastal Byway. The success of these efforts has varied by municipality, depending on the interest of Towns to appropriate matching funding needed to access federal funding under the Transportation Alternatives (TAP), or Congestion Mitigation/Air Quality (CMAQ) programs. NHDOT has adopted a policy to add width for shoulder bicycle routes when state highways are reconstructed, which happens on a 20-30 year cycle. NHDOT Maintenance District 6 has also created extra shoulder width in some cases as part of routine resurfacing by narrowing travel lanes to 11 feet or even 10 feet from a traditional 12 feet or more. In some cases opportunities remain to allocate more width to shoulders on low-speed roads where 10 foot lanes would be adequate (Institute for Transportation Engineers).

After "maintenance of roads and bridges", respondents to the UNH Regional Needs Survey identified "availability of bike paths" as the next highest priority for increased transportation system investment in the region. Community meeting and other public input underscored this, identifying a particular need for improved bicycle and pedestrian facilities within communities that connect residential areas to services and schools and provide safe passage for students or adults on foot or bicycle. Reflecting this, six communities in the RPC region have initiated Safe Routes to School (SRTS) initiatives, including Hampton, Newfields, Plaistow, Portsmouth, Rye, and Seabrook. While federal Safe Routes to School funds have now been rolled into the new Transportation Alternatives program under MAP-21 and the FAST Act, the SRTS model remains an excellent one for municipalities and school districts.

Supporting Facilities for Bicycles

A safe place to park your bike can be a major factor for commuters deciding whether to drive or bicycle to school, work or recreational areas. Some larger businesses in the area do provide amenities for bicycle commuters such as allowing them to store their bicycles indoors and providing shower facilities.

Another important step is to support better connections between bicycles and other modes of transportation. This includes secure parking at bus stops and train stations as well as accommodations for carrying bicycles such as racks on the front of buses. COAST has installed bike racks on the front of all their buses, as has Wildcat Transit. The NHDOT has installed bicycle lockers or racks at most Park & Ride locations as well as the Exeter rail station. With assistance of FTA Transit Enhancements funding from COAST, the City of Portsmouth has made extensive improvements to bicycle parking at downtown transit stops and other locations the past four years.

In 2017 Portsmouth launched a city-wide bike-share program in collaboration with the firm Zagster. Bike stations are located in five pilot sites around the city, and for a nominal membership fee users can check out a bicycle free for up to two hours, with incremental cost for longer trips.

Education, Encouragement, and Enforcement

Providing new facilities is only part of the solution to encouraging non-motorized alternatives to driving. The other part of the equation involves changing behavior – of both potential cyclists as well as drivers. This integrated approach is often referred to as the "Five Es" – Engineering (bicycle infrastructure) must be accompanied by efforts at Education (regarding cyclists rights and responsibilities), Encouragement (to try a new way to travel),

Enforcement (of traffic rules for both drivers and cyclists), and Evaluation to ensure data-driven decision making.

At present, educational efforts in the region and much of the state are limited to outreach to young children first learning to ride a bicycle. The Bike/Walk Alliance of New Hampshire (BWANH) provides classroom instruction in bike safety to 4th and 5th grade classes with funding through the Safe Routes to School program. Efforts targeting older children, as well as adult cyclists and drivers are more limited. RSA 265:143a, passed in 2010, clarified many state traffic laws around bicycling, and included an innovative provision known as the Three Foot Law – that automobiles must allow at least 3 feet of buffer when passing a bicycle at 30 mph, and an additional foot for each 10 mph above that. BWANH has worked to get information on bike-related traffic law into the state driver education curriculum, as well as into police officer training.

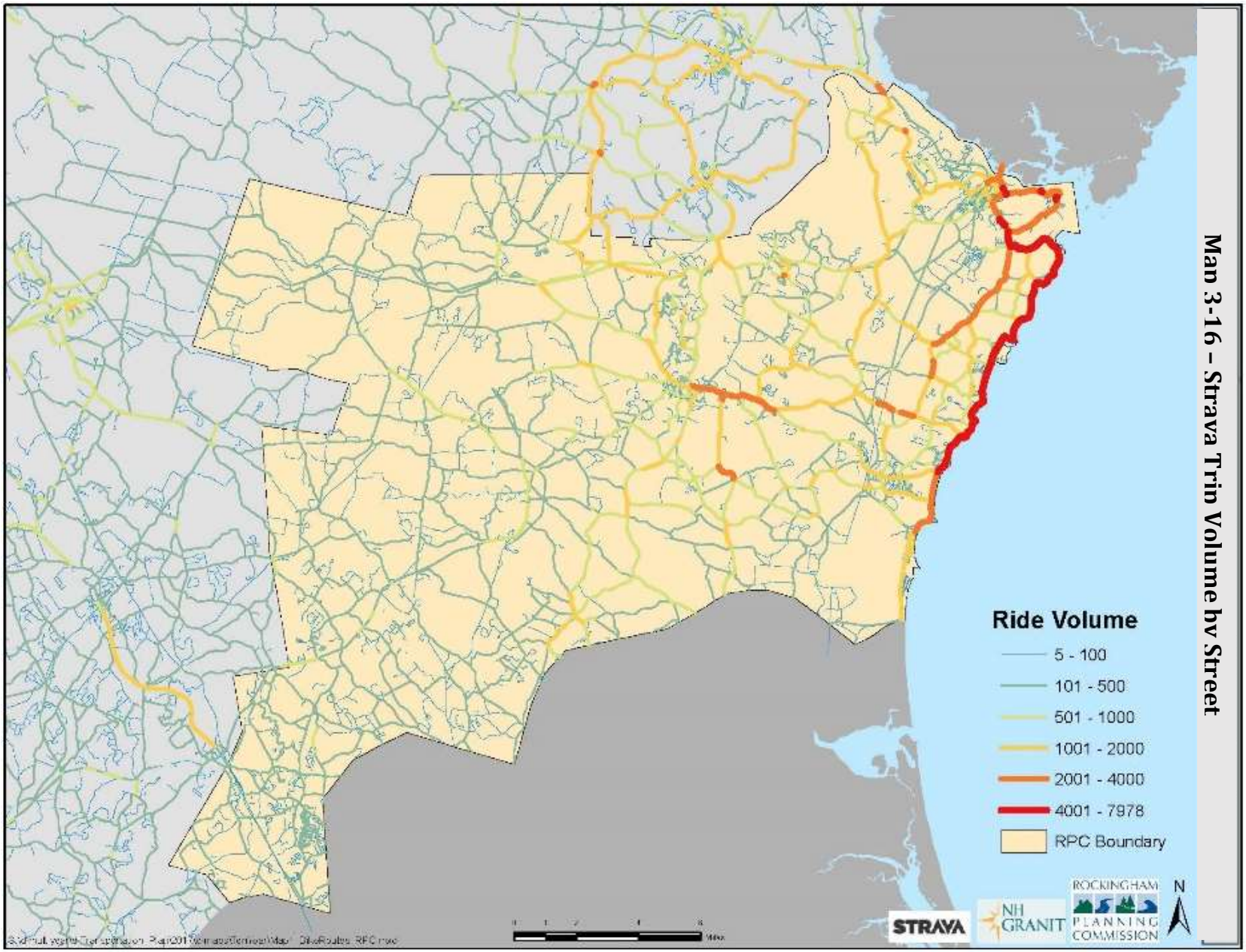
Initiatives to encourage more people to ride bicycle and ensure they can do so safely include the RPC's work with commuteSMARTseacoast to promote annual events for national Bike Month and Seacoast Bike/Walk to Work Day, and assistance to communities in implementing Safe Routes to School programs.

A challenge in evaluating the success of facility improvements or education and encouragement efforts is the lack of data on bicycling and walking relative to automobile traffic. Improving data on bicycle and pedestrian travel volume is a key need identified through the work of the BPTAC, the Regional Master Plan process, and efforts to date to define performance metrics for the MPO. While extensive data are available on automobile traffic volumes, data on bicycle and pedestrian travel has to-date been collected only as part of specific planning studies such as the Corridor Management Plan for the NH Coastal Byway, the NH-ME Connections Study, or the Portsmouth Bicycle/Pedestrian Master Plan. In 2015 RPC purchased automated bicycle and pedestrian counting equipment as part of a statewide project initiated through the BPTAC. RPC is also analyzing three years of data from the smartphone app Strava, purchased by NHDOT. The Strava app is used by many recreational walkers and bicycle riders for tracking riding and walking trips, and allows a statewide picture of major walking and riding routes.

Map 3-16 shows Strava trip volume from 2016, highlighting the relatively heavy usage of NH1A and NH1B – both State bicycle routes, part of U.S. Bike Route 1, the NH Coastal Byway. Work is underway to identify the extent to which Strava volume data correlates with overall bike/ped usage. Combined with an expanded program of manual bicycle and pedestrian counts, the Strava data and automated counting equipment will expand the MPO's data on bicycle and pedestrian travel patterns to support planning and project evaluation.

PEDESTRIAN FACILITIES AND PROGRAMS

In the RPC region, pedestrian facilities vary considerably from community to community. Portsmouth, Exeter and Hampton feature substantial downtowns, as well as centrally located elementary schools, which encourage people to walk. Many of the more rural communities in the region have few if any sidewalks. Beyond sheer size, the presence or absence of sidewalks relates in large part to when and how a community has grown. Salem provides a case in point. While the largest municipality in the region, Salem has experienced much of its development in the last 40 years when accommodating the automobile has been the focus of most transportation planning. As such, the town has a less comprehensive sidewalk network than smaller communities that developed earlier, such as Portsmouth and Exeter.



Map 3-16 – Strava Trip Volume by Street

In more rural communities residents walk on shoulder or in the automobile travel lane. While people have done this for generations, increasing traffic volumes and speeds, and drivers increasingly distracted by cell phones and other devices, have reduced safety for all users of the road, whether on foot, on bicycle or in an automobile. This can be made somewhat safer when shoulder lanes are available for use.

In general sidewalks and other pedestrian accommodations are limited in the more rural communities in the region, with an exception for recreational trails in some communities. Much of this has to do with density, and the relatively long distances between schools or other town facilities and the nearest residential neighborhoods which would discourage walking even if sidewalks existed. Communities with concentrations of residential development or other trip produces in their town center, though, are recognizing that pedestrian facilities will play an important role in future development. For example, in Plaistow sidewalks are already in place in parts of Town and the Town has developed a three-phase plan for developing sidewalks linking all the major facilities in the community that generate substantial pedestrian traffic. The Town has implemented the plan incrementally using Transportation Enhancement (TE) funds. The Town of Salem also has sidewalks in place in some areas, but they do not form a cohesive network.

Construction of sidewalks can be expensive, and many communities are unable to identify local funds to fully support construction of facilities for pedestrians. The Transportation Alternatives Program (TAP) and its predecessor the TE program, have been is the primary sources of federal funding assistance for sidewalk construction used in New Hampshire. These funds have always been limited and highly competitive, and will be still more competitive in the future as TAP program is funded at a level about 30% lower than the combination of the four programs it replaced.

Another barrier to sidewalk construction is the cost of long term maintenance, including winter snow clearing; and the question of who assumes this responsibility. Current NHDOT policy is to build sidewalks as part of highway reconstruction projects, but only if municipalities request the sidewalks and will assume maintenance responsibility. In some cases municipalities have been unwilling to take on this maintenance responsibility out of cost concerns, and the result has been a lost opportunity to improve pedestrian safety along state highways.

Figure 3-25: Road Miles by Functional Class and Community

	Rural						Urban						
							Principal Arterials						
Town	Private Roads	Principal Arterials	Minor Arterials	Major Collector	Minor Collector	Local Road	Interstate	Other Freeways & Expressways	Other	Minor Arterial	Collector	Local Road	Grand Total
Atkinson	11.8								1.2	4.2	2.2	49.8	69.2
Brentwood	6.4			3.4	1.3	32.1		8.9	1.8		2.5	9.3	65.8
Danville	12.9				1.5	11.3			1.7		2.9	24.0	54.4
East Kingston	7.3			2.5	2.1	7.4					4.8	7.1	31.2
Epping	22.4	1.8			4.1	38.8		16.2			5.0	27.9	116.1
Exeter	17.9		0.6	1.0	1.8	11.7		15.5		9.5	9.3	45.6	112.8
Fremont	15.2			3.6	1.4	23.4					1.4	15.6	60.6
Greenland	4.1			1.1		3.8	6.2			3.3	3.7	23.5	45.8
Hampstead	14.3								4.2	5.0	3.4	59.8	86.7
Hampton	10.1					3.1	8.5	4.2	11.8	13.8	9.3	56.1	116.9
Hampton Falls	0.9			0.4	6.0	16.4	4.3			1.8	1.9	9.2	41.0
Kensington	2.4			6.7	3.5	20.6							33.2
Kingston	9.6					11.1			10.6		6.7	52.0	90.0
New Castle	3.4									2.6		5.0	11.0
Newfields	0.4				2.4	5.2					4.2	9.0	21.1
Newington	19.0					8.4		7.7		1.0	2.4	9.9	48.4
Newton	4.4			0.6		1.7					10.3	28.3	45.3
North Hampton	6.5			1.1		10.3	7.9		3.4		12.4	22.4	64.0
Plaistow	4.7								3.5	7.0	13.9	28.2	57.2
Portsmouth	24.9						18.0	10.4	6.1	14.1	8.1	82.9	164.5
Rye	7.7					4.2			1.2	1.1	15.2	34.7	64.1
Salem	11.2					0.2	12.2		9.2	14.1	17.4	153.0	217.3
Sandown	7.7			0.4		12.8					6.6	42.8	70.2
Seabrook	8.3			0.1			4.9			4.7	5.2	38.3	61.4
South Hampton	2.6			1.4	2.9	8.3						1.8	17.1
Stratham	9.8					9.4	0.0	4.7		6.0	1.5	49.5	80.9
Grand Total	**245.9**	**1.8**	**0.6**	**22.3**	**27.0**	**240.3**	**61.9**	**67.6**	**54.6**	**88.2**	**150.3**	**885.5**	**1846.2**

4. Current Trends and Future Conditions

Vision and Objective

The regional vision for the future, as established in the Regional Master Plan, indicates a desire for a strong regional economy, preservation of community character, and maintenance of the region's natural and recreational resources. Further, the regional vision states a desire to strengthen community centers and maintain traditional landscapes, provide a variety of housing choices, invest in supportive infrastructure, and provide improved services for residents and businesses. Projection and estimates of future conditions supports the regional vision by identifying and comparing the benefits and impacts of anticipated outcome, or outcomes. It also can help decision-makers understand how policy and project choices may impact achieving a desired future condition. In this case, the RPC is utilizing planning and forecasting tools to gauge two prospective alternatives for the magnitude of growth in the region (slow or strong growth), and two alternatives for the pattern of that change on the landscape (dispersed or concentrated growth).

Basis in Projections

Independently developed population and employment projections, shown in ***Figure 4-1***, offer different visions of change in the region between now and 2040. The population is expected to remain relatively flat with a growth rate of about 0.31 percent per year. However, employment has a different trajectory, growing at slightly over 1 percent per year. Examining these different expectations of growth, as well as where people live and work around the region, can help decision makers understand what it means for each of those projections to be an accurate prediction of the future. From that understanding, recommendations can be developed that point the communities and region towards achieving the desired outcomes, or in some cases, away from undesired outcomes.

Population Projections

The New Hampshire Office of Strategic Initiatives (OSI), formerly the Office of Energy and Planning (OEP), is responsible for producing population projections at the state, county, regional planning commissions, and community levels every five years. The most recent set of projections was completed in 2013 utilizing 2010 census data as the basis. OEP worked directly with the regional planning commissions to derive planning commission and community level projections from estimates completed at the county and state level. These projections show a very low growth rate (0.27 percent per year) with the region increasing from 178,000 to 193,000 residents. This is primarily due to slowing natural population growth (slightly more births than deaths) and continued small positive migration into the region. ***Figure 4-2*** shows how the distribution of the population by age and gender is expected to change between 2010 and 2040. It is expected that the population aged 65 and over will more than double while decreases are expected in most other younger age groups over that period. This has implications for the labor force because, despite a growing population, most of this increase is in a portion of the population that does not participate in the labor force.

Figure 4-1: Summary of Population and Employment projections used as the basis for scenario planning exercise

	2010	2015	2020	2025	2030	2035	2040	CAGR[1]
Projected Regional Population (OEP)[2]	191,617	191,617	195,328	199,633	204,092	206,652	207,137	0.31%
Estimated Regional Employment (ELMI)[3]	112,612	115,429	120,163	125,090	130,219	135,559	141,119	0.8%
Estimated Regional Labor Force(ELMI)[4]	99,044	99,807	100,140	100,327	99,785	99,593	99,805	-0.08%
Employed Labor Force (ELMI)[5]	87,229	96,321	96,643	96,823	96,300	96,115	96,319	0.07%
Employees that Live & Work in Region[6]	48,358	42,951	44,712	46,546	48,454	50,441	52,510	0.8%
Live in Region & Work outside of Region[6]	38,871	53,370	51,931	50,277	47,846	45,674	43,809	
Commute from Outside Region[6]	64,254	72,478	75,451	78,544	81,765	85,118	88,609	0.8%

1 – Compound Annual Growth Rate (% per year)

2 – Regional totals derived from State and County projections of population to 2040 completed in November, 2016 by OEP.

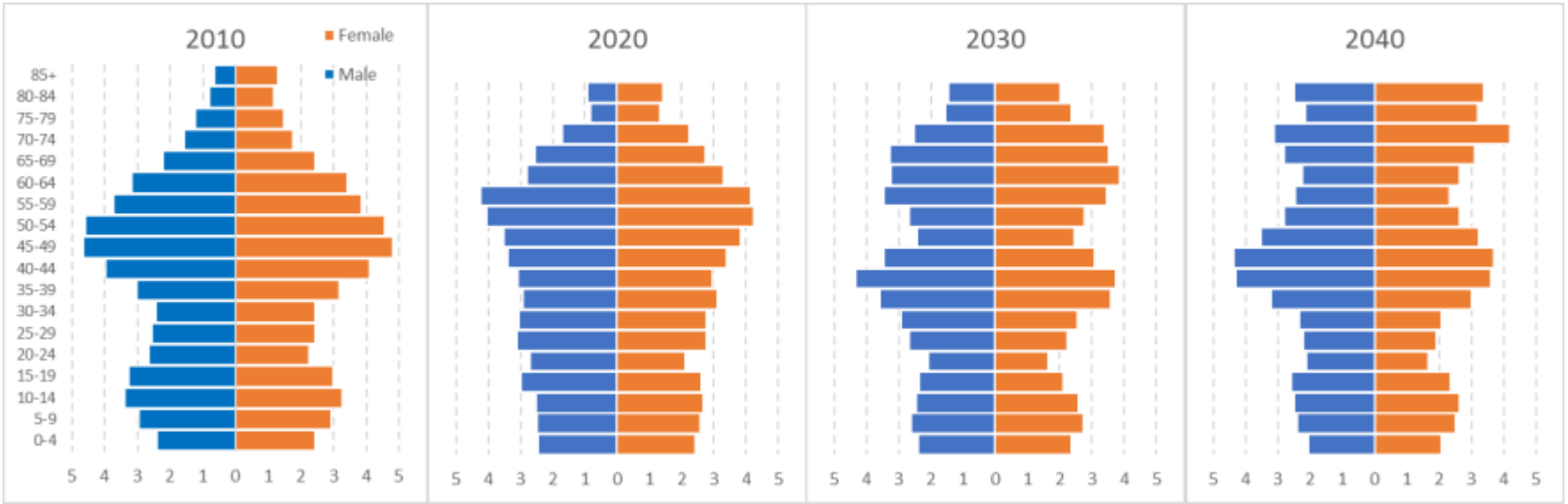
3 – From NH Employment Security 2014-2024 RPC 10 Year Projections, extended to 2040

4- Estimated from NH Employment Security Quarterly Employment & Wages, Bureau of Labor Statistics projections for labor force participation

5 – Based on NH Employment Security Quarterly Employment & Wages Data current regional unemployment rate of 3.49%

6 – Based on American Community Survey 5-Year Estimates

Figure 4-2: Age & Gender Cohorts 2010-2040 (Percent Share of each)



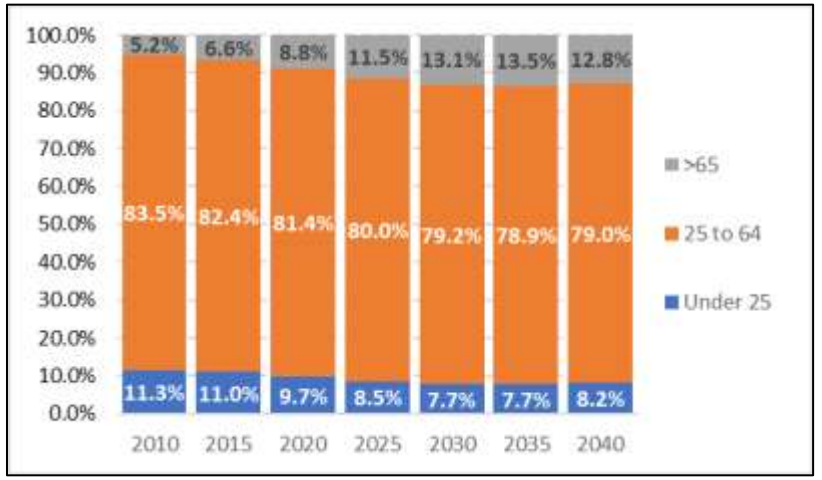
The slowing of migration, particularly of young people, into the state has brought the issue of the aging New Hampshire population to the forefront. While the state and nation as a whole are graying as the baby boom generation reaches retirement age, Rockingham County skews older than the state as a whole, due in part to significant development of age-restricted 55+ housing in the past two decades. AARP estimates that one in five Americans over age 65 does not drive, so in the transportation arena the needs of older residents and visitors may require a shift in the focus of investment to best serve that segment of the population, with increased attention to transit and paratransit, as well as safe pedestrian facilities (AARP Public Policy Institute, 2011). Also, as baby boomers age and children leave home there will be need for a broader range of housing options including smaller units requiring less maintenance and located in closer proximity to services.

Another aspect of changing demographics of the region is the growing ethnic and language diversity – particularly the growth in the region's Spanish-speaking population. This has implications for CART and other providers of transit service, to begin providing information on services in multiple languages.

Labor Force

Labor force size is calculated based on the current composition of the population by gender and five-year age cohorts using labor force participation rates from the Bureau of Labor Statistics (Toossi, 2015). The 2010 labor force is approximately 99,000 workers, of which about 46 percent are female and 54 percent are male. The bulk of the labor force is between 25 and 64 (83 percent). As the population ages and changes between now and 2040 it is expected there will be shifts in the labor force composition as well. Overall this means that the regional labor force will grow slightly until 2025 and then shrink back to 2015 levels as the aging "Baby Boomers" begin to enter skews in large numbers, and the cohorts of younger residents entering the labor force are smaller than those leaving it (***Figure 4-1, Row 3)***. At the same time, it is expected that there will be a substantial increase in the number of individuals aged 65 and older that remain in the labor force (***Figure 4-3***). This is offset by smaller groups in younger cohorts, and lower participation by the under 25 portion of the work force. While this demographic shift is important for many different reasons, it is used in this analysis only to help derive the overall size of the regional labor pool.

Figure 4-3: Age Distribution of the labor force to 2040



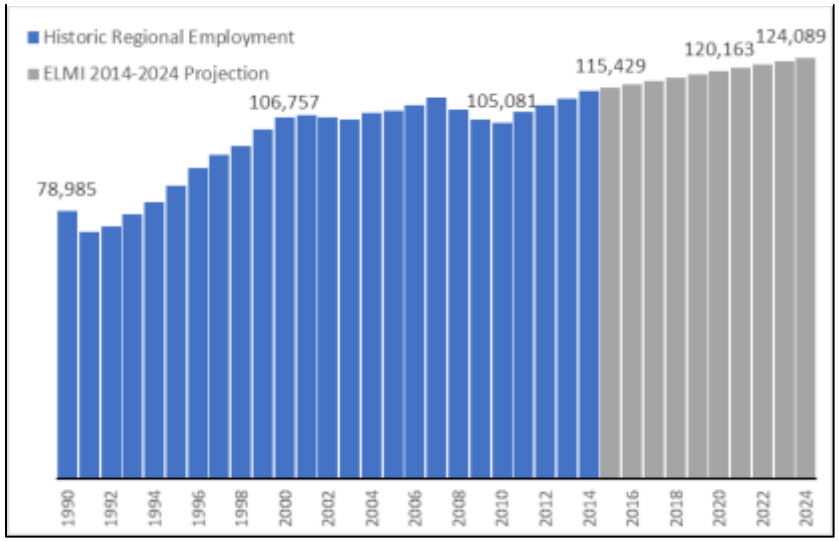
Commuting Patterns

Of the nearly 100,000 workers residing in the RPC region, it is assumed that 3.5 percent are currently unemployed based on recent employment data from NH Employment Security (NH Employment Security, 2016), and that for future years, the unemployment rate has stayed constant. The remaining labor force is split into those that work within the region (37 percent)

and those that work elsewhere (63 percent), based on Journey to Work data from the American Community Survey five year data (US Census Bureau, 2016). These commuters predominately arrive from Strafford County, Manchester, and Nashua regions of New Hampshire as well as from Southern Maine. For the purposes of this analysis, this distribution is assumed to remain constant at the 37/63 percent rate for all future scenarios.

Employment Projections

Figure 4-4: Historic Regional Employment and ELMI 2014-2024 Projections



Long-term (ten year) employment projections are developed on a biennial basis by the New Hampshire Department of Employment Security Economic and Labor Market Information Bureau (ELMI) for the state, counties, and regional planning commissions (ELMI, NHES, 2016) and are provided (categorized by industry). The latest set of projections available for the RPC region anticipates slow growth in overall employment (about 0.8 percent per year) between 2014 and 2024 (***Figure 4-4***) and adds approximately 9,000 jobs to the region. Extending this ten-year projection to the 2040 planning horizon of the Long Range Transportation Plan increases total employment in the region by approximately 25,700 jobs (See ***Figure 4-1*** for details) to just over 141,000. Individual industry growth rates were utilized at the regional level to tabulate employment increases (or decreases) for each. Employment was then distributed to each community based on the historic share of each industry. Industries were then summed to estimate total employment for each community and checked against available data for reasonableness. It should be noted that these are estimates of employment and should be considered as such as some data is not available at the community level and is inferred from regional totals or other information.

Scenario Planning

The Regional Master Plan update in 2014 included a scenario planning exercise that was intended as an initial effort at looking at potential regional futures and to provide a structure through which needs can be identified and options explored. It was not intended to cover all possible futures or to select a desired alternative, but instead, should be used as a tool to inform policy decisions at the local and regional levels and to consider how the amount and location of development in the region impacts the transportation system, housing and employment needs, as well as environmental resources. That being said, there are some conclusions that can be drawn from this effort.

The scenario planning effort was based on the differences in the population growth projections produced by the New Hampshire Office of Energy and Planning and the New Hampshire Regional Planning Commissions in late 2013, and the employment projections produced by the Department of Employment Security's Economic and Labor Market Information (ELMI)

Bureau. The population projections were predicting extremely low levels of growth in the region due to slowing migration into the region and demographic shifts such as the movement of the "Baby Boomer" generation into retirement and higher mortality cohorts. The ELMI employment projections, on the other hand, predicted a steady 1 percent growth per year in employment in the region, which, when extended out to 2040, added almost 40,000 jobs to the region. This created a theoretical disparity between the expected low population growth in the region and the labor force needed to fill the many jobs being vacated by retiring "Baby Boomers" as well as the predicted increase in employment. When combined with two potential land use distribution alternatives, the difference produced three scenarios that were compared to the baseline condition to gauge the impacts on the regional transportation system:

Slow Growth Scenario: A future of slow population growth is anticipated by the population projections and the work force and employment are sized to fit that slow change. Under this scenario, the population projections from OEP and the RPCs are utilized and employment growth is reduced to levels supported by the expected available labor force. In this scenario, there is little land use growth and so the distribution and amount stay generally the same as exists in the 2010 baseline.

Strong, Dispersed Growth Scenario: This concept moves towards the Regional Vision with strong population and economic growth. For this alternative NH Employment Security projections provide the employment growth rate and the population is increased to the point where the labor force is large enough to support the larger number of jobs. This scenario continues the current dispersed residential growth pattern with more rural communities growing faster than more urbanized ones. Employment is slowly diffused in some industry categories such as retail following current trends.

Strong, Concentrated Growth Scenario: The final alternative has similar population and employment as the dispersed growth scenario. It differs in that it concentrates residential growth into the largest employment centers in the region and further focuses employment growth in those same areas. These areas currently host just under 50 percent of the population in the region and 74 percent of the employment. To facilitate a change in distribution, 80 percent of the new population and 90 percent of new jobs are concentrated into the regional employment centers of Exeter, Hampton, Portsmouth/Newington, Salem, and Seabrook.

Scenario Planning Results

The Planning Commission utilized three different tools to examine the future scenarios. A regional buildout analysis examined changes from a land use perspective, the New Hampshire Econometric Model estimated economic impacts, and the MPO Regional Travel Demand Model calculated travel and transportation changes (Shown in ***Figure 4-5***). Each of these analyses was conducted independently but in a coordinated manner that allowed each to inform the others (Note: Raymond was not part of the RPC region at the time of this analysis and is not included in the results). The full analysis included in the Regional Master Plan is available on the RPC website. In most measures, the "low growth" scenario produces the smallest impacts on the transportation system with the lowest amount of delay and congestion. However, the economic implications of that scenario also indicate that it is not a desired future for the region. Some of those impacts by 2040 are:

- Overall lower employment than 2010
- Smaller work force than in 2010.
- The NH Econometric model suggests that there would be $4.2 billion per year less in the regional economy due to the smaller amount of employment in the region compared to the higher growth scenarios.
- $2.5 billion less in personal income in the region.
- Fewer jobs within a 15 minute commute than exists now in many communities.
- The two scenarios that measure substantial growth were not compared directly in the econometric model as it looks at the level of economic activity at a regional level and not the geographic distribution within the region.
- However, the concentrated population and employment pattern results in the best outcomes in terms of efficient use of land and the transportation system as modelled in the Regional Buildout and the Regional Travel Demand Model, and are supported by comparing the model results shown in ***Figure 4-5***.
- The concentrated development scenario fits generally within densities and development levels allowed by current zoning standards in the region. The concentrated development scenario produces population and population densities in both the regional employment centers and in all other communities that are higher than they are today.
- The concentrated development scenario shows modest growth in the more rural communities which allows them to better maintain their character without sacrificing economic growth.
- Focusing 90 percent of all new employment into the five employment centers increases the share of regional employment that those areas have by only four percent (74 to 78 percent).
- Focusing 80 percent of the new residential growth to the employment centers substantially increases the share of population that those communities have from 49.5 percent to almost 60 percent. This may have further benefits for the region from expanded services and economies of scale.
- Benefits of concentrated employment and housing as compared to a dispersed growth pattern:
  - Fewer Vehicle Miles of Travel (VMT) overall.
  - Decreased VMT on a per capita basis
  - Shorter trips of all purposes in both time and distance
  - Increased numbers of non-motorized trips
  - Less congestion and delay during peak hours

Future efforts will integrate the updated population and employment projections used as the basis for scenarios. In addition, the MPO is working to refine the tools available for the region, primarily the buildout model and regional travel demand model, to enable a more complete understanding of what different alternative growth scenarios imply for change. An expanded set of metrics will be utilized to better translate the results of the models into applicable measures and a more dynamic land use allocation modelling effort will be undertaken.

Figure 4-5: Transportation Network Statistics from Scenario Planning Exercise

Measure	2010 Baseline	2040 Slow Growth	*Change from 2010*	2040 Dispersed Growth	*Change from 2010*	2040 Nodal Growth	*Change from 2010*	*Nodal vs. Dispersed Growth*[1]
Daily Vehicle Miles of Travel (VMT)	6,374,567	6,681,490	*4.8%*	8,590,876	*34.8%*	8,525,502	*33.7%*	*-0.8%*
Daily Per Capita VMT (mi)	36.2	34.6	*-4.4%*	36.8	*1.7%*	36.5	*1.0%*	*-0.8%*
Home-Work Ave Trip Time (min)	28.4	34.6	*22.1%*	32.9	*16.1%*	31.0	*9.1%*	*-5.8%*
Home-Work Trip Ave Length (mi)	11.8	12.6	*6.8%*	12.0	*1.6%*	11.7	*-0.9%*	*-2.5%*
Home-Shopping Trip Time	14.2	15.2	*6.7%*	17.2	*20.7%*	15.9	*12.1%*	*-7.6%*
Home-Shopping Ave Length	5.7	5.7	*-0.2%*	6.1	*7.4%*	5.8	*3.0%*	*-4.9%*
Home-Other Ave Time	13.8	18.0	*30.2%*	17.8	*29.3%*	16.2	*17.1%*	*-9.0%*
Home-Other Ave Length	5.9	6.6	*11.9%*	6.5	*9.6%*	6.1	*3.4%*	*-6.2%*
Non-Home Based Ave Trip Time	8.1	9.1	*11.2%*	8.7	*6.3%*	8.3	*1.8%*	*-4.6%*
Non-Home Based Ave Length	3.9	4.0	*2.6%*	3.8	*-2.3%*	3.7	*-5.4%*	*-2.6%*
AM VMT	497,610	520,026	*8.4%*	665,645	*38.8%*	658,755	*37.4%*	*-1.0%*
AM VMT with V/C>.80	118,110	156,523	*32.5%*	283,056	*139.7%*	278,207	*135.5%*	*-1.7%*
AM VMT with V/C>1.2	50,393	56,271	*11.7%*	129,199	*156.4%*	119,010	*136.2%*	*-7.9%*
AM Delay (hours)	14,504	16,294	*12.3%*	51,167	*252.8%*	49,680	*242.5%*	*-2.9%*
PM VMT	631,378	666,551	*5.6%*	894,408	*41.7%*	889,937	*41.0%*	*-0.5%*
PM VMT with V/C>.8	294,579	304,753	*3.5%*	296,056	*0.5%*	292,040	*-0.9%*	*-1.4%*
PM VMT with V/C>1.2	91,664	99,116	*8.1%*	405,992	*342.9%*	396,909	*333.0%*	*-2.2%*
PM Delay (hours)	24,490	25,247	*3.1%*	107,094	*337.3%*	105,970	*332.7%*	*-1.0%*

NEEDS ASSESSMENT

The needs assessment for the Long Range Transportation Plan examines the existing conditions of the region described in ***Chapter 3***, as well as the current trends and expected future conditions described earlier in this chapter and identifies areas where transportation solutions are needed. These solutions can be in the form of specific projects or broader policy statements. The needs assessment is organized around the regional goals detailed in ***Chapter 2***.

MOBILITY NEEDS

Goal 1 - Mobility

The region's transportation system offers safe, secure, efficient, and reliable access to employment, housing, commerce, services, entertainment, and recreation

Mobility generally refers to the ability and ease with which individuals and goods can move from place to place. This is most often measured at the regional scale in Vehicle Miles of Travel (VMT) for automobile traffic, passenger miles of travel for transit, or in ton-miles for freight and needs are most often identified by examining areas of congestion where traffic and travel are greater than the capacity to support that level of activity.

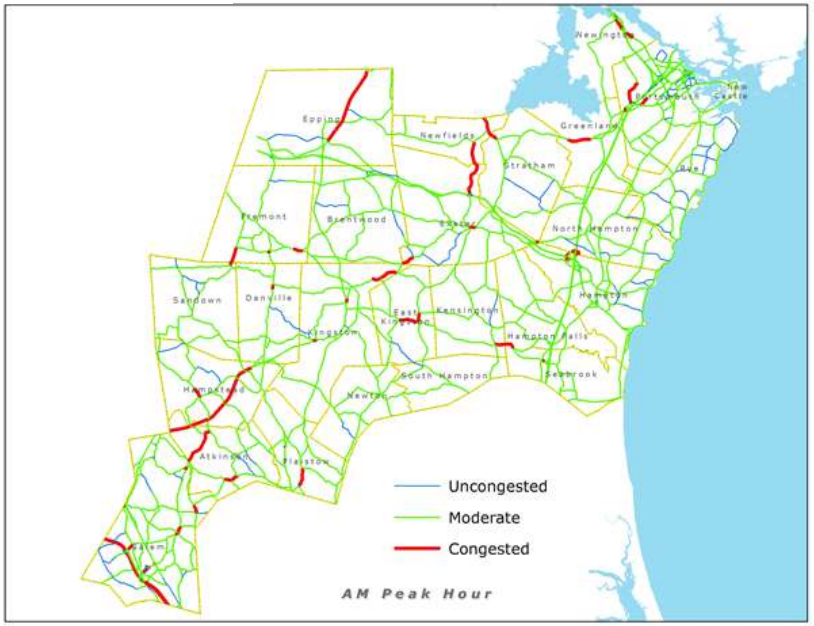
Congestion

The primary tools utilized to identify areas of expected future highway congestion in the region are the Regional Travel Demand Model and travel time date from the National Performance Management Research Data Set (NPMRDS). The model utilizes expected population and employment growth and distribution to estimate traffic volume and distribution of traffic moving through the region. This provides the capacity to identify the roadways that are approaching capacity during peak hour travel periods, and, if provided with different population values and distributions, estimate the impacts of differing land use scenarios on travel in the region. As part of the scenario planning exercise related to the development of the LRTP, the model was provided with three different distributions of population and employment utilizing the base year (2010) transportation network to estimate future capacity needs in the region.

The model outputs indicate that there is substantial overlap between scenarios in terms of "congested" segments of roadway. For the most part, the roadways that are congested under one scenario are congested under all with some variance in the amount of congestion. Figure 4-5 shows the transportation network statistics from the 2010 baseline and all three future development scenarios. Overall, results indicate that the concentrated development pattern provides significant efficiency gains compared to the dispersed pattern. Shorter automobile trip lengths and times are seen for all trip purposes when compared to the dispersed development scenario indicating that more desired destinations are closer to where people live when land use is more concentrated into urban centers. Vehicle Miles of Travel statistics help to support that notion, as travel under congested conditions is decreased both in volume and in hours of delay during both the morning and evening peak periods when comparing the concentrated pattern to the dispersed pattern.

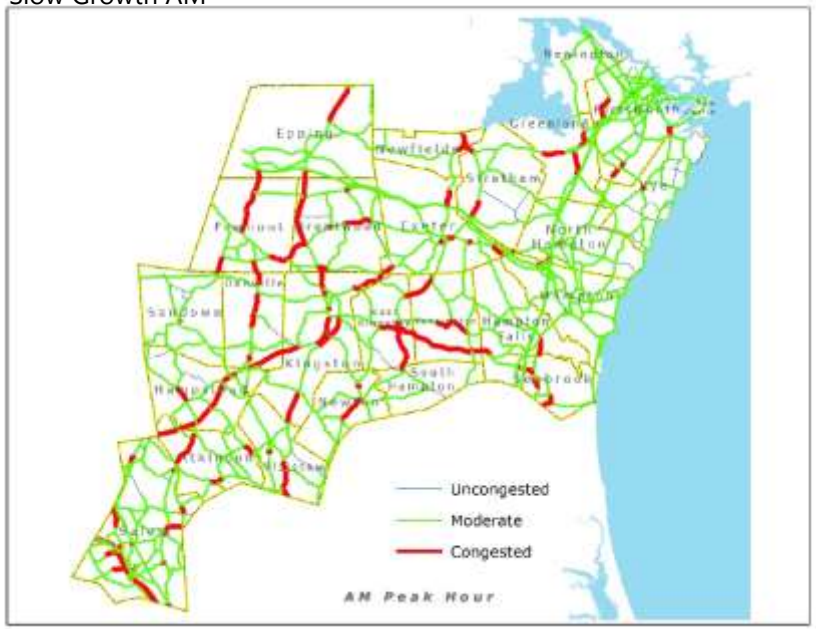
Maps showing congestion on the regional roadways indicate that despite efficiency gains, the concentrated growth pattern does not substantially change the location or magnitude of congestion compared to the dispersed development pattern.

Base Year AM



Dispersed Growth AM

Slow Growth AM

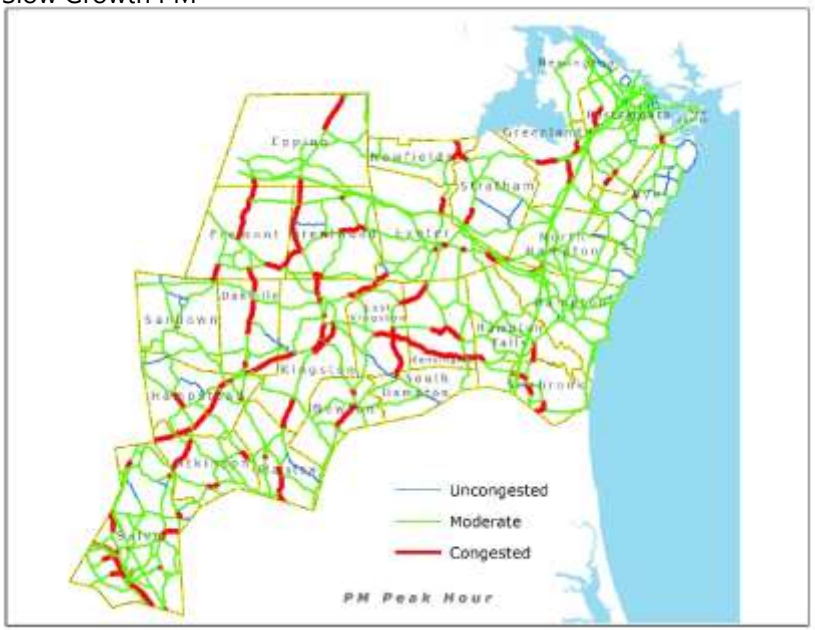


Concentrated Growth AM

Base Year PM

Dispersed Growth PM

Slow Growth PM



Concentrated Growth PM

Figure 4-6 shows the baseline conditions of congestion during the AM and compares them to the 2040 condition under each of the scenarios classifying roads as "Uncongested", "Moderately Congested", or "Congested" based on the volume to capacity ratio as modeled. ***Figure 4-7*** shows the same information for the PM peak period. Each of the future year scenarios shows an increase in congested driving over the base year of the analysis. During the AM peak period, the slow growth scenario shows a greater number of congested roadways in the center and western portion of the region, specifically on NH 107, NH 111, and NH 125. The Concentrated Growth scenario shows the least number of congested roadways while the Dispersed Growth pattern is somewhere in between. In the PM peak period congestion is more widespread in the baseline condition and each of the future year scenarios adds to that, especially in the number of "moderately congested" roadways. Both of the stronger growth scenarios show substantially more PM peak period congestion than the slow growth model however they differ somewhat in the distribution of that congestion.

The Dispersed land use pattern scenario indicates congestion spread along the length of most major highways in the region while the Concentrated development pattern indicates slightly less widespread traffic disruption. In both stronger growth patterns congestion is prevalent during the PM peak period on I-95, US 1, NH 28, NH 33, NH 107, NH 108, NH 111, NH 125, and several other routes.

The differences between the growth scenarios in terms of impacts on congestion may be understated as the model currently relies on static transit routes and proportions of non-motorized trips. This does not allow the model to adapt to stronger demand for transit by adding new routes without them being coded into the system, nor does it adapt to more concentrated development by increasing the percentage of non-motorized trips. Future efforts in scenario planning will investigate the impacts of additional transit routes and increased non-motorized trip percentages for more densely settled areas.

A number of roadways were identified as "congested" from the results of the travel demand model and many of these results are supported by current experience traveling these highways during peak hours. Congested routes in the 2040 Network (from the travel demand model):

- NH 111 in Hampstead, Atkinson, and Salem
- NH 125 in Plaistow, Kingston, and Epping
- NH 28 North of Main Street in Salem
- US 1 in Seabrook, Hampton Falls, Hampton, North Hampton, Rye, and Portsmouth (Ten Year Plan projects in Seabrook, Hampton Falls, and Portsmouth are not accounted for and may address some of this)
- NH 33 in Greenland and Stratham
- Pease Tradeport Access Roads
- NH 107 From Seabrook to Kingston
- I-95 (entire length)
- I-93 (Entire length)
- NH 108 in Stratham and Newfields
- NH 1A in Portsmouth and Rye
- NH 101 Interchanges and adjacent roadway connections

There are multiple capacity improvement projects that are currently underway, are in design, or are in the State Ten Year Plan that will address the congestion seen at some of these locations:

- *NH 125 Plaistow-Kingston*: Construction is wrapping up on the expansion of the roadway to 5-lanes between East Road and Old County Road in Plaistow. Additional work is scheduled in the State Ten Year Plan for between Old County Road and Hunt Road/Newton Junction Road in Kingston.
- *NH 125 in Plaistow*: A signal coordination/improved signal control project is in the State Ten Year Plan.
- *NH125 in Epping*: A signal coordination/improved signal control project is in the State Ten Year Plan as well as a project to implement capacity improvements between NH 27 and NH 87.
- *Salem to Manchester I-93 Widening*: The model accounts for only three lanes in each direction and does not include NHDOT's announced plans to pave four lanes in each direction.
- *Newington-Dover Spaulding Turnpike Expansion*: Expanded capacity between Exits 2 and 6, and new interchanges will ease congestion on that route.
- *US Route 1 Seabrook*: Construction is nearly complete on a project that will create a consistent 5-lane cross-section between NH 107 and Lake Shore Drive.
- *US Route 1 Hampton Falls*: A planning study begins in 2018 to begin to address the capacity constraints on US 1 through town.
- *US Route 1 Portsmouth*: State Ten Year Plan includes a project to create a consistent 5-lane cross-section between Ocean Road and Peverly Hill Road.
- *NH 28 in Salem*: Project is scheduled at the intersection of NH 28 and NH 97 (Salem Depot) to expand the capacity and reduce congestion.

While these projects will address some of the congestion issues seen in the model results, there are still some significant areas that require attention. Some of these locations (US 1, Much of NH 125) have benefited from corridor studies and other plans that have defined the projects necessary to meet the capacity and other needs along the corridor (See ***Chapter 5*** for the full project listing), while others are still awaiting a comprehensive look at the transportation improvement needs. The MPO has identified several areas that are in need of corridor studies to systematically address congestion, safety, and other transportation needs:

- *NH 108/33 corridor between Exeter and Portsmouth*: Growing Populations in the towns along this corridor as well as the growing popularity of the route as an alternative to get to employment at the Pease Tradeport and Portsmouth have increased traffic volumes and safety concerns.
- *NH 111 between Kingston and Salem*: This corridor has experienced significant land use growth that has increased traffic volumes, generated safety concerns and requests for intersection signals along the corridor.
- *NH 101 Interchanges between Raymond and Hampton*: Traffic volumes have doubled on this route since the expansion of the roadway to a two-lane grade separated facility was completed in 2001. Many of the interchanges, specifically those without traffic signal control are experiencing substantial peak-hour congestion for some movements.
- *NH 125*: Corridor studies have been completed from Plaistow to Rochester however there was a gap between the northern NH 111 intersection in Kingston through Brentwood, and to NH 101 in Epping. This area was slated for a corridor study in the late 2000s however funding was unavailable and so no comprehensive look at that part of the roadway has occurred.

ACCESSIBILITY & TRANSPORTATION CHOICE NEEDS

Goal 2 – Transportation Choices

The region's transportation system offers equitable and reliable multi-modal transportation choices to better connect people to jobs and services.

Accessibility refers to a traveler's ability to reach desired goods, services, activities and destinations. Accessibility in the MPO region is excellent for individuals with a motor vehicle. In contrast accessibility is very limited in much of the region for senior citizens, individuals with disabilities or other residents who lack a private motor vehicle or who are otherwise unable to drive to get to work, perform errands, or travel for other reasons.

For the region's growing senior population, access to transportation for medical care, grocery shopping or other basic life needs can make the difference between being able to live independently or enter long term care. On the other end of the age spectrum, national data show the Millennial generation gravitating to communities where access to work, services and entertainment isn't wholly dependent on auto ownership. Improving accessibility in the region will become increasingly important over the period covered by this plan given this changing makeup of the region's population.

This problem is less acute in communities served by public transit, or communities like Exeter or Portsmouth where residential neighborhoods are situated close to employment centers and services and walking or bicycling is a viable choice for many trips. Needs in the region associated with transit access and bicycle and pedestrian access are described below.

Transit

The development of the CART system in the Salem-Derry area, the expansion of volunteer driver programs like TASC and Ready Rides in the Seacoast and the expansion of transit along the Spaulding Turnpike and I-93 corridors have done much to improve accessibility in the region in the past decade. Still there is only limited transit access to major employment centers such as Exeter and Salem, and none to Plaistow and Hampton. The region benefits from inter-city commuter bus service on I-95 and I-93, though these are focused on Boston commutes and don't serve employment centers in northern Massachusetts or typical employment schedules in New Hampshire. A third of the region lacks even basic transit or volunteer driver program access for seniors and individuals with disabilities. Key transit accessibility improvements needed in the region include:

- Access in underserved communities - Basic daily community transportation access for seniors and individuals with disabilities is absent in the communities including Fremont, Brentwood, Epping, Kingston, East Kingston, Plaistow and Raymond. These communities currently receive one day per week service through Lamprey Healthcare, but are not covered by any regional volunteer driver program such as TASC, Salem Caregivers, Derry Caregivers, or Ready Rides.

- Continuing I-93 & Spaulding Turnpike Commuter Services - Boston Express commuter bus service on I-93 and COAST and UNH Wildcat Transit service on the Spaulding Turnpike have been supported by mitigation funding for those two major

highway projects. As those projects conclude new sources of funding will be needed to support the services. FTA funding through the Boston Urbanized Area (UZA) is available to support the I-93 services on an ongoing basis. There is not currently adequate FTA funding through the Portsmouth and Dover-Rochester UZAs to support expanded commute hour service on the Spaulding Turnpike on an ongoing basis. Flexing Surface Transportation Block Grant Program may be an option for ongoing support after 2020.

- Capacity at Park & Ride facilities on I-95 corridor - The Portsmouth Transportation Center (PTC) is at or above capacity even with recent incremental expansions. An intermodal center at the interchange of US1 and NH101 in Hampton was found to not be acceptable to the community. Siting for such a facility closer to Exit 2 may not be feasible. Proposed expansion at Exit 57 in Newburyport will help with demand from southern Seacoast communities, but less so the Greater Portsmouth area. Demand management through pricing parking at the PTC can also partially address this need, while generating revenue for facility maintenance and actual transit service.

- Employment transportation options – While fixed route service is difficult to sustain in low-population density areas of the RPC region, there appears to be potential for expanded commuter transit serving certain concentrations of employment such as Pease Tradeport and areas of Salem.

  Partnerships would likely be needed with specific employers to make service viable, similar to COAST's Clipper Connection service. An expansion of the COAST Clipper Connection commuter service to points south and west of Portsmouth Naval Shipyard and Pease Tradeport would an example of this (Epping, Exeter, Hampton).

- Inter-regional connections – The failure of the pilot East-West Express transit service has for the time being eliminated calls for a transit connection between the Seacoast and the I-93 corridor. For the CART service area there is strong interest in creating regular transit connections between the Greater Derry-Salem area, Manchester, Nashua and northern Massachusetts.

- Downeaster Improvements – Inadequate parking capacity at the Exeter train station continues to be a limiting factor for train access. Addressing this is a need not just for host community Exeter, but the broader catchment area towns from which riders are drawn. and support NNEPRA work to increase service frequency to 6-7 daily round trips between Portland and Boston from the current five daily round trips.

- Transit funding (non-Federal) – Funding for regional transit service is a perennial challenge in New Hampshire. This is especially the case for non-federal funding required to access FTA dollars. Addressing most of the needs described above will require development of new sources of non-federal revenue at the state level, whether from the General Fund, parking revenues at state-owned park and ride facilities, or other sources.

- Expand transit funding (Federal) – Public transit agencies in New Hampshire are also increasingly fully programmed with their FTA formula dollars. This applies to COAST as well as Nashua Transit System, and soon CART. This highlights the importance of access to Congestion Mitigation/Air Quality

(CMAQ) or flexed funds from other FHWA programs for vehicle replacement.

Bicycle & Pedestrian Facilities & Program Needs

- Complete Streets Policy Development - The concept of Complete Streets, fundamentally, is that streets and roads are transportation facilities that need to be designed to safely accommodate all travelers – whether driving a motor vehicle, walking, waiting for a bus or riding a bicycle. Nationally 28 states have adopted Complete Streets policies, including all five of the other New England states. More than 700 county and municipal governments nationally have adopted such policies, including Portsmouth, Concord, Keene and Dover in New Hampshire. A Complete Streets policy is not a one size fits all mandate. It is more of a process than a prescription, ensuring that safety needs of all potential users are considered from the beginning of the design process. Needs will vary greatly between urban and rural communities. The Regional Master Plan calls for development of regional complete streets policies at the state, regional and local levels. A complete streets study committee established by the state Legislature in 2016 stopped short of calling for a statewide complete streets policy, but did direct NHDOT to revisit existing policies related to street design and establish an internal advisory committee.

- Data collection on bicycle and pedestrian traffic volumes – The lack of data on bicycle and pedestrian traffic volumes is a significant problem in building the case for facility investments, particularly as the project selection process shifts toward a greater emphasis on performance targets. In the past three years staff have increased collection of bike/ped traffic volume data, though mainly in association with specific projects (NH Coastal Byway, NH Seacoast Greenway, Portsmouth bike/ped monitoring program). Availability of Strava data presents the opportunity to track change over time on road segments where facility improvements are made, and also to prioritize projects likely to have the greatest impact on bike/ped safety.

- Improvements on identified regional bicycle and pedestrian routes – Long-standing regional priorities for improving specific on-road bicycle and pedestrian routes include:

  - U.S. Bike Route 1/NH Coastal Byway (NH1A & NH1B)
  - Great Bay Bicycle Loop (US4/NH108/ NH33/Pease TradePort)
  - Exeter-Hampton-North Hampton Loop (NH111/NH1A/NH27)

  Priority off-road routes include

  - NH Seacoast Greenway following the abandoned Hampton Branch rail line
  - Salem-Concord Bikeway following the abandoned Manchester-Lawrence rail line.

- Facilitate local Safe Routes to School initiatives – The Safe Routes to School program no longer has a dedicated pool of funding for infrastructure investments. However, funding remains available to communities for planning and other non-infrastructure work, and the 5Es structure of the program (Education, Encouragement, Engineering, Enforcement, Evaluation) remains an effective model for engaging parents, schools, police departments, public works departments and other community members. Bicycle and pedestrian facilities in school zones should continue to be a funding priority, and

funds pursued for SRTS planning and program start-ups in new communities.

- Signage and lane marking – Improving use of safety signage and lane markings can be a cost-effective approach to improving bicycle and pedestrian safety given limited resources for constructing new facilities. The NHDOT Bike/Ped Advisory Committee in 2016 completed a set of recommendations to the department related to lane striping and signage, including identifying opportunities for narrowing travel lanes to gain shoulder width and calm traffic, modifying striping tapers at intersections, use of shared lane markings (sharrows), and increased use of warning signage at crosswalks and hazard areas. Also, there is a potential role for the MPO in working with communities and NHDOT on scheduled highway resurfacing, and the opportunity that can present for adjusting striping to calm traffic and provide additional shoulder width.

- Maintenance of bicycle and pedestrian facilities – Unwillingness to accept maintenance responsibility for sidewalks or bicycle traffic markings on state highways contributes to bike/ped safety improvements not being made as part of highway improvement projects. NHDOT will generally offer to construct sidewalks as part of highway improvement projects, but state policy is to not maintain bicycle and pedestrian facilities on state highways, on the basis that these are mainly for local rather than regional use. NHDOT's policy not to handle winter maintenance on sidewalks is understandable, given the impracticality of transporting a sidewalk plow to clear short segments of sidewalk. However, general maintenance of sidewalks, pedestrian crossing signals, and pavement markings that are integral to state highways should be handled by the same entity that covers of the highway itself – whether NHDOT or an urban compact community.

Transportation Demand Management

- Continue commuteSMARTSeacoast TMA following end of Newington-Dover project subsidy – The commuteSMART-Seacoast program has exceeded projections with its success in facilitating ridematching and promoting transit, bicycling and walking as commuting options for employees at Pease, PNSY and elsewhere in the Seacoast. In so doing it has reduced single occupant vehicle trips on the Spaulding Turnpike. The TMA has also served as an effective marketing arm for COAST. Current funding runs out in 2019 following completion of the Little Bay Bridges project.

- Evaluate TMA potential along southern I93 Corridor – The Town of Salem previously attempted to establish a transportation management association (TMA) among major employers in Salem as part of their Salem Employment Trip Reduction Integration Program (SE-TRIP) CMAQ project. While the original outreach for this effort did not turn up significant employer interest, the tightened labor market and challenges in hiring may make timing good for a second attempt at this work.

Shared Mobility Services

The growth of shared mobility services such as ZipCar, Uber and Lyft has significantly changed travel demand in many cities nationally. Such services fill an important gap in mobility options in urban areas where short trip distances and robust transit,

bicycle and pedestrian networks allow most trips to be taken by these modes. Together with these other travel options, on-demand access to a carshare vehicle for weekend trips or hauling groceries can allow many urban households to avoid the considerable expense of owning, driving and parking a private automobile.

All three companies have a presence in southern New Hampshire, though are not yet major factors in the transportation system. ZipCar has several cars on the University of New Hampshire campus in Durham as well as at Dartmouth College in Hanover. Uber entered the New Hampshire market in 2015 and publicizes that it has over 500 drivers and 40,000 members statewide. Their advertised primary service area extends from Concord to Nashua and eastward to Durham and Portsmouth, along with the Upper Valley communities of Hanover and Lebanon. The company claims an average ride arrival time of 5-7 minutes, with business concentrated on weekends. Lyft entered the New Hampshire market in 2017 and doesn't publish the size of its driver pool or rider membership. (MUL 4/4/17)

Uber's entry in the New Hampshire market has not been without controversy. Portsmouth and Manchester have both passed ordinances requiring stricter background checks, commercial insurance coverage and local registration for drivers. However these ordinances were preempted by a new state law in 2016 (RSA 376-A) requiring simplified driver background checks. While the state law is viewed as unfair by livery companies that face stricter regulation, it clears the way for expansion of Uber and Lyft service in the region and elsewhere in New Hampshire. Service is likely to be concentrated in urban areas and college communities; but also potentially tourism areas attracting out of state visitors including areas of the Seacoast beyond Portsmouth, the lakes region and ski resorts.

These services are typically used mostly used by younger, tech-savvy travelers, but also have potential to broaden transportation options for seniors and individuals with disabilities. The services' current model of scheduling via smartphone is a barrier for many seniors, though not all. Moreover, Uber is reportedly experimenting with a call center in some markets to assist non-tech-savvy seniors with scheduling a ride. Regarding access for individuals with disabilities, these services are already well suited to ambulatory travelers with vision impairments. In larger cities Uber and Lyft are working to add wheelchair accessible vehicles to their fleet, and over time this will likely spread to smaller markets such as Portsmouth and elsewhere in the MPO region. Eventual integration of commercial shared mobility services into regional transit coordination efforts could expand capacity and possibly present cost savings. If regulatory issues can be worked out such coordination could also benefit public transit providers in implementing ADA paratransit service.

Autonomous Vehicles

Fully autonomous vehicles are already in field test operation in urban environments, and several companies have announced that they will begin selling fully automated vehicles to consumers in the next few years. Potential advantages are myriad and include improved safety with the removal of human error; reduced traffic congestion as automated vehicles are able to communicate with one another and move more efficiently on highways; improved mobility for individuals with disabilities or the elderly who cannot drive themselves; reduced city center parking need as autonomous vehicles could drop off passengers downtown then park themselves at satellite lots; and more productive use of commuting time as drivers become passengers free to read, catch

up on email or even sleep as their vehicles drive them to work. Some writers have even suggested autonomous vehicles will eventually eliminate the need for public transit (Keen, 2013).

The National Highway Traffic Safety Administration (NHTSA) has defined five levels of vehicle automation, ranging from Function-Specific Automation (Level 1) to Full Self Driving Automation (Level 5). Level 1 features such as cruise control have been available for years. Level 2 features such as adaptive cruise control with lane centering are available on higher-end cars currently. NHTSA's Level 3 covers features that would allow drivers to have hands off the wheel and foot off the accelerator much of the time, but still be available to resume control immediately. Level 4 vehicles can perform all driving functions under certain conditions, such as on limited access highways, but need driver control in other settings. Level 5 vehicles are fully autonomous on all road times and in all environmental conditions (NHTSA, 2013).

While fully autonomous vehicles will likely be available at the high end of the market in the next 2-3 years, realizing many of the benefits described above will be a slow process in suburban and rural areas that make up much of the MPO region. Many may not be seen until the out-years of this plan or even beyond its horizon year of 2040.

The central challenges to realizing the benefits described above are achieving affordability and then ubiquity. Affluent non-drivers will likely be able to benefit from fully autonomous vehicles by 2020 or soon after, but those benefits won't be realized by lower income groups (which make up most of the non-driving population) until autonomous vehicles become affordable and readily available on the pre-owned market.

Analyzing integration timelines for other such technological advances, the Victoria Transportation Policy Institute has projected that level of ubiquity likely in the 2040s or 2050s (VTPI, 2017). Having most if not all vehicles on the road be autonomous is also key to realizing some of the best safety and congestion mitigation benefits of automated vehicles, which assume all vehicles are able to communicate with one another to achieve optimal follow distances and driving speeds.

Development and deployment of autonomous vehicles are being driven by the private sector. Preparing the transportation network and local land use regulations for that deployment will be a public endeavor that will require careful planning and investment in the next two decades. One land-use benefit of an all-autonomous vehicle fleet include reduced need for downtown parking, and consequent availability for redevelopment of space currently devoted to parking. A potential challenge will be that if self-driving cars reduce the perceived time and cost of travel, the distances people are willing to commute to work will increase and encourage further sprawl development.

Identified Needs in Shared Mobility

- Pursue integration commercial shared mobility services such as Uber and Lyft with regional transit coordination efforts.
- A comprehensive assessment of planning issues related to autonomous vehicle implementation, including but not limited to changes to travel demand modeling and traffic impact analyses to account for autonomous vehicles; new infrastructure and road markings needed to support autonomous vehicles; new measures to discourage induced sprawl; and changes in parking provision.

System Preservation & Modernization Needs

Goal 3 – System Preservation & Modernization

The region's transportation system is maintained in good condition and the preservation and modernization needs of existing components are prioritized ahead of adding new highway capacity.

The identification of system preservation and modernization needs essentially consists of two components; bridges and culvert condition, and pavement condition.

Bridges & Culverts

Much of the system preservation and modernization discussion has centered on the aging bridges in the region and, in recent years, a number of the most critical and complicated facilities have been replaced or rehabilitated. The replacement of the Memorial Bridge over the Piscataqua River between Portsmouth and Kittery, ME completed in 2013, and the anticipated completion of the Sarah Mildred Long Bridge, also over the Piscataqua River between Portsmouth and Kittery, in the fall of 2017 address the two most complicated and expensive red list bridges in the region. Engineering is underway to replace the NH 1B New Castle-Rye bascule bridge with a fixed span beginning in late 2018, and planning is underway to rehabilitate the Neil Underwood bridge (also a bascule movable bridge) on NH 1A between Hampton and Seabrook beginning in a few years. Finally, the General Sullivan bridge which serves as a bicycle and pedestrian connection between Newington and Dover is in the planning stage as well. This bridge was initially intended to be rehabilitated as part of the Newington-Dover Spaulding Turnpike expansion but continued degradation of the structure has required a re-evaluation of what portions of that structure, if any, can be saved or if the bridge will need to be replaced in its entirety.

There are 13 municipal bridges and another 12 state owned bridges in the region that are on the Red List with structural deficiencies that need to be addressed. NHDOT has provided substantial resources to repair or replace deficient bridges statewide in recent years, and, in the RPC region at least progress is being made. In 2014 there were 34 state and municipal red list bridges in the region. Construction on three has been completed and two more are currently under construction. In addition, eight state owned bridges of the top fifty priorities for repair or replacement are in the MPO region and six of those eight are somewhere in the project development process and moving towards construction.

Starting in 2013, the RPC began assessing stream crossings (culverts and bridges) within the region to provide state agencies and municipalities with information to identify critical and hazardous crossings. The objectives of this project are to identify those stream crossings that may fail, particularly during major storm events; and to identify if a crossing is a barrier to aquatic organisms, fish and other wildlife movement. Knowing the condition of stream crossings can help guide municipalities prioritize those crossing most in need of retrofit or replacement. Results from this assessment can be incorporated into municipal and regional hazard mitigation plans, vulnerability assessments and site specific restoration and mitigation projects. As of August 2017 RPC has collected these data in all 27 municipalities in the RPC region and will be developing a regional stream crossing report in late 2017 once all analysis is complete.

Pavement Condition

NHDOT monitors state owned highways by collecting roadway surface conditions on a biennial basis and uses the data to implement its Pavement Management Strategy. The Pavement Management Strategy is based around the delineation of a tiered roadway network, making sustainable investments, and establishing funding priorities. In this strategy pavement preservation actions have the highest priority on all roadways as this is the most cost-effective method to address wear and tear. More intensive (and expensive) actions such as rehabilitations and reconstructions are implemented only on a case-by-case basis, and roadways in poor condition are instead addressed through more frequent application of paving to restore the facility to a minimum acceptable standard.

In terms of overall condition, approximately 49% of the state owned roadway mileage in the region is considered to be in "Good" condition as of 2016, up from 28% in 2014. On the opposite end of the scale, 19% of roadway mileage is in "Poor" or "Very Poor" condition which is down from 23% in 2014. This is largely due to the application of the current pavement strategy over the last four years and an infusion of additional state and federal funding dedicated to maintenance activities. Based on NHDOT's pavement strategy, much of the focus has been on addressing roadways on the National Highway System (NHS) which tend to be the heaviest traveled facilities, and as of 2016 81% of that mileage is considered to be in "Good" condition, while only 32% of the non-NHS mileage in the region is considered to be in "Good" condition. These represent substantial improvements from 59% and 11% in 2014 respectively, but indicate a growing gap between roads on and off the NHS.

Identified Needs in System Preservation and Modernization

- Continue to dedicate resources to reduce the number of Red List bridges in the region.
- Continue to work with NHDOT to ensure that bridge designs use materials promoting long lifespans and incorporate consideration for bicycle and pedestrian needs as well as the potential impacts of climate change.
- Continue to encourage the state and communities to provide adequate resources for bridge and culvert maintenance and retrofitting.
- Continue to maintain (at a minimum) the resources being dedicated to pavement preservation and reducing the miles of roadway in poor condition.
- Direct additional resources towards pavement maintenance activities on non-NHS roadways.
- Assess the functional classification and National Highway System status of roadways in the region to ensure that each is receiving the level of focus appropriate for the facilities function within the transportation system.

SAFETY AND SECURITY NEEDS

Goal 4 – Safety & Security

The region's transportation system is safe and secure for all users.

Two Sources of data provide input for safety related needs in the region; the "5 Percent Report" which lists the locations in the state with the highest number of crashes, and the State Crash Records Database which provides relatively detailed information regarding the types of crashes that are occurring, who tends to be

involved, and other details. In addition, the New Hampshire Strategic Highway Safety Plan provides guidance as to the areas that NHDOT and the New Hampshire Department of Safety will be focusing on to decrease the numbers surface transportation related crashes, as well as the number of fatalities and injuries from those crashes.

5% Report

The 5% report lists the crash locations in New Hampshire according to severity, splitting that list into four pieces; urban intersections, rural intersections, urban segments, rural segments. This region has nine urban intersections and one rural intersections in the top 5% shown in ***Figure 4-6***. One of those intersections was signalized in the last few years (NH 125/Middle Road Brentwood) and may drop of the list in future iterations. North Broadway/Main Street in Salem is scheduled for expansion in 2018 and that may address the safety issues seen there as well. The Route 111/Ermer Road in Salem and the NH 125/NH 155 Road intersection in Epping have both been recently proposed for Road Safety Audits to identify short and long term changes that could be implemented to improve safety at those locations.

The region has eleven roadway segments in the top 5% for urban areas, and one segments in the top 5% for rural areas shown in ***Figure 4-6***. Three links (US 1 in Seabrook, and I-93 NB and I-93 SB in Salem) have recently be reconstructed and may drop off this list in future iterations.

Strategic Highway Safety Plan

The New Hampshire Strategic Highway Safety Plan establishes a vision of zero traffic deaths on roadways in the state. This includes an interim goal of reducing fatalities and serious injuries by 50%

Figure 4-6: 5% Report Intersections in the RPC Region

Major Road	Minor Road	Subtype	City	Crashes	AADT	Rank
NH 125[1]	Middle Rd	4-leg minor-rd STOP	Brentwood	30	15000	12
NH 121	Main St	4-leg minor-rd STOP	Hampstead	38	7800	15
Main St	Main St	4-leg minor-rd STOP	Epping	46	5300	19
NH 125	Chandler Ave	3-leg minor-rd STOP	Plaistow	42	22000	20
NH 28[2]	Main St	4-leg signalized	Salem	75	22000	21
NH 121	Emerson Ave	4-leg minor-rd STOP	Hampstead	30	7800	27
Route 111	Ermer Rd	4-leg minor-rd STOP	Salem	29	16000	38
NH 27	Little River Rd	4-leg minor-rd STOP	Hampton	45	6650	41
Route 111	E Main St	4-leg signalized	Hampstead	60	11000	47
NH 125	NH 155	3-leg minor-rd STOP	Epping	21	11000	91[3]

1 – The intersection was recently signalized
2 – Improvements scheduled for FY18
3 – Top ranked rural intersection in NH

by 2030 through a combination of technological improvements for vehicles, traffic controls, and intelligent transportation systems, behavioral changes, and effective enforcement.

- Development of emphasis area action plans for addressing impaired and distracted driving, speeding, vehicle occupant protection, teen drivers, older drivers, crash locations, vulnerable roadway users, comprehensive safety data, and education and public outreach.
- Linking with other planning efforts to address challenges
- Develop a communications plan & educational programs.
- Target messaging to at-risk drivers combined with high-visibility enforcement.

Regional Crash Data

Current trends in traffic crashes in the region are showing a recent growth in the number and rate of crashes per 100 Million VMT

Figure 4-7: Percentage of operators cited with distracted driving as a contributing factor

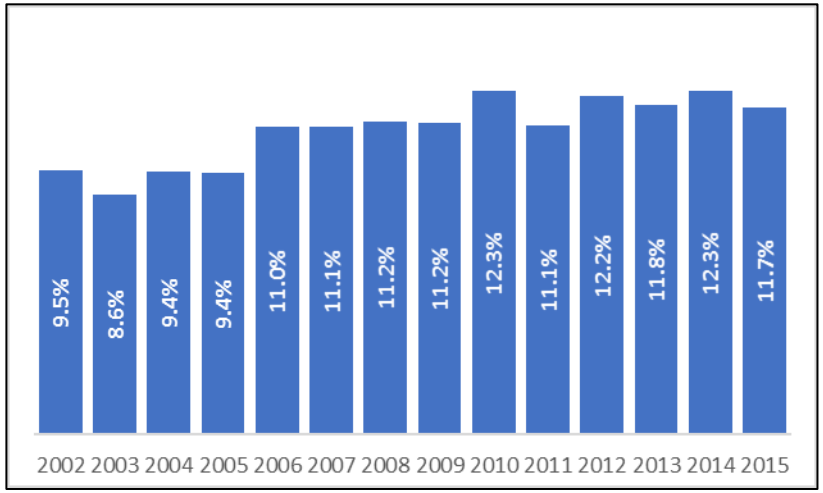
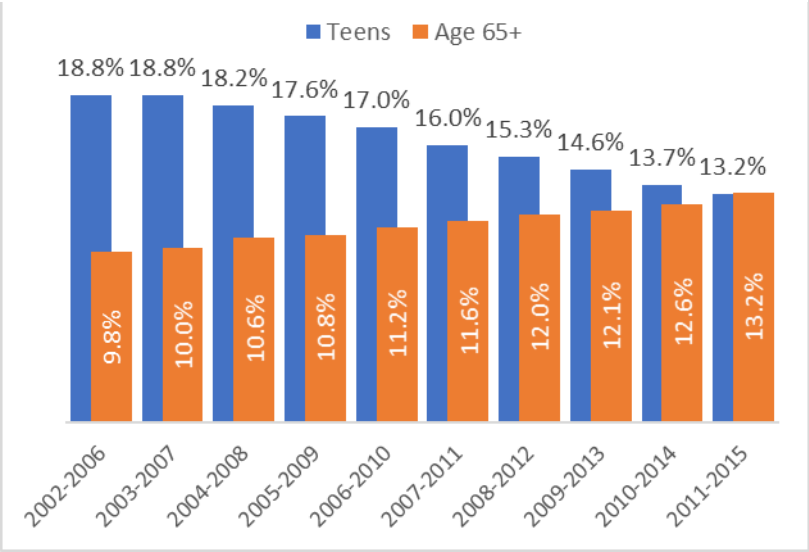


Figure 4-8: Teen and aged 65+ portion of operators involved in crashes with some causative factor *(distracted driving, failure to yield, etc.)*



(Refer to ***Figures 3-14 to 3-18*** in Chapter 3) after many years of decreases. The five-year average fatality rate over that time period has remained steadily around 0.71 deaths per 100 Million VMT however the rate of serious injuries has declined from 26.3 per 100 Million VMT in the 2002-2006 five-year period to 19.1 per 100 Million VMT in the 2011-2015 period.

Between 2002 and 2015 there were nearly 80,000 automobile related crashes that occurred within the region involving over 141,000 vehicles, bicycles, and pedestrians. Over that same period, distracted driving was cited as an apparent contributing factor just over 15,300 times which averages to just under 11% of the units involved. The trend generally has shown increased instances of distracted driving being cited as a contributing factor over the last 15 years peaking in 2010 and 2014 at 12.3%.

The State of New Hampshire recognized distracted driving as a growing issue and in 2015 laws went into effect banning the use of handheld electronic devices while driving or temporarily halted in traffic. The percentage of motor vehicle operators involved in crashes where that was cited as a contributing factor declined in 2015, however additional data will be needed to determine if this is a continuing trend or not.

Another interesting trend has been the shift in the distribution of crashes involving teen drivers and individuals aged 65 and older. Examining five-year averages, in the 2002-2006 period, teen drivers made up 18.8% of all motor vehicle operators involved in a crash where there was some contributing factor. At the same time, those 65 and older made up 9.8% of those involved. By the 2011-2015 five-year period, teen involvement had declined to 13.2% and older drivers had increased to 13.2%. This can likely be traced back to improved driver's education, somewhat fewer teen drivers, and a growing number of older drivers.

Identified Safety Needs

Based on the information above and in Chapter 3, there are a number of safety needs that have been identified, and that can be addressed in the Long Range Transportation Plan:

- Work to improve accuracy of crash data
- Continue to work with NHDOT on Road Safety Audits and follow-up improvements for crash locations with fatalities and serious injuries.
- Continue efforts in developing corridor based crash rates and incorporating crash analysis into corridor studies.

LAND USE INTEGRATION NEEDS

Goal 5 – Land Use Integration

New commercial and residential development supports multiple modes of transportation and minimizes the need for expanding capacity of adjacent roads.

In recent years there has been increased interest in multiple communities in the MPO region in updating zoning regulations to encourage more compact mixed-use development in their town centers, while leaving open and rural areas for agriculture, recreation and other suitable uses. Providing for more diverse housing opportunities in close proximity to town centers, schools and employment centers increases accessibility by walking, bicycling or transit. It also boosts the vitality of downtowns as easier access supports increased patronage of downtown businesses. Stratham, Seabrook, Hampton Falls and Portsmouth have adopted form-based type zoning to achieve this result.

Other key components of what has been dubbed Smart Growth including siting community facilities close to town centers for efficiency and accessibility by all users; maximizing the use of existing developed lands and buildings through redevelopment; and otherwise guiding growth into areas with existing infrastructure and away from undeveloped areas.

Needs of an Aging Population

The projected growth in the senior population will have significant implications for land development and the transportation system. Many communities in the MPO region have

permitted elderly housing and 55+ housing in the past two decades, but typically those developments have been sited distant from grocery stores, medical facilities, public libraries other services. As many residents of these communities eventually age out of driving, this siting will become a problem as residents are not able to walk to needed destinations, and low density areas cannot be effectively served by regular public transit. Aside from age restricted developments, national data show retirees looking to downsize from the 3 and 4 bedroom homes in which they raised families to smaller more easily maintained 1-2 bedroom units with proximity to downtowns in which they can age in place independently. There is currently limited supply of this sort of smaller unit. It will be important in the coming years for communities to assess how they will need to develop in the next 10-15 years to become more Age Friendly; including housing mix and supply, walkability of downtowns, transit access, and community services. The AARP has developed national guidance for such community assessments, and the Southern NH Planning Commission is already piloting this work. A similar initiative is needed in the near future for the RPC MPO region.

Autonomous Vehicles & Land Use

Eventual integration of fully autonomous vehicles is likely to have significant land use implications. Key among these land allocation for parking. Self-driving vehicles are likely to reduce the need for downtown parking, as travelers can be dropped off and vehicles programmed to park at a remote location until needed. This could eventually free up land in downtowns for redevelopment, and create new demand for satellite parking facilities. Another potential implication is longer commute trips and sprawl, if autonomous vehicles reduce the perceived time and convenience cost of longer commutes.

Energy & Environment Needs

Goal 6 – Energy & Environment

The region's transportation system is proactive in protecting natural and historic resources; and is forward looking regarding energy use, energy efficiency and conversion to renewable energy sources

Stormwater Runoff, Impervious Surfaces and Water Quality:

Increasing rates of land use change in the region have had a direct impact on declining surface water quality. According to the New Hampshire Department of Environmental Services (NHDES), over 90 percent of water pollution in the region is caused or attributable to stormwater runoff. The main source of this runoff originates from impervious surfaces (e.g. parking lots, roads and rooftops) which have nearly doubled in the last twenty years. The best practices to preventing stormwater pollution are to minimize stormwater runoff and to protect areas adjacent to water ways with buffer areas.

The infrastructure that helps to move stormwater off roads, buildings and parking lots has traditionally been constructed to move water from these locations as quickly as possible and to direct it into waterways. This allows for little if any removal of pollutants or chance for water infiltration into the ground, and can increase the potential for erosion and flooding issues. Stormwater infrastructure is often considered forgotten infrastructure, as the cost to construct or maintain it is often incorporated into the construction and maintenance of roadways and parking lots. Maintaining and retrofitting stormwater infrastructure is critical in combating water pollution. This work will likely be expensive:

NHDES has estimated the RPC region's total stormwater infrastructure costs to be almost $37 million dollars. The cost of protecting water quality through maintaining stormwater infrastructure is directly tied to the Federal MS4 Stormwater Permit for municipalities. The MS4 Permit is intended to address and reduce stormwater pollution originating from municipally-owned facilities and land, including local roads. The NHDOT is require to address stormwater pollution via a similar permit.

With many roadways, both local and state, and parking lots being located near water the maintenancnce and treatment of these areas also has a direct impact on water quality and stormwater runoff. The sanding and salting of paved areas during winter month is directly attributable to the chloride and total suspended solids (TSS) levels in waterways, leading pollutants for both aquatic organisms and impacting drinking water sources. Currently, New Hampshire law incentivizes private property owners to reduce their salt use on parking lots by reducing liability through the Green Snow Pro program. NHDOT and municipalities have been working to reduce salt usage, particularly near water supplies, but are often expected to provide perfectly cleared pavement.

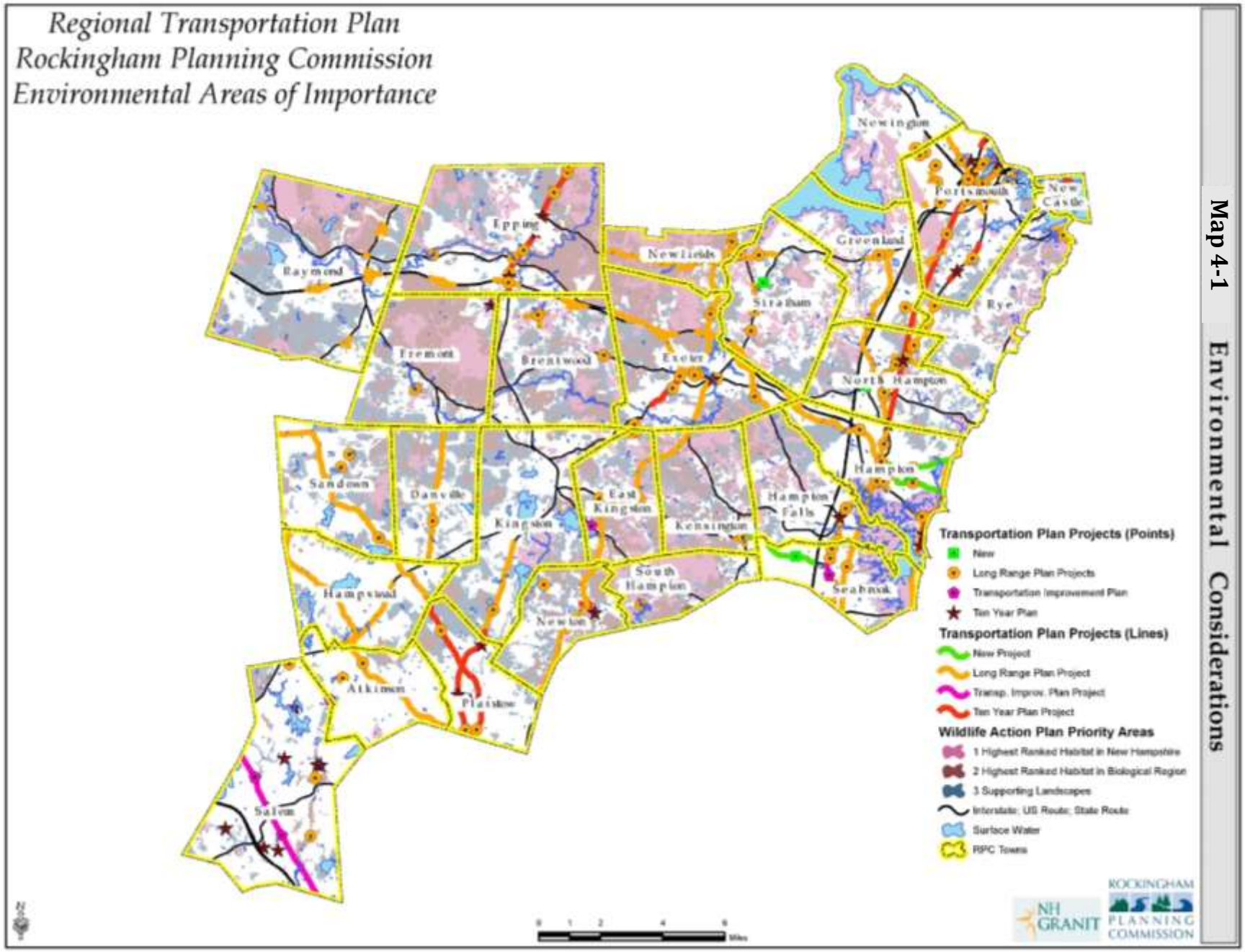
Groundwater is particularly impacted by increases in land use change and imperious surfaces specifically due to the change in recharge areas for precipitation to infiltrate into the ground. Increases in development, wider. In 2008, U.S. Geological Survey (USGS) released the Seacoast New Hampshire Groundwater Availability Study, an assessment to determine the long-term availability of groundwater in a region where groundwater is the primary source of drinking water. The overall finding, is that there are sufficient groundwater supplies to meet this growing demand in the RPC region. However, the land use and other policy decisions made at the state and municipal level could alter this scenario. Simply put, the more impervious surfaces allowed the greater the potential impact to water quality.

Wildlife, Habitat, and Open Space

In the RPC region there is a tremendous variety of wildlife and habitat types due to its unique position along the coast and the various types of wetlands, forests, grasslands and freshwater resources found within the region's boarders. Preserving large areas of forests and open space are critical for sustaining wildlife. Development of the natural landscape results in the loss of habitat and habitat fragmentation. Fragmentation reduces the quality of habitat by altering its size, shape and distribution, creating more "edge" and less "interior". The construction of new roads increases this fragmentation unless efforts are made to connect existing open spaces to protect critical lands.

As growth continues in the region, development is working its way into difficult areas, those with marginal soils, adjacent to wetlands and aquifers, and with other environmental constraints. It was often believed that these lands would remain open space because of the expense and difficulty to develop them. However, these marginal lands are now being developed, particularly in areas where water and services have been extended. For example, when roads cross streams and rivers the structures that allow the water pass under the road can often cause problems by changing the shape and structure of the stream, degrading aquatic habitat, disrupting water flows, and by restricting the movement of fish and other wildlife (NHDES, 2008).

Amongst RPC comminutes, several of the highest priorities identified in local master plans include protecting natural resources for water quality protection, recreation, open space,


Regional Transportation Plan
Rockingham Planning Commission
Environmental Areas of Importance
Map 4-1
Environmental Considerations
Newington
Portsmouth
New Castle
Greenland
Rye
Epping
Newfields
Raymond
Stratham
Fremont
Brentwood
Exeter
North Hampton
Hampton
Sandown
Danville
Kingston
East Kingston
Kensington
Hampton Falls
South Hampton
Seabrook
Hampstead
Newton
Atkinson
Plaistow
Salem
Transportation Plan Projects (Points)
New
Long Range Plan Projects
Transportation Improvement Plan
Ten Year Plan
Transportation Plan Projects (Lines)
New Project
Long Range Plan Project
Transp. Improv. Plan Project
Ten Year Plan Project
Wildlife Action Plan Priority Areas
1 Highest Ranked Habitat in New Hampshire
2 Highest Ranked Habitat in Biological Region
3 Supporting Landscapes
Interstate; US Route; State Route
Surface Water
RPC Towns
0 1 2 4 6
Miles
NH GRANIT
ROCKINGHAM PLANNING COMMISSION

and wildlife. Currently, only 14.8 percent of land in the RPC region is permanently protected and ranges greatly by community.

A number of planning efforts have occurred in the region and the state in recent years that can inform the transportation planning process and aid in understanding the impacts of projects on the natural environment. Several data sources for natural resources exist which can provide detailed information on the location, quality, and extent of discreet natural resource types as map "layers", such as wetlands, aquifers, forest areas by type, and soils. However, there are fewer sources which look at these resource layers in combination and assess the value of different geographical areas based on the presence, quality, and interaction of two or more of these resource layers based on their value as a functioning ecosystem.

Air Quality

After nearly 20 years as part of a Non-Attainment Area for the NAAQS, New Hampshire was designated as being in Attainment for NOx and VOCs in July, 2015. During that time as a Non-Attainment Area, many efforts were focused on reducing the impacts of the transportation system on air quality through projects and policies that reduce Vehicle Miles of Travel and promote less polluting modes of travel. While the region no longer needs to conduct Transportation Conformity and emissions analysis to demonstrate that the projects being constructed and implemented do not have a detrimental impact on air quality, air pollutants and greenhouse gas emissions remain a concern and a component of the over-arching RPC strategy for continuing to maintain and improve the air quality of the region.

Energy

Transportation is the highest energy use sector in New Hampshire, accounting for over 35 percent of total energy consumption in the state versus approximately 28 percent nationwide. The transportation sector also features heavy use of fossil fuels across all modes, accounting for about 70 percent of total U.S. oil consumption. While federal CAFÉ standards and technological advances have significantly improved average fuel economy over the past 40 years, low fuel prices have increased demand for trucks and sport utility vehicles and decreased demand for hybrid vehicles in recent years. Nationally hybrid vehicle sales peaked in 2013 at 3.2 percent market share, falling to 2.0 percent of new car sales by 2016. (PIRA Energy Group). These factors, along with the resumption of annual increases in total Vehicle Miles Traveled (VMT), raise concerns for air quality as well as efforts to reduce regional greenhouse gas emissions.

Statewide planning efforts in climate change and energy serve as guides for all regions of the state to work toward a more resilient and secure energy future. The New Hampshire Climate Action Plan (2009) and State Energy Strategy (2014) contain recommendations to guide collaborative efforts across multiple sectors, including transportation, towards common goals of energy efficiency. Specifically, the New Hampshire State Energy Strategy (2014) calls out the following needs for reducing energy consumption related to transportation:

- Promoting better fuel economy.
- Increasing use of electric and natural gas vehicles, including building out infrastructure to support these technologies for consumers and fleets.

- Increasing use of transportation options beyond the single occupant vehicle, including transit, ridesharing and active transportation.
- Implementing smart growth strategies to reduce VMT and efficiency.
- Exploring pricing programs to reduce VMT

Historic Resources

The MPO region is rich in American history, dating to its original European settlement in 1623; but also extending into pre-history with the earliest Native American sites dating back 9,000 years. Among these resources are buildings and sites that trace the history of not just individual towns or cities, but the State of New Hampshire and the nation as a whole. These resources help to define the character of our communities, and contribute to the region's quality of life and economic vitality.

The rapid growth and land development of the 1970s-1990s has changed somewhat in the past decade with demographic shifts and extensive planning and land conservation efforts; and the economic downturn of the late 2000s temporarily reduced or removed development pressure in many communities. While the region as a whole is not likely to see growth on the order of the 1980s again, development pressure has returned as the economy has rebounded from the Great Recession, and indeed it never really slowed in communities such as Portsmouth and Seabrook. As the supply of open land diminishes, there is also increasing emphasis on redevelopment in some communities, with implications for existing lower density historic development. More communities are facing up to the dilemma: how to allow for necessary growth while preserving traditional community character.

In the past twenty years municipalities in the Rockingham Planning Commission region have made strides in recognizing the value of their historical resources – buildings, structures, neighborhoods, and landscapes – and the role they play in economic development and a community's sense of itself. Seventeen of the twenty-six communities in the RPC region currently have Historic Resources chapters in their local master plans. An increasing number of communities have established Heritage Commissions to raise local awareness of the value of Historical resources and protect those resources. Local, regional and statewide initiatives in land conservation over the past decade have protected thousands of acres of environmentally and culturally valuable lands, and supported a resurgence of small scale farming as part of a nationwide local agriculture movement. Heritage tourism is an increasingly important component of the regional visitor industry, not just in communities with concentrations of high style buildings like Portsmouth and Exeter but in other communities that have banded together to designate Scenic Byways including the American Independence Byway, the NH Coastal Byway and the Robert Frost/Old Stage Coach Scenic Byway. Lastly, as communities have looked to manage sprawl there has been increasing recognition that contemporary models of compact, mixed use development draw largely on traditional New England village development patterns.

Data on historic resources tend to be less complete, as few municipalities have comprehensive and up to date historical and cultural resource inventories. Much of the cultural resource inventory data from the past 20 years has been compiled for limited geographic areas as part of regulatory requirements for permitting public infrastructure projects such as highways or utility lines. These data are compiled at the NH Division of Historic Resources, but most are not readily available to municipalities as they have never been digitized and made available through

GRANIT. RPC has digitized locations of all resources listed on the the State and National Registers of Historic Places, but this doesn't include resources identified through NEPA inventories as eligible for the Register but not listed. Making these data more readily available to municipalities and the MPO is a significant need, as is updating municipal resource inventories to capture resources that have become eligible for the National Register since many inventories were last updated in the 1980s.

RESILIENCY NEEDS

Goal 7 – Resiliency

The region's transportation system is adaptive and resilient to climate change and natural and other hazards.

New Hampshire's roadways and transportation infrastructure are highly susceptible to climate change impacts including increased precipitation, rising temperatures and rising seas. These changes in environmental conditions result in inland freshwater flooding, flooding from daily tides, pollution entering waterways and wetlands from increased stormwater runoff from roads and parking lots, impacts to pavement surfaces from extreme summer temperatures, and impacts to roadway subbases and pavement surfaces from rising groundwater levels.

New Hampshire and its municipalities have ample opportunities and time to prepare and adapt to a changing climate. This effort will require understanding of recent climate projections and assessments, applying technology and data to solve problems, and learning from other states and communities that have successfully implemented effective strategies and solutions.

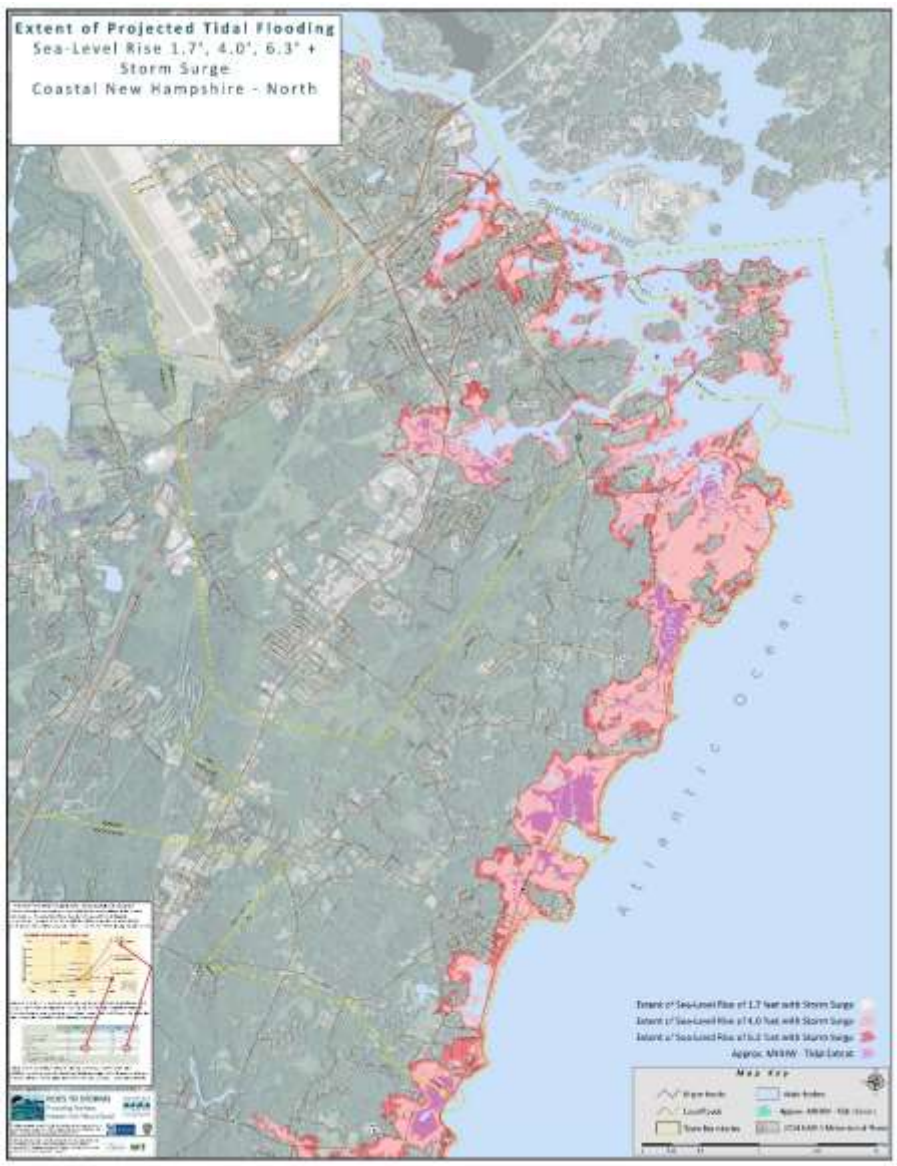
With respect to climate change, ***mitigation*** is the reduction of greenhouse gas (GHG) emissions achieved through energy efficiency and conservation, use of renewable and alternative energy sources, and CO_2 storage in forests and biomass.

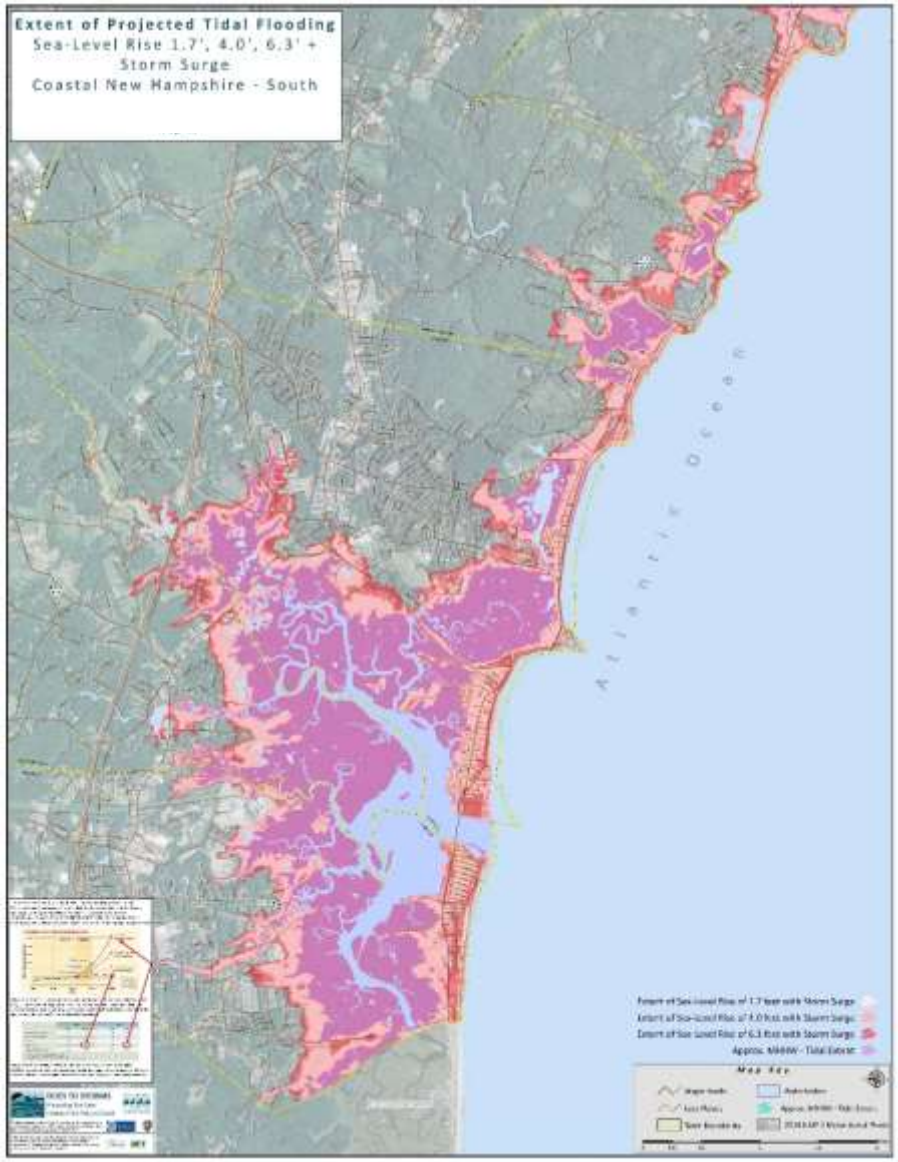
Incorporating the latest future projections of sea-level rise and storm flooding into municipal planning and projects will minimize vulnerability and prove beneficial even if future hazards turn out to be less extreme than anticipated. ***Adaptation*** to changing conditions means designing buildings and facilities that account for flooding or modifying uses of land that are compatible under a wide range of conditions. The process of adapting creates buildings and systems that are more ***resilient*** and better able to perform with fewer impacts.

Climate Change

Carbon dioxide (CO^2), a primary contributor to the problem of global climate change, is emitted through the combustion of fossil fuels and the concentration of this compound has increased substantially since the industrial revolution and continues to do so today (EPA, 2014). The transportation sector contributes roughly 28 percent of the total US greenhouse gas emissions each year and is an area where we can continue to make changes to reduce the impacts. Increased frequency and severity of storm events over the past decade, and anticipated continuation of this trend in the coming decades related to climate change, has significant implications for transportation system operations, maintenance and future investment planning. It is the responsibility of the MPO to identify the measures that are necessary to plan for a transportation system that is resistant to damage from extreme weather and more resilient when weather-

Map 4-2 - Coastal Inundation in Six Foot Sea Level Rise Scenario with 100-Year Storm (Tides to Storms Vulnerability Assessment)





related impacts do occur. The challenges that the MPO faces from this include:

- Development of the data necessary to estimate the vulnerability of the transportation system to increased storm activity and sea level rise.
- Finding the funding to address specific facilities that are vulnerable to sea level rise and increased storm activity.

Climate change can have a variety of impacts on the transportation system of the region and coastal areas are particularly vulnerable to those impacts. Higher temperatures can cause problems with softening pavement and expanding bridge joints creating stresses on the affected facilities. More intense storm activity results in more frequent flooding causing traffic problems as well as damage to roadways, culverts, railroads, and bridges. Coastal inundation from storm events brings the addition of damage from wave action and salt water.

RPC's Tides to Storms Vulnerability Assessment (2015) examines the impacts of flooding due to sea level rise and inundation from storm surge. This analysis found that under the highest expected sea level rise scenario, 100-year storm events (1 percent probability per year) will impact over 80 miles of roadway and bridges in the Seacoast. ***Map 4-2*** shows the extent of these impacts under that scenario. The impacts from this flooding are in many of the regionally significant economic centers along the coast and could have substantial negative effects on tourism and the economy of the region and work needs to continue to mitigate these issues before the problems occur.

Accommodating Future Conditions

Sea-Level Rise: Coastal Vulnerability Assessments

The Tides to Storms (RPC, 2015) and Climate Risk in the Seacoast (RPC and SRPC, 2017) Vulnerability Assessments evaluated impacts to the 17 coastal NH municipalities from sea-level rise of 1.4 feet, 4.0 feet and 6.3 feet, as well as these three scenarios plus storm surge. Affected critical facilities and infrastructure, transportation infrastructure, and natural resources were inventoried and mapped. Reports and maps are available on the RPC website at: http://www.rpc-nh.org/regional-community-planning/climate-change/resources.

These assessments document sections of state roadways, and their associated infrastructure, that are vulnerable to flooding from sea-level rise and storm surge at the year 2100. Roadways affected include Routes NH1A, NH1B, NH101, NH286, NH108, and NH16; US1 and US4; and I-95.

Rising Groundwater

Researchers at the University of New Hampshire have modeled the effects of rising groundwater and rising temperature on pavement condition and performance [Knott, 2017]. The Knott et al study (2017) evaluated several functional classifications of roadway to determine the magnitude of fatigue and rutting life reduction expected from four scenarios of sea level rise. All sites evaluated experienced service life reduction, the magnitude and timing of which depended on the current depth to groundwater, the pavement structure, and the subgrade. The report suggests the use of this assessment methodology will enable pavement engineers to target coastal road adaptation projects effectively.

Rising groundwater levels may also result in increases in freshwater wetlands throughout the Seacoast region which might influence the scale and complexity of permitting requirements for freshwater wetland, saltmarsh and riverine impacts related to expansion and modification of existing roadways and transportation infrastructure.

Rising Temperature

Researchers at the University of New Hampshire have modeled the effects of rising temperature on pavement condition and performance [Rajib, 2016]. The model results found a significant increase in deterioration of roads resulting from projected climate change-related temperature parameters compared to a 'no climate change' scenario. The model can be used to estimate the risk of negative impact of such change on pavement lifecycle and performance, and evaluate the effectiveness of various adaptation approaches.

Spatial Variability

Analysis of climate change impacts from sea-level rise must factor in the variability of water surface elevations and hydraulic dynamics resulting from rising sea levels along the Atlantic coast, tidal riverine systems and the Great Bay. The presence of saltmarsh and freshwater wetlands in tidally influenced areas may also effect the spatial extent of sea-level rise as these systems act as buffers that can store large amounts of water.

With respect to bridges, under certain scenarios bridge structures themselves may be situated above the projected elevation of rising sea levels but the lower lying approaches are inundated and highly susceptible to flooding even under the lowest sea-level rise scenarios.

Adaptation – adjustments in ecological, social, or economic systems in response to actual or expected climatic change and their effects or impacts. It refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change. [http://unfccc.int/focus/adaptation/items/6999.php]

Resilience - a capability to anticipate, prepare for, respond to, and recover from significant multi-hazard threats with minimum damage to social well-being, the economy, and the environment. [EPA http://epa.gov/climatechange/glossary.html]

With respect to culverts, coastal vulnerability assessments report that a number of existing freshwater culverts could be inundated by rising sea levels. These freshwater structures were designed for unidirectional flow, not to withstand bidirectional tidal flow and currents. In many instances the road surface elevation at these culvert locations is also susceptible to inundation. These culverts and road segments should be considered highly vulnerable infrastructure and prioritized for analysis and modifications.

Coastal vulnerability assessments recognize that modifications to state roadways to adapt them to sea-level rise impacts would also affect all connecting local roadways, driveways and other access points. Changes to surface elevation, orientation and location would need to factor in all of these other connection points. Close coordination with municipalities and affected property owners in high risk flood areas is necessary to plan transportation system modifications in the short-term and long-term to respond to changing conditions as sea levels rise.

Additional Considerations and Resources

Site Specific Analyses

Site specific analyses and modeling are necessary to quantify these various climate change impacts. For example, modeling groundwater rise can project future hydrologic conditions but those conditions will impact transportation assets and resources

in different ways and different degrees of severity based on factors such as: roadway and infrastructure location; roadway and infrastructure construction and design specifications; age of a roadway, culvert or bridge; and current condition and intensity of use of a roadway or infrastructure.

Planning and Environmental Linkages

With respect to Planning and Environmental linkages, future growth will further distribute roads and parking areas that serve development across the landscape, intensifying their secondary impacts such as increased impervious surfaces, increased stormwater runoff and nonpoint source pollution, water quality impairments, and habitat fragmentation. These growth-related impacts may be magnified particularly in rural areas of the region where thousands of acres of land have development potential and land use and environmental regulation are implemented primarily by local land use boards one municipality at a time. Careful consideration of cumulative impacts especially at the watershed scale are necessary to ensure future growth and development maintains high water quality, protects sensitive natural resources and habitats, and protects resources for public health and safety such as drinking water sources.

Technical Resources

The New Hampshire Coastal Adaptation Workgroup (NH CAW) is a collaboration of 24 organizations (state, regional, municipal, non-profit, academia, private sector) working to ensure coastal watershed communities are resourceful, ready and resilient to the impacts of extreme weather and long term climate change. The mission of the NH CAW is to assist communities in NH's coastal watershed to prepare for the impacts of extreme weather and long term climate change by providing resources, facilitation, and guidance that enhance readiness and resilience. NH CAW has successfully secured federal funds to support research, analysis, planning and outreach throughout the coastal watershed. Refer to the NH CAW website for more information at http://www.nhcaw.org/.

Economic Vitality Needs

Goal 8 – Economic Vitality

Through strategic investment, the region's transportation system supports an innovative and competitive 21st century economy that connects people, goods, and communities to desired activity and economic centers.

Continued economic success in the region will rely significantly on the quality of our infrastructure, including and especially our transportation network. Deferred investment in transportation infrastructure is shifting capital costs to the future and adding a cost burden on the economy going forward – either through loss of services from failed infrastructure or from higher fees and taxes required to restore it.

The Regional Economic Development Center for Southern New Hampshire (REDC) annually updates the Comprehensive Economic Development Strategy (CEDS) for a region that includes the 27 communities in the MPO region, the remaining ten towns in Rockingham County plus five communities in the Greater Nashua area. The CEDS essentially serves as the economic development master plan for the region. The 2017 CEDS emphasizes infrastructure investment, as well as regional cooperation, workforce attraction and retention, affordable housing and sustainable living (REDC, 2017)

The goals, implementation strategies and projects included here are largely consistent with the goals and objectives of the CEDS.

The proposals in this plan will benefit the region's economy by providing improved mobility through currently congested areas of the region, improving access to employment through transit development, improving freight flows, encouraging compact mixed-use development and pedestrian friendly downtowns, developing a regional trails system for residents and visitors alike, and improving safety for tourists and other travelers on key roadways in coastal tourism areas. Discussion and recommendations related to transit, compact mixed-use development and walkable communities are covered under Goals 2 & 3. Key aspects of the transportation system related to economic development, including the freight system and investments to support travel and tourism, are discussed below:

Freight

Goods movement continues to be a growing sector of travel in the region as well as an important aspect of the regional and national economy. The Freight Analysis Framework is predicting that overall freight movement will increase by 48 percent between 2011 and 2040. Overall the share of freight carried by truck has peaked and more goods will be shipped by all other modes. Truck freight currently carries about 82.5 percent of all goods by weight (KTons) but this is expected to decrease to 80.2 percent by 2040 with all other land based modes showing increased utilization. Between 2011 and 2040 the volume of Air freight is expected to increase by 195 percent, rail freight by 107 percent, and multimodal freight by 109 percent. The increased volume of freight being moved in the region brings with it a number of issues, concerns and needs.

- Intermodal freight infrastructure - The investment in rail, port, and connecting transportation infrastructure has been lower than may be needed to adequately manage the expected freight volumes. The replacement of the Sarah Mildred Long Bridge represents one major investment in the region's freight system as it improves shipping access at the Port of New Hampshire and addresses other operational needs at the Port. Double tracking the B&M main line through New Hampshire is another frequently cited need that would expand freight and passenger rail capacity. A less capital intensive but still important need is improving truck rest area facilities. The new NHDOT State Freight Plan will identify other strategic investments to improve the region's freight infrastructure. Completion of the Freight Plan is also key to maintaining access to FHWA funding specific to freight projects.
- Heavy truck damage to roadways - Longer, heavier trucks are damaging roadways that were not designed to manage current allowable weights and infrastructure not designed for the turning radii necessary for the longest trucks. New pricing strategies are needed to ensure trucks are contributing to the Highway Fund commensurate with their impact on the region's and state's roads and bridges.
- Hauling hazardous materials - Public concern has increased regarding the safety of moving hazardous materials through communities on rail and roadway. This underscores the important of public engagement in system planning and project programming.

Travel & Tourism

The FAST Act gives new attention to the role of the transportation system in supporting travel and tourism by adding a new national Planning Factor focused on this area. This is particularly appropriate for the MPO region, as coastal tourism is a major driver of our economy. In State fiscal year 2014 over 36.6 million visitors came to New Hampshire and directly spent approximately $4.95 billion dollars. With secondary impacts in supply industries and travel industry worker spending the Institute for New Hampshire Studies at Plymouth State University estimates total contribution of tourism to the state's economy at $15.2 billion. The Seacoast region generates the largest share of this revenue among the State's seven tourism regions, accounting for 15.4% of direct traveler spending or $1.064 billion dollars. (PSU/NHDTTD)

In 2014 & 2015 RPC commissioned the UNH Department of Natural Resources to conduct a visitor survey and tourism needs assessment as part of the update to the NH Coastal Byway Corridor Management Plan. Over 3,000 interviews were conducted. Among the top priorities related to the transportation system included improved information on parking availability (69%), improving shoulders on Route 1A and Route 1B to accommodate sharing of the road by people driving, bicycling and walking (60%), and improved signage to recreation and historic attractions (52%).

Given the importance of coastal tourism to the region's economy, it will also be critical to begin implementation of recommendations from the 2016 Coastal Risks and Hazards Commission report to incrementally improve the resiliency of NH1A and NH1B and other coastal infrastructure to increasing severe storm activity and best available projections for future sea level rise.

PUBLIC HEALTH NEEDS

Goal 9 – Public Health

The region's transportation system is designed and built to support safe and healthy communities, facilitate active living opportunities, and aging in place.

The transportation system has implications for public health in multiple ways. These include general transportation safety, impacts of vehicle emissions on air quality, and the extent to which people can access transportation to medical care. Multiple agencies have found lack of transportation to be a significant barrier to accessing routine health care for seniors and others in New Hampshire unable to drive themselves. These factors have all been discussed in the previous pages. A fourth facet of public health impacted by the transportation system is physical activity, and the extent to which our communities are built to support active transportation – i.e. walking or bicycling for short trips.

An often-cited statistic is that in 1969 48 percent of school age children typically walked or bicycled to school. In 2011 only 13 percent of that same age group walked or bicycled to school. (National Center for Safe Routes to School). Factors in this change include longer travel distances as communities become more spread out, parent concern about traffic danger as traffic has grown heavier, faster and more distracted; parent concern about crime, and more hectic family schedules.

A public health implication of more kids being driven rather than walking or bicycle is a decline in physical activity, which has in turn contributes to significant increases in childhood obesity seen

over the past three decades. According to the Center for Disease Control, in 2009 35.7% of New Hampshire adults were obese, compared to fewer than 14% in 1960. In 2009 33% of New Hampshire third graders were above a healthy weight, with 21% of boys and 15% of girls obese. The National Institute of Health has estimated the impact of weight related diseases at $147 billion annually on the U.S. healthcare system – or about 10% of all medical spending. Lost productivity for employers was estimated at an additional $3.4-$6.4 billion annually.

Needs to address the MPOs Public Health goal overlap largely with needs identified for other goals, including adoption of complete streets policies, development of local Safe Routes to School initiatives even in the absence of a state or federal commitment to funding these, and expanded community transportation to ensure access to medical are for vulnerable populations.

Planning Process Needs

Goal 10 – Efficient & Effective Planning Process

The MPO provides an efficient and effective implementation of the cooperative, coordinated, and continuous (3C) federal transportation planning process that aids in the efficient and effective implementation of projects.

As the designated MPO for its 27-community region, RPC is responsible for carrying out the federal 3Cs metropolitan transportation planning process. The planning process involves a coordinated, cooperative and comprehensive effort among local, regional, state, and federal agencies.

The MPO process consists of a number of interrelated elements and actions centered on the development and update of the Long Range Transportation Plan (LRTP) and the short range Transportation Improvement Program (TIP) for the region in a performance based planning framework. Integral to the development of the TIP and Plan is effective public involvement process. Addressing the anticipated needs to maintain an effective and efficient process means both continuing to refine current efforts as well as undertake new approaches and methods.

Work in recent years has focused on applying consistent methodologies and coordinated efforts with neighboring New Hampshire MPOs and NHDOT to produce consistent results. In that regard, the MPO has worked with those regional, state, and federal partners to develop project selection criteria and methodologies that are consistent statewide, coordinated data collection efforts and methods, and worked to understand the requirements for full implementation of the performance based planning process required by MAP-21 and the FAST Act.

A critical role of the MPO is to establish project priorities for implementation given limited funding for investment in the maintenance, preservation, modernization, and improvement of transportation infrastructure. Project selection criteria and processes have been used by the MPO for many years to quantify and justify priorities but until recent iterations, criteria were not consistently applied at the state level. For the 2013-2024 Ten Year Plan development cycle, a comprehensive process and a common set of selection criteria were created based around project benefits and impacts as well as project readiness and support. Variations on these criteria have been used as part of the process ever since.

There is a strong interest in extending this project prioritization process to many types of projects at the regional and state level across all modes of travel. To facilitate that, this process and the selection criteria need to be further defined and refined to better reflect the need for a strong transportation system across all modes and scales, and that reflects local, regional, and state priorities in the implementation of projects.

The involvement of the communities of the region is a critical component to the success of the MPO in putting forward the project priorities of the region. Participation in the Transportation Advisory Committee and the MPO Policy Committee remain at less than 100% and further efforts will be needed to engage those that do not participate in the regional process. There is also a need to expand the public involvement process to include educating community leadership and legislators about the MPO planning process and the role that the MPO and communities play in understanding and prioritizing the transportation needs that are addressed in the region. Work in that regard will provide benefits in terms of greater participation in the process as well.

With the assistance of a grant from the second Strategic Highway Research Program (SHRP2), the implementation of performance based planning as required under MAP-21 and the FAST Act is currently underway in partnership with the other NH MPOs, NHDOT, FHWA, FTA, and NHDES. The effort has produced data and methodologies for the required performance measures as well as a set of supplemental measures that are important to the regions. Just as importantly, it has established a partnership between the agencies that can be applied to addressing almost any mutual issue.

While the process will require ongoing coordination of efforts, there will be benefits for the content of the Plan and TIP, as well as supporting efforts.

Resource Needs

Goal 11 – Resource Availability

Adequate and predictable funding is available to meet current and future needs for transportation system maintenance, operation and modernization across all modes

The physical state of transportation infrastructure in the region has been a significant issue for many years and maintaining the system in the current era of inadequate funding remains a challenge.

Bridges are added to the NHDOT's Red List at a faster rate than repairs can be made to remove others from the list, as described in the previous chapter. While NHDOT has traditionally targeted paving/rehabilitation of 500 miles of roadway on an annual basis, in recent years fiscal constraint has allowed less than 300 miles to be completed per year. The gas tax and other methods of funding the transportation system have remained static since the early 1990s and when combined with fuel efficiency gains, have not kept pace with inflationary pressures that have raised construction and materials costs significantly over the same timeframe. This has resulted in significant underfunding of investment in the transportation infrastructure.

In 2014 the NH Legislature passed a bill that increased the road toll by $0.042/gallon for a period of 20 years. The increased revenue is dedicated largely to finishing I93 widening from Salem to Manchester, bridge rehabilitation and repair, and a small increase in the Highway Block Grant funding given to municipalities. While this is a step in the right direction, it falls short of providing the funds to address current, let alone future system needs.

Figure 4-9: Per Capita State Spending on Public Transportation

	Transit	Public Transit Operations
Massachusetts	$ 229.92	$ 204.46
Connecticut	$ 129.31	$ 89.55
Rhode Island	$ 52.90	$ 44.05
Vermont	$ 11.87	$ 9.65
Maine	$ 0.87	$ 0.41
New Hampshire	$ 0.51	$ 0.24
National Average	$ 47.20	
National Median	$ 4.20	

Source: AASHTO & APTA 2016

Funding for public transportation is a particular problem in New Hampshire. Most states provide a significant portion of the funding needed to match Federal Transit Administration (FTA) resources supporting regional public transportation. New Hampshire ranks consistently near the bottom nationally in the amount of State funding contributed to public transportation (***Figure 4-9***). In 2014 the national average per capita state spending on public transportation was $47.20. Removing the influence of states with major urban rail systems, the median per capita state investment was $4.20.

In comparison, New Hampshire contributed $0.51 per capita to public transportation, and most of this was in support of Intercity Bus service in the I93 corridor, or other transit services funded temporarily as mitigation for highway construction projects. Perhaps most important from a public transit operations standpoint, New Hampshire provides no regular state operating assistance to public transit agencies. The $0.24/capita shown in the table is again for services operated by COAST and UNH Wildcat Transit as mitigation for the Newington-Dover Spaulding Turnpike project. Most matching funding for COAST and CART is provided by municipalities together with on-bus advertising and interagency partnerships. This reliance on municipal match creates challenges in supporting multi-town regional transit services, where the loss of funding from one town can make a regional route unsustainable.

New Hampshire has even more significant problems in funding rail service, as the New Hampshire Constitution prohibits use of revenues from gas tax, vehicle registration, or road tolls for rail service. Expansion of passenger rail in the state will require identification of a dedicated state funding source.

5. The Constrained Transportation Plan

This chapter contains the fiscally constrained project list for the Long Range Transportation Plan.

PROJECTS AND FINANCES

For purposes of implementing the provisions of the Moving Ahead for Progress in the 21st Century Act (MAP-21), and its successor, Fixing America's Surface Transportation (FAST) Act, the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA) jointly issued revised planning regulations governing the development of the Long Range Transportation Plans (the Plan) and Transportation Improvement Programs for urbanized areas. These regulations are designed to ensure that metropolitan transportation planning and programming are adequate and that the areas are eligible for Federal highway and transit funds. One part of the planning regulations requires that the Plan include a financial plan "*that demonstrates how the adopted transportation plan can be implemented*" and provides supporting regulations in 23 CFR Part 450.324(g)(11):

(i) For purposes of transportation system operations and maintenance, the financial plan shall contain system-level estimates of costs and revenue sources that are reasonably expected to be available to adequately operate and maintain Federal-aid highways (as defined by 23 U.S.C. 101(a)(5)) and public transportation (as defined by title 49 U.S.C. Chapter 53).

(ii) For the purpose of developing the metropolitan transportation plan, the MPO, public transportation operator(s), and State shall cooperatively develop estimates of funds that will be available to support metropolitan transportation plan implementation, as required under §450.314(a). All necessary financial resources from public and private sources that are reasonably expected to be made available to carry out the transportation plan shall be identified.

(iii) The financial plan shall include recommendations on any additional financing strategies to fund projects and programs included in the metropolitan transportation plan. In the case of new funding sources, strategies for ensuring their availability shall be identified.

(iv) In developing the financial plan, the MPO shall take into account all projects and strategies proposed for funding under title 23 U.S.C., title 49 U.S.C. Chapter 53 or with other Federal funds; State assistance; local sources; and private participation. Revenue and cost estimates that support the metropolitan transportation plan must use an inflation rate(s) to reflect "year of expenditure dollars," based on reasonable financial principles and information, developed cooperatively by the MPO, State(s), and public transportation operator(s).

(v) For the outer years of the metropolitan transportation plan (*i.e.,* beyond the first 10 years), the financial plan may reflect aggregate cost ranges/cost bands, as long as the future funding source(s) is reasonably expected to be available to support the projected cost ranges/cost bands.

(vi) For nonattainment and maintenance areas, the financial plan shall address the specific financial strategies required

to ensure the implementation of TCMs (Transportation Control Measures) in the applicable SIP.

(vii) For illustrative purposes, the financial plan may include additional projects that would be included in the adopted transportation plan if additional resources beyond those identified in the financial plan were to become available.

(viii) In cases that the FHWA and the FTA find a metropolitan transportation plan to be fiscally constrained and a revenue source is subsequently removed or substantially reduced (*i.e.*, by legislative or administrative actions), the FHWA and the FTA will not withdraw the original determination of fiscal constraint; however, in such cases, the FHWA and the FTA will not act on an updated or amended metropolitan transportation plan that does not reflect the changed revenue situation.

ANTICIPATED REVENUES

Revenues expected to be available for transportation improvement projects were estimated utilizing data from the 2017-2020 Transportation Improvement Program (TIP) and State Transportation Improvement Program (STIP), adopted in December 2016, as well as the financial plan from the 2017-2026 State Ten Year Plan approved by the Legislature and signed by the Governor in the summer of 2016. Those documents provided the total funding estimates for FHWA and FTA apportioned funds, State funding sources, and Local (and other) resources for projects in the region. Also included are Toll Credits being utilized on transportation projects, GARVEE bonds and TIFIA funds for I-93 and the major infrastructure projects, Turnpike funds, as well as revenues from the recent four cent increase in the state road toll. Beyond 2026, revenues are projected based on the expected trend in Federal (small annual increase) and State (flat future year) revenues. This fiscal constraint documentation details the Federal, State, and Local/other resources expected to be available for the duration of the Plan and is included in this document as ***Figure 5-1***.

Figure 5.2 shows projections of Federal Transit Administration Section 5307 Urban Formula funding anticipated to be available to COAST and CART, the two public transit agencies in the region. Allowable uses for Section 5307 differ based on the size of the Census-defined Urbanized Area (UZA) in which a transit system operates. In Urbanized Areas with population between 50,000 and 200,000 (Small UZAs), Section 5307 funding may be used for operating expense (at a 50% federal/50% non-federal match split) as well as capital expenses (at an 80% federal/20% non-federal match split). In Urbanized Areas over 200,000 in population (Large UZAs), Section 5307 funding may only be used for capital expenses (at an 80% federal/20% non-federal match split). Non-federal funding is typically drawn from municipalities in New Hampshire, but may also include state, private sector, and other sources. Both systems receive funds based on the New Hampshire portion of the Boston Urbanized Area, which may be used only for capital expenses. COAST also receives funding based on apportionments to the Dover-Rochester and Portsmouth Urbanized Areas, which may be used for either capital or operating expenses. CART also receives Section 5307 funding based on the apportionment to the Derry-Londonderry-Windham segment of the Nashua Urbanized Area, which may be used for either capital or operating expenses. Beyond apportionments for FY2017-FY2020 identified in the FAST Act, future allocations are forecast to increase 1.5% annually. The Plan anticipates that the two transit systems will provide service levels that can be supported by this level of funding, including continuation of existing service and proposed service expansions. Although the plan is constrained on an annual basis by available federal

Figure 5.1: Estimates of Funding Availability (Statewide)

	Federal Highway Funds						Transit & Rail				
Year	FHWA	TIFIA	GARVEE	Fed Funds Available	Fed Aid Funds for I-93 Repayment	Net Federal Funds Available	FTA Funds	State Funds	Local/Other Match	Total Transit	Rail[5]
2017	$ 173,003,268	$ 53,740,000	$ -	$ 226,743,268	$ 19,120,000	$ 207,623,268	$ 22,184,966	$ 1,069,469	$ 7,282,459	$ 30,536,894	$ 600,000
2018	$ 178,136,881	$ 52,850,000	$ -	$ 230,986,881	$ 19,350,000	$ 211,636,881	$ 22,132,338	$ 39,331	$ 7,309,075	$ 29,480,745	$ 600,000
2019	$ 178,595,458	$ 54,570,000	$ 13,850,000	$ 247,015,458	$ 19,680,000	$ 227,335,458	$ 18,388,557	$ -	$ 6,605,354	$ 24,993,911	$ 2,100,000
2020	$ 182,867,443	$ 19,050,000	$ 24,980,000	$ 226,897,443	$ 19,930,000	$ 206,967,443	$ 19,004,333	$ -	$ 6,844,069	$ 25,848,402	$ 600,000
2021	$ 184,340,000	$ -	$ 22,140,000	$ 206,480,000	$ 18,860,000	$ 187,620,000	$ 19,841,060	$ -	$ 7,292,867	$ 27,133,927	$ 600,000
2022	$ 183,580,000	$ -	$ -	$ 183,580,000	$ 18,640,000	$ 164,940,000	$ 20,739,753	$ -	$ 7,791,959	$ 28,531,713	$ 2,100,000
2023	$ 183,820,000	$ -	$ -	$ 183,820,000	$ 18,340,000	$ 165,480,000	$ 21,711,187	$ -	$ 8,347,112	$ 30,058,298	$ 600,000
2024	$ 183,840,000	$ -	$ -	$ 183,840,000	$ 18,040,000	$ 165,800,000	$ 22,669,674	$ -	$ 8,955,453	$ 31,625,127	$ 600,000
2025	$ 190,370,000	$ -	$ -	$ 190,370,000	$ 17,750,000	$ 172,620,000	$ 23,842,012	$ -	$ 9,649,816	$ 33,491,828	$ 2,100,000
2026	$ 187,420,000	$ -	$ -	$ 187,420,000	$ 500,000	$ 186,920,000	$ 24,980,978	$ -	$ 10,407,004	$ 35,387,981	$ 600,000
2027	$ 190,720,732	$ -	$ -	$ 190,720,732	$ 500,000	$ 190,220,732	$ 23,801,374	$ -	$ 10,090,677	$ 33,892,051	$ 600,000
2028	$ 192,197,718	$ -	$ -	$ 192,197,718	$ 500,000	$ 191,697,718	$ 24,210,809	$ -	$ 10,461,979	$ 34,672,787	$ 2,100,000
2029	$ 193,674,705	$ -	$ -	$ 193,674,705	$ 500,000	$ 193,174,705	$ 24,620,243	$ -	$ 10,833,281	$ 35,453,523	$ 600,000
2030	$ 195,151,692	$ -	$ -	$ 195,151,692	$ 500,000	$ 194,651,692	$ 25,029,677	$ -	$ 11,204,582	$ 36,234,260	$ 600,000
2031	$ 196,628,679	$ -	$ -	$ 196,628,679	$ 500,000	$ 196,128,679	$ 25,439,111	$ -	$ 11,575,884	$ 37,014,996	$ 2,100,000
2032	$ 198,105,665	$ -	$ -	$ 198,105,665	$ 500,000	$ 197,605,665	$ 25,848,546	$ -	$ 11,947,186	$ 37,795,732	$ 600,000
2033	$ 199,582,652	$ -	$ -	$ 199,582,652	$ 500,000	$ 199,082,652	$ 26,257,980	$ -	$ 12,318,488	$ 38,576,468	$ 600,000
2034	$ 201,059,639	$ -	$ -	$ 201,059,639	$ 500,000	$ 200,559,639	$ 26,667,414	$ -	$ 12,689,790	$ 39,357,204	$ 2,100,000
2035	$ 202,536,625	$ -	$ -	$ 202,536,625	$ -	$ 202,536,625	$ 27,076,849	$ -	$ 13,061,092	$ 40,137,940	$ 600,000
2036	$ 204,013,612	$ -	$ -	$ 204,013,612	$ -	$ 204,013,612	$ 27,486,283	$ -	$ 13,432,393	$ 40,918,676	$ 600,000
2037	$ 205,490,599	$ -	$ -	$ 205,490,599	$ -	$ 205,490,599	$ 27,895,717	$ -	$ 13,803,695	$ 41,699,412	$ 2,100,000
2038	$ 206,967,585	$ -	$ -	$ 206,967,585	$ -	$ 206,967,585	$ 28,305,151	$ -	$ 14,174,997	$ 42,480,148	$ 600,000
2039	$ 208,444,572	$ -	$ -	$ 208,444,572	$ -	$ 208,444,572	$ 28,714,586	$ -	$ 14,546,299	$ 43,260,885	$ 600,000
2040	$ 209,921,559	$ -	$ -	$ 209,921,559	$ -	$ 209,921,559	$ 29,124,020	$ -	$ 14,917,601	$ 44,041,621	$ 2,100,000

Figure 5.1: Estimates of Funding Availability (Statewide)

	State Highway Funds						Turnpikes			
Year	Betterment[2]	State Aid Highway[2]	SB367 Revenues	Gross State Funds	SB367 Funds for I-93 Bonding	Net State Funds Available	Turnpike Improvements[7]	Turnpike Renewal & Replacement	Total Turnpike
2017	$ 22,030,000	$ 3,890,000	$ 24,110,000	$ 50,030,000	$ 480,000	$ 49,550,000	$ 29,760,000	$ 9,850,000	$ 39,610,000
2018	$ 22,030,000	$ 2,500,000	$ 30,710,000	$ 55,240,000	$ 1,150,000	$ 54,090,000	$ 28,470,000	$ 11,750,000	$ 40,220,000
2019	$ 22,030,000	$ 2,900,000	$ 31,460,000	$ 56,390,000	$ 1,820,000	$ 54,570,000	$ 21,700,000	$ 11,900,000	$ 33,600,000
2020	$ 22,030,000	$ 2,860,000	$ 36,080,000	$ 60,970,000	$ 2,370,000	$ 58,600,000	$ 31,510,000	$ 10,400,000	$ 41,910,000
2021	$ 22,030,000	$ 2,500,000	$ 32,360,000	$ 56,890,000	$ 2,540,000	$ 54,350,000	$ 36,570,000	$ 10,600,000	$ 47,170,000
2022	$ 22,030,000	$ 2,500,000	$ 32,860,000	$ 57,390,000	$ 2,560,000	$ 54,830,000	$ 38,440,000	$ 10,800,000	$ 49,240,000
2023	$ 22,030,000	$ 2,500,000	$ 32,260,000	$ 56,790,000	$ 2,560,000	$ 54,230,000	$ 26,000,000	$ 11,000,000	$ 37,000,000
2024	$ 22,030,000	$ 2,500,000	$ 34,650,000	$ 59,180,000	$ 2,560,000	$ 56,620,000	$ 44,500,000	$ 11,300,000	$ 55,800,000
2025	$ 22,030,000	$ 2,500,000	$ 29,505,500	$ 54,035,500	$ 2,550,000	$ 51,485,500	$ 35,900,000	$ 11,500,000	$ 47,400,000
2026	$ 22,030,000	$ 2,500,000	$ 33,530,000	$ 58,060,000	$ 23,600,000	$ 34,460,000	$ 57,500,000	$ 11,700,000	$ 69,200,000
2027	$ 22,030,000	$ 2,500,000	$ 33,530,000	$ 58,060,000	$ 23,600,000	$ 34,460,000	$ 35,035,000	$ 11,900,000	$ 46,935,000
2028	$ 22,030,000	$ 2,500,000	$ 33,530,000	$ 58,060,000	$ 23,600,000	$ 34,460,000	$ 35,035,000	$ 12,100,000	$ 47,135,000
2029	$ 22,030,000	$ 2,500,000	$ 33,530,000	$ 58,060,000	$ 23,600,000	$ 34,460,000	$ 35,035,000	$ 12,300,000	$ 47,335,000
2030	$ 22,030,000	$ 2,500,000	$ 33,530,000	$ 58,060,000	$ 23,600,000	$ 34,460,000	$ 35,035,000	$ 12,500,000	$ 47,535,000
2031	$ 22,030,000	$ 2,500,000	$ 33,530,000	$ 58,060,000	$ 23,600,000	$ 34,460,000	$ 35,035,000	$ 12,700,000	$ 47,735,000
2032	$ 22,030,000	$ 2,500,000	$ 33,530,000	$ 58,060,000	$ 23,600,000	$ 34,460,000	$ 35,035,000	$ 12,900,000	$ 47,935,000
2033	$ 22,030,000	$ 2,500,000	$ 33,530,000	$ 58,060,000	$ 23,600,000	$ 34,460,000	$ 35,035,000	$ 13,100,000	$ 48,135,000
2034	$ 22,030,000	$ 2,500,000	$ 33,530,000	$ 58,060,000	$ 23,600,000	$ 34,460,000	$ 35,035,000	$ 13,300,000	$ 48,335,000
2035	$ 22,030,000	$ 2,500,000	$ 33,530,000	$ 58,060,000	$ -	$ 58,060,000	$ 35,035,000	$ 13,500,000	$ 48,535,000
2036	$ 22,030,000	$ 2,500,000	$ 33,530,000	$ 58,060,000	$ -	$ 58,060,000	$ 35,035,000	$ 13,700,000	$ 48,735,000
2037	$ 22,030,000	$ 2,500,000	$ 33,530,000	$ 58,060,000	$ -	$ 58,060,000	$ 35,035,000	$ 13,900,000	$ 48,935,000
2038	$ 22,030,000	$ 2,500,000	$ 33,530,000	$ 58,060,000	$ -	$ 58,060,000	$ 35,035,000	$ 14,100,000	$ 49,135,000
2039	$ 22,030,000	$ 2,500,000	$ 33,530,000	$ 58,060,000	$ -	$ 58,060,000	$ 35,035,000	$ 14,300,000	$ 49,335,000
2040	$ 22,030,000	$ 2,500,000	$ 33,530,000	$ 58,060,000	$ -	$ 58,060,000	$ 35,035,000	$ 14,500,000	$ 49,535,000

funding, implementation of new services is also dependent on local support from communities served by the systems.

Figure 5.2: Expected Transit funding – Allocations to COAST & CART plus matching funds

	FTA Allocation	State Funds	Local Match	Total
2017	$4,945,798	$916,750	$3,123,392	$8,985,940
2018	$3,952,251	$35,125	$2,796,155	$6,783,531
2019	$3,997,197	$7,125	$3,070,858	$7,075,180
2020	$3,954,697	$3,375	$3,119,501	$7,077,573
2021	$4,086,854	$3,750	$3,151,853	$7,242,457
2022	$4,129,354	$7,500	$3,155,603	$7,292,457
2023	$4,129,354	$7,500	$3,155,603	$7,292,457
2024	$4,129,354	$7,500	$3,155,603	$7,292,457
2025	$4,129,354	$7,500	$3,155,603	$7,292,457
2026	$4,052,354	$7,500	$3,136,353	$7,196,207
2027	$4,113,140	$7,500	$3,183,398	$7,304,038
2028	$4,174,837	$7,500	$3,231,149	$7,413,486
2029	$4,237,459	$7,500	$3,279,616	$7,524,575
2030	$4,301,021	$7,500	$3,328,810	$7,637,332
2031	$4,365,537	$7,500	$3,378,742	$7,751,779
2032	$4,431,020	$7,500	$3,429,424	$7,867,943
2033	$4,497,485	$7,500	$3,480,865	$7,985,850
2034	$4,564,947	$7,500	$3,533,078	$8,105,525
2035	$4,633,421	$7,500	$3,586,074	$8,226,996
2036	$4,702,923	$7,500	$3,639,865	$8,350,288
2037	$4,773,467	$7,500	$3,694,463	$8,475,430
2038	$4,845,069	$7,500	$3,749,880	$8,602,449
2039	$4,917,745	$7,500	$3,806,128	$8,731,373
2040	$4,991,511	$7,500	$3,863,220	$8,862,231

Information was provided by NH DOT regarding the expected funding available statewide for maintenance and operations of the State Highway System, and this is shown in ***Figure 5.3*** along with estimates of local funds available for the same purposes. Estimates were provided by NH DOT for maintenance and operations for Fiscal Years 2007-2010, and utilizing the average annual growth rate of funding during those years, estimates where extrapolated for each year to 2040. These values were divided by the current miles of state roadways to obtain a per mile cost for maintenance and operations. This value was then multiplied by the miles of state roadway in the RPC region to obtain an estimate of funding available for maintenance and operations activities on State highways within the region. Figure 5.3 also includes an estimate of municipal funding available for local transportation infrastructure maintenance, operations, and improvements that is derived from the highway budget, warrant articles, and Capital Improvement Program (CIP) listings in the 2016 annual community reports as well as the State Block Grant funds distributed to each. The funds available for each community are shown in ***Figure 5.4*** as well as an average per mile expenditure derived from the total funding available in the region divided by the total miles of locally maintained roadways. The $21,749 per mile shown is the average based on the highway budget, any identified winter maintenance and lighting, as well as CIP funding for each community. This number was then applied as the starting point for the estimate of local road maintenance and operations needs in Figure 5.3. To calculate future needs for operations and maintenance, the average value for the municipalities was inflated at the same rate as the state per mile cost and then combined with State funds to obtain an estimate of total maintenance and operations needs for the region.

Figure 5.3: Estimated Maintenance & Operations Needs for the Region

Year	State Op &Maint	State Cost/Mile	RPC Share for State Roads	Estimated cost/ mi for local M&O	Estimated Local Road M&O Needs	Total M&O Needs
2017	$132,395,319	$14,289	$13,179,375	$12,084	$24,269,569	$37,448,944
2018	$135,771,400	$14,654	$13,515,449	$12,393	$24,888,443	$38,403,892
2019	$139,233,571	$15,027	$13,860,093	$12,709	$25,523,098	$39,383,191
2020	$142,784,027	$15,411	$14,213,526	$13,033	$26,173,937	$40,387,463
2021	$146,425,019	$15,804	$14,575,971	$13,365	$26,841,372	$41,417,343
2022	$150,158,857	$16,207	$14,947,658	$13,706	$27,525,827	$42,473,485
2023	$153,987,908	$16,620	$15,328,823	$14,055	$28,227,736	$43,556,559
2024	$157,914,600	$17,044	$15,719,708	$14,414	$28,947,543	$44,667,252
2025	$161,941,422	$17,478	$16,120,561	$14,781	$29,685,706	$45,806,266
2026	$166,070,929	$17,924	$16,531,635	$15,158	$30,442,691	$46,974,326
2027	$170,305,737	$18,381	$16,953,192	$15,545	$31,218,980	$48,172,172
2028	$174,648,534	$18,850	$17,385,498	$15,941	$32,015,064	$49,400,562
2029	$179,102,071	$19,330	$17,828,828	$16,348	$32,831,448	$50,660,276
2030	$183,669,174	$19,823	$18,283,463	$16,764	$33,668,650	$51,952,113
2031	$188,352,738	$20,329	$18,749,692	$17,192	$34,527,200	$53,276,892
2032	$193,155,733	$20,847	$19,227,809	$17,630	$35,407,644	$54,635,453
2033	$198,081,204	$21,379	$19,718,118	$18,080	$36,310,539	$56,028,657
2034	$203,132,275	$21,924	$20,220,930	$18,541	$37,236,458	$57,457,388
2035	$208,312,148	$22,483	$20,736,564	$19,014	$38,185,987	$58,922,551
2036	$213,624,107	$23,056	$21,265,346	$19,499	$39,159,730	$60,425,076
2037	$219,071,522	$23,644	$21,807,612	$19,996	$40,158,303	$61,965,916
2038	$224,657,846	$24,247	$22,363,707	$20,506	$41,182,340	$63,546,047
2039	$230,386,621	$24,865	$22,933,981	$21,029	$42,232,490	$65,166,471
2040	$236,261,480	$25,499	$23,518,798	$21,565	$43,309,418	$66,828,216

State Roadway Miles =	9265.3	
MPO Share of State Roads =	922.3	9.95%
Inflation Rate =	2.55%	

Figure 5.4: Municipal Operations and Maintenance Expenditures

Town	Miles of Town Roads	Highway Budget	Warrant/CIP	Total	Per Mile Cost (Budgeted)	Per Mile Cost (Budgeted + Warrant/ CIP)	MV Registrations (State & Town Fees)	Block Grant Aid	Block Grant Aid /Mile
Atkinson	70.051	$513,474	$350,314	$1,377,262	$7,330	$19,661	$1,630,892	$155,669	$2,222
Brentwood	66.226	$358,783	$470,001	$1,187,567	$5,418	$17,932	$1,020,753	$116,347	$1,757
Danville	56.035	$555,021	$72,216	$1,182,258	$9,905	$21,099	$813,053	$107,742	$1,923
East Kingston	31.277	$428,533	$0	$857,066	$13,701	$27,402	$536,213	$51,466	$1,645
Epping	117.402	$948,233	$35,000	$1,931,466	$8,077	$16,452	$1,396,221	$182,254	$1,552
Exeter	116.204	$2,737,803	$592,037	$6,067,643	$23,560	$52,215	$2,494,739	$286,074	$2,462
Fremont	60.819	$419,841	$155,495	$995,178	$6,903	$16,363	$908,031	$111,869	$1,839
Greenland	47.456	$828,415	$0	$1,656,830	$17,456	$34,913	$1,032,958	$82,404	$1,736
Hampstead	86.982	$854,805	$0	$1,709,610	$9,827	$19,655	$1,859,506	$195,522	$2,248
Hampton	121.522	$2,331,676	$1,341,875	$6,005,227	$19,187	$49,417	$3,412,076	$304,634	$2,507
Hampton Falls	42.135	$171,221	$250,000	$592,442	$4,064	$14,061	$631,559	$65,955	$1,565
Kensington	33.314	$163,178	$200,000	$526,356	$4,898	$15,800	$511,729	$55,993	$1,681
Kingston	89.396	$765,774	$483,231	$2,014,779	$8,566	$22,538	$1,285,920	$167,205	$1,870
New Castle	11.139	$96,625	$0	$193,250	$8,674	$17,349	$297,207	$19,525	$1,753
Newfields	21.186	$276,906	$0	$553,812	$13,070	$26,140	$396,926	$41,743	$1,970
Newington	49.730	$302,946	$150,000	$755,892	$6,092	$15,200	$349,110	$133,333	$2,681
Newton	47.596	$359,379	$0	$718,758	$7,551	$15,101	$999,584	$104,109	$2,187
North Hampton	64.239	$647,999	$542,000	$1,837,998	$10,087	$28,612	$1,325,745	$100,391	$1,563
Plaistow	58.028	$578,361	$128,000	$1,284,722	$9,967	$22,140	$1,648,878	$149,404	$2,575
Portsmouth	165.052	$1,828,782	$7,713,000	$11,370,564	$11,080	$68,891	$4,298,351	$422,251	$2,558
Raymond	126.323	$951,797	$254,000	$2,157,594	$7,535	$17,080	$1,973,851	$238,370	$1,887
Rye	64.153	$1,231,028	$355,000	$2,817,056	$19,189	$43,912	$1,459,945	$132,424	$2,064
Salem	220.164	$3,753,760	$4,757,604	$12,265,124	$17,050	$55,709	$6,252,591	$630,762	$2,865
Sandown	79.958	$744,963	$535,000	$2,024,926	$9,317	$25,325	$1,247,285	$159,332	$1,993
Seabrook	63.999	$1,556,372	$722,203	$3,834,947	$24,319	$59,922		$170,144	$2,659
South Hampton	17.088	$64,292	$27,500	$156,084	$3,762	$9,134	$217,809	$22,508	$1,317
Stratham	80.866	$799,601	$275,000	$1,874,202	$9,888	$23,177	$1,918,789	$168,457	$2,083
Total	2008.340	$24,269,569	$19,409,476	$67,948,614	$12,084	$33,833	$39,919,722	$4,375,889	

Data derived from 2016 Municipal Reports & 2016 State Block Grant Aid Report

ANTICIPATED COSTS

The transportation projects included in the Long Range Plan encompass all of those in the 2017-2020 Transportation Improvement Program (TIP), The 2017-2026 State Ten Year Plan, and other project needs identified by communities, transit agencies, as well as the RPC. These projects are divided into two groups for inclusion in the LRTP to separate those in the TIP from the other proposals.

Project costs for the Transportation Improvement Program are taken directly from the year of expenditure inflated values included in the 2017-2020 Transportation Improvement Program (TIP) as of Amendment #2. As the State of New Hampshire does not sub-allocate funds to the MPOs for programming the TIPs, the assumption is that since the State Transportation Improvement Program (STIP) is fiscally constrained, and the MPO TIP is directly derived from that document, it must therefore be fiscally constrained as well. A similar method is used to determine anticipated regional revenues and costs for the remainder of the State Ten Year Plan period (2021-2026) and the project costs included, are taken directly from that document and are inflated to year of construction dollars.

While the financial picture for the remainder of the Plan is less clear than that of the TIP and the Ten Year Plan portion, the costs associated with the listed projects are within the estimates of funding available to the region based on the methodology described, and based on the assumption that the State Ten Year Plan is fiscally constrained and that all the projects listed for the MPO region will be constructed within that timeframe. Given the information available from NH DOT regarding the funds available within the Ten Year Plan, and estimates of funding available in the later years of the plan, it is expected that the current list of projects is financially constrained assuming that there is some growth in revenues during the period of the Long Range Plan.

Figure 5.5 integrates the information included in Figure 5.1 through 5.4 into a summary of projected total funding available each year for the region, as well as anticipated expenditures based on current project programming. Figure 5.5 develops an RPC share of funding based on an average of the region's percentage of New Hampshire's population (14.45%) and lane miles of roadway (12.4%) for an average value of 13.3%. Turnpike funding is calculated somewhat differently as the RPC region has a greater share of Turnpike lane miles (28.6%) and that share is used from 2027-2040. Additionally, it is assumed that the amount of funding available to the RPC is equal to the amount programmed in the TIP for the RPC region for years 2017-2020, and in the Ten Year Plan for years 2021-2026. This means that the percentage of funding allocated to the region will vary more through that time period. After 2026, the RPC share is constrained to the calculated 13.3% rate and 28.6% of turnpike funds. Once expenses are removed, the revenues must balance annually with costs so that the region is not spending more funding than is anticipated to be available in a given year.

Figure 5.5: Fiscal Constraint Summary for the 2017-2020 Transportation Improvement Program & 2040 Long Range Transportation Plan

Source of Data		Fiscal Year	Estimated Regional Share of Available Funding[1,2,3]						Estimated Total Project Costs[6]						
			Federal	State[4]	Other	Statewide Programs[5]	Maintenance & Operations	Total Target Funding	Regional Projects	Statewide Programs[7]	Maintenance & Operations	Transit	Turnpike Projects[8]	Total Project Costs	Remaining[9]
2040 Long Range Transportation Plan	2017-2020 TIP	2017	$ 33,962,033	$ 22,153,214	$ 21,598,528	$ 12,073,009	$ 37,448,944	$ 127,235,729	$ 51,885,397	$ 12,073,009	$ 37,448,944	$ 8,985,940	$ 16,842,439	$ 127,235,729	$ -
		2018	$ 56,609,935	$ 24,139,330	$ 30,984,121	$ 9,854,559	$ 38,403,892	$ 159,991,836	$ 82,553,495	$ 9,854,559	$ 38,403,892	$ 6,783,531	$ 22,396,359	$ 159,991,836	$ -
		2019	$ 38,672,334	$ 43,547,852	$ 7,944,253	$ 11,543,520	$ 39,383,191	$ 141,091,151	$ 49,772,729	$ 11,543,520	$ 39,383,191	$ 7,075,180	$ 33,316,530	$ 141,091,151	$ -
		2020	$ 40,862,564	$ 45,746,610	$ 7,615,286	$ 11,342,324	$ 40,387,463	$ 145,954,248	$ 51,592,599	$ 11,342,324	$ 40,387,463	$ 7,077,573	$ 35,554,288	$ 145,954,248	$ -
	2017-2026 State Ten Year Plan	2021	$ 17,820,813	$ 21,076,861	$ 7,633,671	$ 11,207,518	$ 41,417,343	$ 99,156,155	$ 18,219,477	$ 11,207,518	$ 41,417,343	$ 7,242,457	$ 21,069,361	$ 99,156,155	$ -
		2022	$ 22,853,850	$ 3,065,000	$ 7,591,198	$ 11,074,877	$ 42,473,485	$ 87,058,410	$ 23,317,591	$ 11,074,877	$ 42,473,485	$ 7,292,457	$ 2,900,000	$ 87,058,410	$ -
		2023	$ 15,026,289	$ 15,000	$ 7,515,423	$ 11,102,698	$ 43,556,559	$ 77,215,969	$ 15,264,254	$ 11,102,698	$ 43,556,559	$ 7,292,457	$ -	$ 77,215,969	$ -
		2024	$ 51,699,396	$ 15,000	$ 7,448,954	$ 11,131,410	$ 44,667,252	$ 114,962,012	$ 51,870,893	$ 11,131,410	$ 44,667,252	$ 7,292,457	$ -	$ 114,962,012	$ -
		2025	$ 30,497,985	$ 15,000	$ 7,346,698	$ 11,094,275	$ 45,806,266	$ 94,760,225	$ 30,567,226	$ 11,094,275	$ 45,806,266	$ 7,292,457	$ -	$ 94,760,225	$ -
		2026	$ 24,052,354	$ 15,000	$ 7,197,860	$ 11,124,854	$ 46,974,326	$ 89,364,395	$ 24,069,007	$ 11,124,854	$ 46,974,326	$ 7,196,207	$ -	$ 89,364,395	$ -
		2027	$ 29,412,497	$ 15,767,853	$ 7,197,127	$ 10,000,472	$ 48,172,172	$ 110,550,121	$ 12,441,183	$ 10,000,472	$ 48,172,172	$ 7,304,038	$ 11,177,173	$ 89,095,037	$ 21,455,083
		2028	$ 29,670,633	$ 15,939,983	$ 7,161,984	$ 10,000,473	$ 49,400,562	$ 112,173,635	$ 18,893,045	$ 10,000,473	$ 49,400,562	$ 7,413,486	$ 11,349,303	$ 97,056,868	$ 15,116,767
		2029	$ 29,929,695	$ 14,071,947	$ 7,127,558	$ 9,995,897	$ 50,660,276	$ 111,785,374	$ 22,443,651	$ 9,995,897	$ 50,660,276	$ 7,524,575	$ 9,481,267	$ 100,105,668	$ 11,679,706
		2030	$ 30,189,696	$ 16,416,868	$ 7,093,859	$ 9,995,898	$ 51,952,113	$ 115,648,434	$ 24,508,251	$ 9,995,898	$ 51,952,113	$ 7,637,332	$ 11,826,188	$ 105,919,782	$ 9,728,652
		2031	$ 30,450,651	$ 17,901,138	$ 7,060,897	$ 9,995,898	$ 53,276,892	$ 118,685,476	$ 14,596,517	$ 9,995,898	$ 53,276,892	$ 7,751,779	$ 13,310,458	$ 98,931,544	$ 19,753,932
		2032	$ 30,712,573	$ 18,485,252	$ 7,028,685	$ 9,995,898	$ 54,635,453	$ 120,857,861	$ 18,977,090	$ 9,995,898	$ 54,635,453	$ 7,867,943	$ 13,894,572	$ 105,370,955	$ 15,486,905
		2033	$ 30,975,478	$ 15,031,361	$ 6,997,233	$ 9,995,898	$ 56,028,657	$ 119,028,627	$ 26,194,879	$ 9,995,898	$ 56,028,657	$ 7,985,850	$ 10,440,681	$ 110,645,966	$ 8,382,661
		2034	$ 31,239,379	$ 20,336,356	$ 6,966,552	$ 9,995,898	$ 57,457,388	$ 125,995,574	$ 28,415,542	$ 9,995,898	$ 57,457,388	$ 8,105,525	$ 15,745,676	$ 119,720,030	$ 6,275,544
		2035	$ 31,570,793	$ 21,104,839	$ 6,936,655	$ 9,995,898	$ 58,922,551	$ 128,530,736	$ 26,369,381	$ 9,995,898	$ 58,922,551	$ 8,226,996	$ 13,375,359	$ 116,890,186	$ 11,640,551
		2036	$ 31,836,733	$ 27,256,376	$ 6,907,553	$ 9,995,898	$ 60,425,076	$ 136,421,636	$ 20,585,410	$ 9,995,898	$ 60,425,076	$ 8,350,288	$ 19,526,896	$ 118,883,568	$ 17,538,068
		2037	$ 32,103,716	$ 20,973,625	$ 6,879,257	$ 9,995,899	$ 61,965,916	$ 131,918,413	$ 25,461,803	$ 9,995,899	$ 61,965,916	$ 8,475,438	$ 13,244,145	$ 119,143,193	$ 12,775,220
		2038	$ 32,371,757	$ 21,030,061	$ 6,851,780	$ 10,195,931	$ 63,546,047	$ 133,995,577	$ 30,952,280	$ 10,195,931	$ 63,546,047	$ 8,602,449	$ 13,300,581	$ 126,597,288	$ 7,398,289
		2039	$ 32,640,873	$ 21,086,498	$ 6,825,135	$ 9,795,867	$ 65,166,471	$ 135,514,843	$ 34,530,319	$ 9,795,867	$ 65,166,471	$ 8,731,373	$ 13,357,018	$ 131,581,047	$ 3,933,796
		2040	$ 32,911,078	$ 21,142,934	$ 6,799,334	$ 9,995,899	$ 66,828,216	$ 137,677,460	$ 22,045,623	$ 9,995,899	$ 66,828,216	$ 8,862,231	$ 13,413,454	$ 121,145,422	$ 16,532,038
			$ 768,073,106	$ 426,333,958	$ 210,709,550	$ 251,500,768	$ 1,218,956,512	$ 2,875,573,894	$ 725,527,644	$ 251,500,768	$ 1,218,956,512	$ 186,370,010	$ 315,521,748	$ 2,697,876,682	$ 177,697,212

1 First four years of estimated available funding is derived from projects programmed in the 2017-2020 STIP as of Amendment 2

2 2021-2026 estimated available funding is derived from projects programmed in the 2017-2026 State Ten Year Plan

3 2027-2040 Federal, State, and Other funds are derived from extending funding trend from State Ten Year Plan "Total Program Dollars by FY" table dated 5/16/2016

4 Includes bond revenues, turnpike funds, and road toll funds. Turnpike Toll Credits are not included.

5 Statewide Program funds available derived from a share (13.3%) of the total Programmatic funding in STIP extended to 2040

6 Project costs are inflated at 2.55% per year from the year of the most recent cost estimate

7 13.3% share of Statewide Programmatic funds from STIP. Assumed to be equal to regional share of available funding.

8 Turnpike Expenditures are based on the Ten Year Plan from 2017-2026. Post 2026 value is a 28.599% share of Turnpike funds available

9 Estimated as difference between estimated regional target funding and total project cost for each fiscal year

FISCALLY CONSTRAINED PROJECTS LISTS

The projects for the 2040 Long Range Plan are divided into two tables. The first is the 2017-2020 Transportation Improvement Program (TIP), while the second contains all of the projects in the years after the TIP (2021-2040). Each of these tables is described in more detail below.

TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

The Transportation Improvement Program (TIP) encompasses the first four years of the Plan (2017-2020) and only those projects that are committed to be implemented can be listed. For that reason, the scope of the project is generally well defined, and include cost estimates are more detailed and accurate for the work that is anticipated. TIP projects are shown in detail in ***Figure 5.6 and Map 5.1.*** The TIP is organized alphabetically by project name, and the listing for each includes the location, scope of work, Clean Air Act (CAA) code, funding category, phases included, and funding listed by fiscal year and by source. The costs of the projects are year-of-expenditure estimates taken directly from the NH DOT database for the 2017-2020 STIP and the RPC 2017-2020 TIP. Project costs for years 2017 and 2018 are uninflated, while those for 2019 and 2020 are inflated at 2.55% per year

TRANSPORTATION PLAN PROJECTS

Those projects not in the 2017-2020 TIP are listed in the Transportation Plan project listing which covers the years from 2021 to 2040. As these projects are less well developed than those projects in the TIP, the information available regarding the scope and cost is less definite. The project list as detailed in ***Figure 5.7***, includes the RPC assigned project number, the community that the project is occurring in, project rank, years for which funds are programmed, and cost by project phase. In addition, the first year of construction is listed to indicate when the project is estimated to begin that phase of work. These projects are shown on ***Map 5.2***. While some costs have a basis in a corridor study or other engineers estimates, most are simply order of magnitude estimates of the construction (CON) costs of each project as well as considerations for preliminary engineering (PE), right-of-way (ROW), and Other costs.

UNFUNDED PROJECTS

There are a number of projects in the Plan project listing that have no cost estimates associated with them. These are projects for which no cost estimate is available, the scope is not determined, or the need for the project is unclear. These projects are included for Illustrative purposes only. In the case of the bridge projects, no estimate has been produced either by the community or the NH DOT Bridge Section. The remaining projects have either no estimate available or questions regarding their scope, purpose, or ultimate need. The projects are:

- 6153006 – Exeter: Pedestrian improvements linking Amtrak station and downtown.
- 6153007 – Exeter: Washington St Traffic Calming
- 6001003 – Exeter to Newton: NH 108 Shoulder widening
- 6167002 – Fremont: Scribner Rd Bridge Rehab/Replacement
- 6187001 – Greenland: Truck Stop Electrification
- 6187002 – Greenland: Capacity Improvements NH 33
- 6001004 – Hampstead to Plaistow: NH 121A Shoulder widening
- 6001005 – Hampstead to Sandown: NH 121A Shoulder widening
- 6197003 – Seabrook-Hampton: Replace NH 1A Bridge
- 6197007 – Hampton: Service Road parallel to US 1

- 6327001 – Newfields: New Road Bridge Replace/ Rehabilitation
- 6341003 – Newton: NH 108 Shoulders
- 6375002 – Plaistow: MBTA Extension
- 6001009 – Atkinson to Plaistow: NH 121 Safety Improvements
- 6379009 – Portsmouth: New travel corridor paralleling Islington Street
- 6399002 – Salem: Emerson Way Bridge Replacement
- 6399003 – Salem: Haverhill Road Bridge Replacement
- 6399005 – Salem: Lawrence Road bridge rehabilitation
- 6409020 – Seabrook: NH 107 Capacity Expansion

MPO Staff will continue to work with the DOT and communities to generate estimates for them as well as determine their scope and need.

Figure 5.6: Current Transportation Improvement Program (Summary)

Agency/Community				Fiscal Year					Funding Source		
Project #	Route	Scope Summary	Funding Programs	2017	2018	2019	2020	Grand Total	Federal	State	Other
CART											
60100A		Coop. Alliance for Reg. Transportation - Preventative Maintenance (Derry-Salem region)	FTA 5307 Capital and Operating Program, Other	$96,250	$99,330	$102,509	$105,789	$403,877	$323,102		$80,775
60100B		Coop. Alliance for Reg. Transportation - Operating Assistance	FTA 5307 Capital and Operating Program, Other	$221,900	$229,001	$236,329	$243,891	$931,121	$465,560		$465,560
60100C		Coop. Alliance for Reg. Transportation - Mobility Mgmt	FTA 5307 Capital and Operating Program, FTA 5310 Capital Program, Other	$275,875	$178,020	$183,717	$189,596	$827,207	$661,766		$165,441
60100D		Coop. Alliance for Reg. Transportation - General & Comprehensive Planning.	FTA 5307 Capital and Operating Program, Other	$13,750	$14,190	$14,644	$15,113	$57,697	$46,157		$11,539
60100E		Coop. Alliance for Reg. Transportation - Capital program	FTA 5307 Capital and Operating Program, FTA 5339 Bus and Bus Facilities, NH Highway Fund, Other	$190,000	$98,040	$101,177	$49,460	$438,677	$372,875	$32,901	$32,901
CART Total				$797,775	$618,581	$638,375	$603,848	$2,658,579	$1,869,461	$32,901	$756,218
COAST											
60000A		Cooperative Alliance for Seacoast Transportation - Operating Assistance. Annual project.	FTA 5307 Capital and Operating Program, Other	$2,477,140	$2,429,936	$2,842,064	$3,009,791	$10,758,931	$5,379,465		$5,379,465
60000B		Cooperative Alliance for Seacoast Transportation (COAST) - Preventative maintenance.	FTA 5307 Capital and Operating Program, Other	$534,298	$551,396	$569,040	$587,249	$2,241,983	$1,793,587		$448,397
60000C		Cooperative Alliance for Seacoast Transportation (COAST) - Miscellaneous support equipment.	FTA 5307 Capital and Operating Program, Other	$500,000	$123,019	$103,198	$108,500	$834,716	$667,773		$166,943
60000D		Cooperative Alliance for Seacoast Transportation (COAST) - Bus station equipment.	FTA 5307 Capital and Operating Program, Other	$100,000	$75,000	$62,500	$62,499	$299,999	$239,999		$60,000
60000E		Cooperative Alliance for Seacoast Transportation (COAST) - General & Comprehensive Planning.	FTA 5307 Capital and Operating Program, Other	$85,203	$87,929	$90,743	$93,647	$357,523	$286,018		$71,505
60000F		Cooperative Alliance for Seacoast Transportation (COAST) - ADA Operations. Annual project.	FTA 5307 Capital and Operating Program, Other	$372,384	$285,128	$294,252	$303,668	$1,255,433	$1,004,346		$251,087
60000G		Cooperative Alliance for Seacoast Transportation (COAST) - Capital program.	FTA 5307 Capital and Operating Program, Other	$540,000	$165,000			$705,000	$564,000		$141,000
60000H		Mobility Management for COAST	FTA 5307 Capital and Operating Program, Other	$43,750	$45,100	$46,500		$135,350	$108,280		$27,070
68069		Cooperative Alliance for Seacoast Transportation (COAST) - capital/oper for Newington-Dover.	FTA 5307 Capital and Operating Program, Turnpike Capital	$1,046,964	$149,103			$1,196,067	$234,867	$961,201	
COAST Total				$5,699,739	$3,911,611	$4,008,297	$4,165,355	$17,785,002	$10,278,336	$961,201	$6,545,466
COMMUTER/INTERCITY BUS REPLACEMENT											
40284	VARIOUS	Replacement of existing state-owned coaches used for commuter and intercity bus.	Congestion Mitigation and Air Quality Program, FTA 5307 Capital & Operating Program, Toll Credit	$3,096,000	$3,201,997	$4,491,486		$10,789,484	$10,789,484		
EAST KINGSTON											
26942	NH Route 107A	NH 107A over B&M Railroad & Road, Superstructure Replacement and Substructure Rehab, Br No 061/064	Bridge Off System, STP-Off System Bridge, Toll Credit	$1,435,915				$1,435,915	$1,435,915		
EPPING											
29608	NH 125	NH Rte 125 Improvements from NH 27 to NH 87 - 1.7 miles	National Highway System, Toll Credit	$397,320	$87,864	$1,209,015	$134,752	$1,828,952	$1,828,952		
HAMPTON											
29609	NH 1A	Engineering study / design for Ocean Blvd improvements	STP-State Flexible, Toll Credit		$302,254			$302,254	$302,254		

Figure 5.6: Current Transportation Improvement Program (Summary)

Agency/Community				Fiscal Year					Funding Source		
Project #	Route	Scope Summary	Funding Programs	2017	2018	2019	2020	Grand Total	Federal	State	Other
HAMPTON - PORTSMOUTH											
26485	Hampton Branch Rail Corridor	Purchase rail corridor from Hampton to Portsmouth approximately 9.7 miles and improve trail surface.	Congestion Mitigation and Air Quality Program, Toll Credit		$2,043,360			$2,043,360	$2,043,360		
HAMPTON FALLS											
29610	US 1	Intersection improvements to enhance traffic operations and safety	NH Highway Fund, STP-State Flexible		$302,254			$302,254	$241,803	$60,451	
NEW CASTLE											
29614	NH 1B	Feasibility study for causeway improvements for NH Rte 1B	STP-State Flexible, Toll Credit		$117,153			$117,153	$117,153		
NEW CASTLE - RYE											
16127	NH 1B	Bridge replace, Single Leaf Bascule Bridge, NH 1B over Little Harbor (Red List) Br No 066/071	STP-5 to 200K, Toll Credit	$1,100	$5,017,584	$2,269,264	$2,009,365	$9,297,313	$9,297,313		
NEWINGTON - DOVER											
11238	NH 16 / US 4 / SPLDG TPK	NH 16 WIDEN TURNPIKE INCLUDING LITTLE BAY BRIDGES FROM GOSLING ROAD TO DOVER TOLL.	Turnpike Capital	$82,560				$82,560		$82,560	
11238O	NH 16 / US 4 / SPLDG TPK	NH 16 / US 4 SPLDG TPK, Rehabilitate the existing Little Bay Bridges	Non Participating, Turnpike Capital	$6,028,211	$3,849,675			$9,877,886		$9,877,886	
11238Q	NH 16, US 4 & SPAULDING TURNPIKE	Reconstruct Spaulding Tpk from LBB to Dover Toll Booth & Exit 6 interchange (incl. new soundwalls)	Non Participating, Turnpike Capital	$12,131,494	$16,314,288	$16,314,288	$16,314,288	$61,074,359		$61,074,359	
11238S	SPAULDING TURNPIKE / LITTLE BAY BRIDGES	General Sullivan Bridge Rehabilitation	Turnpike Capital			$6,578,801	$13,461,589	$20,040,390		$20,040,390	
NEWINGTON - DOVER Total				$18,242,264	$20,163,963	$22,893,090	$29,775,877	$91,075,195	$0	$91,075,195	$0
NEWTON											
29617	NH 108	Improvements to Rowe's Corner (Maple Ave, Amesbury Rd)	NH Highway Fund, STP-State Flexible, Toll Credit	$146,441		$187,156		$333,596	$296,165	$37,431	
NORTH HAMPTON											
24457	US Route 1	Replace bridge carrying US 1 over Boston & Maine RR (Redlist Br No 148/132)	STP-State Flexible, Toll Credit	$220,000	$510,840	$234,305	$90,676	$1,055,821	$1,055,821		
PAVE-T2-REHAB											
PAVE-T2-REH	VARIOUS	Rehab of Tier 2 roads.	Betterment, STP-State Flexible, Toll Credit	$8,150,000			$2,500,000	$10,650,000	$7,583,988	$3,066,012	
PLAISTOW - KINGSTON											
10044E	NH 125	Reconstruct NH 125: anticipated 3 lanes, from south of town line northerly approx 1.8 mi	National Highway System, Toll Credit	$1,100,000	$4,245,648	$3,866,037	$120,902	$9,332,587	$9,332,587		

Figure 5.6: Current Transportation Improvement Program (Summary)

Agency/Community				Fiscal Year					Funding Source		
Project #	Route	Scope Summary	Funding Programs	2017	2018	2019	2020	Grand Total	Federal	State	Other
PORTSMOUTH											
13455D	US 1 BYPASS	US 1 Bypass: Replace Woodbury Avenue and Stark Street bridges over Bypass	STP-State Flexible, Toll Credit				$7,616,796	$7,616,796	$7,616,796		
13455E	US Rte. 1 Bypass	Albacore Access Road reconstruction and intersection improvements with US 1 Bypass and Market Street	Bridge On System, STP-5 to 200K, STP-State Flexible, Toll Credit	$1,931,045				$1,931,045	$1,931,045		
20258	Peverly Hill Rd.	Const. new sidewalk and striped bicycle shoulders and associated drainage along Peverly Hill Road.	Congestion Mitigation and Air Quality Program, Non Participating, Towns	$1,260,448				$1,180,329	$441,830	$708,160	$110,458
27690	US 1 By-Pass	Culvert Rehabilitation, US 1 By-Pass over Hodgson Brook Br No 192/106	STP-State Flexible, Bridge On/Off System, Toll Credit		$227,040	$1,522,984		$1,750,024	$1,750,024		
29640	US 1	US Rte 1 Improvements (1 mi.) from Constitution Dr to Wilson Rd and from Ocean Rd to White Cedar Dr	STP-State Flexible, Toll Credit	$141,900	$380,746	$1,209,015	$1,912,730	$3,644,391	$3,644,391		
29781	Woodbury Ave. , Market St., Granite St.	Upgrade 5 existing traffic controllers and interconnects on Woodbury Ave. Market St. and Granite St	Congestion Mitigation and Air Quality Program, Towns	$1,298,000				$1,298,000	$390,542		$907,458
40893	Grafton Road	Study the long-term needs of the Portsmouth Transportation Center	STP-5 to 200K, Toll Credit	$110,000	$170,280			$280,280	$280,280		
PORTSMOUTH Total				$4,741,393	$778,066	$2,732,000	$9,529,526	$17,700,865	$16,054,908	$708,160	$1,017,916
PORTSMOUTH, NH - KITTERY, ME											
15731	US 1 BYPASS	Bridge Replacement, US 1 Bypass over Piscataqua River (Sarah Mildred Long Bridge) (Red List)	Maine, National Highway System, STP-State Flexible, Toll Credit	$14,649,900	$29,013,745	$6,443,395	$6,045,076	$56,152,116	$41,239,832		$14,912,284
16189	I-95	REHABILITATION OF BRIDGE OVER PISCATAQUA RIVER (HIGH LEVEL BRIDGE)	Maine, Turnpike Renewal & Replacement		$12,971,992	$6,154,987	$4,389,649	$23,516,628		$12,461,678	$11,054,949
PORTSMOUTH, NH - KITTERY, ME Total				$14,649,900	$41,985,737	$12,598,382	$10,434,725	$79,668,744	$41,239,832	$12,461,678	$25,967,233
PROGRAM											
ADA	VARIOUS	Upgrades to side walks, curb ramps, and signals to be compliant with ADA laws.	STP-Safety, Toll Credit	$400,000	$400,000	$400,000	$400,000	$1,600,000	$1,600,000		
BRDG-HIB-M	VARIOUS	Maintenance and preservation efforts for High Investment Bridges	STP-State Flexible, Toll Credit	$2,670,000	$2,670,000	$2,920,000	$2,920,000	$11,180,000	$11,180,000		
BRDG-T1/2-N	Tier 1-2 Bridges	Maintenance & preservation of tier 1 & 2 bridges.	STP-State Flexible, Toll Credit	$3,625,000	$3,125,000	$8,125,000	$8,125,000	$23,000,000	$23,000,000		
BRDG-T3/4-N	Tier 3-4 Bridges	Maintenance and preservation of tier 3 & 4 bridges.	STP-State Flexible, Toll Credit	$3,520,000	$3,020,000	$5,220,000	$5,120,000	$16,880,000	$16,880,000		
CBI	VARIOUS	Complex Bridge Inspection (PARENT)	STP-State Flexible, Toll Credit	$250,000	$250,000	$250,000	$250,000	$1,000,000	$1,000,000		
CRDR	VARIOUS	CULVERT REPLACEMENT/REHABILITATION & DRAINAGE REPAIRS (Annual Project)	STP-State Flexible, Toll Credit	$2,500,000	$2,000,000	$1,500,000	$2,000,000	$8,000,000	$8,000,000		
DBE	Disadvantaged Business Enterprise	In-house administration of the FHWA Supportive Program: "DBE Compliance Monitoring" (Annual Program)	STP-DBE	$65,000	$65,000	$65,000	$65,000	$260,000	$260,000		
FLAP	VARIOUS	Improving transportation facilities that access Federal Lands within NH {FLAP}	Forest Highways	$1,444,000	$600,000	$700,000	$700,000	$3,444,000	$3,444,000		
FTA5307	Boston Urbanized Area (UZA)	Boston Urbanized Area (UZA) FTA Section 5307 apportioned funds for NHDOT transit projects.	FTA 5307 Capital and Operating Program, Other	$3,483,910	$3,595,396	$3,710,449	$3,829,183	$14,618,938	$11,695,150		$2,923,788
FTA5309	VARIOUS	Capital bus and bus facilities - FTA Section 5309 Program	FTA 5309 Capital Funding Program - Discretionary, Other	$1,000,000				$1,000,000	$800,000		$200,000

Figure 5.6: Current Transportation Improvement Program (Summary)

Agency/Community | **Fiscal Year** | **Funding Source**

Project #	Route	Scope Summary	Funding Programs	2017	2018	2019	2020	Grand Total	Federal	State	Other
FTA5310	VARIOUS	Capital, Mobility Mgmt, and Operating for Seniors & Individuals w/ Disabilities - FTA 5310 Program	FTA 5310 Capital Program, Other, STP-State Flexible	$5,011,614	$5,171,986	$5,337,490	$5,508,288	$21,029,378	$16,823,502		$4,205,876
FTA5339	VARIOUS	Capital bus and bus facilities - FTA 5339 Program for statewide public transportation	FTA 5339 Bus and Bus Facilities, Other	$3,078,696	$3,177,214	$3,278,885	$3,383,809	$12,918,604	$10,334,883		$2,583,721
GRR	VARIOUS	GUARDRAIL REPLACEMENT [Federal Aid Guardrail Improvement Program] (Annual Project)	NH Highway Fund, STP-State Flexible, Toll Credit	$2,035,000	$2,035,000	$2,035,000	$2,035,000	$8,140,000	$6,919,000	$1,221,000	
HAZMAT	Hazard Material Review	Hazard Material review for post construction obligations.	STP-State Flexible, Toll Credit	$36,300	$48,000	$36,300	$36,300	$156,900	$156,900		
HSIP	VARIOUS	HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)	Highway Safety Improvement Program (HSIP), Toll Credit	$7,552,000	$10,240,723	$9,712,151	$9,909,081	$37,413,955	$37,413,955		
LTAP	Local Techonolgy Assistance Program	Local Techonolgy Assistance Program (LTAP) administered by the Technology Transfer Center @ UNH	Local Tech Assistance Program	$150,000	$150,000	$150,000	$150,000	$600,000	$600,000		
MOBRR	VARIOUS	MUNICIPAL OWNED BRIDGE REHABILITATION & REPLACEMENT PROJECTS (MOBRR PROGRAM)	Bridge Off System, Other	$4,650,000	$4,650,000	$4,625,000	$4,625,000	$18,550,000	$14,840,000		$3,710,000
OJT/SS	OJT/SS	On the Job training for minority and women to reach journeyman status in the construction industry.	STP-DBE	$30,000	$30,000	$30,000	$30,000	$120,000	$120,000		
PAVE-T1-PRE	Tier 1 Interstate	Preservation of Tier 1 pavements.	STP-State Flexible, Toll Credit	$15,125,000	$11,525,000	$11,800,000	$12,650,000	$51,100,000	$51,100,000		
PAVE-T2-MAI	Tier 2 Highways	Maintenance paving of the tier 2 system.	Betterment, STP-State Flexible, Toll Credit	$7,855,000	$12,705,000	$12,725,000	$11,130,000	$44,415,000	$19,415,000	$25,000,000	
PAVE-T2-PRE	Tier 2 Highways	Preservation of Tier 2 pavements.	STP-State Flexible, Toll Credit	$10,525,000	$7,925,000	$8,025,000	$7,925,000	$34,400,000	$34,400,000		
PVMRK	VARIOUS	Statewide Pavement Marking Annual Project	STP-State Flexible, Toll Credit	$3,100,000	$3,100,000	$3,100,000	$3,100,000	$12,400,000	$12,400,000		
RCTRL	VARIOUS	Recreational Trails Fund Act- Projects selected annually	DRED, Recreational Trails	$1,562,500	$1,562,500	$1,562,500	$1,562,500	$6,250,000	$5,000,000		$1,250,000
RRRCS	Statewide Railroad Crossings	RECONSTRUCTION OF CROSSINGS, SIGNALS, & RELATED WORK (Annual Project)	RL - Rail Highway, Toll Credit	$1,160,000	$1,160,000	$1,160,000	$1,160,000	$4,640,000	$4,640,000		
SRTS	VARIOUS	SAFE ROUTES TO SCHOOL PROGRAM	Safe Routes to School	$2,195,700	$443,003			$2,638,703	$2,638,703		
TA	VARIOUS	TRANSPORTATION ALTERNATIVES PROGRAM (TAP)	Other, TAP - Transportation Alternatives	$6,584,000	$6,384,000	$6,384,200	$6,384,200	$25,736,400	$20,589,120		$5,147,280
TRAC	TRansportation And Civil engineering program	Implement and participate in AASHTO TRAC program in local high schools.	STP-State Flexible, Toll Credit	$22,000	$22,000	$22,000	$22,000	$88,000	$88,000		
TRCK-WGHT-SFTY	VARIOUS	Truck weight safety inspection & maintenance program	STP-State Flexible, Toll Credit	$100,000	$100,000	$100,000	$100,000	$400,000	$400,000		
TSMO	Transportation Systems Management and Operations	Statewide Transportation Systems Management and Operations, ITS Technologies, Traveler Info	STP-State Flexible, Toll Credit	$350,000	$350,000	$350,000	$350,000	$1,400,000	$1,400,000		
UBI	VARIOUS	Underwater Bridge Inspection (Annual Project)	STP-State Flexible, Toll Credit	$50,000	$60,000	$60,000	$60,000	$230,000	$230,000		
USSS	VARIOUS	Project to update signing on state system	STP-State Flexible, Toll Credit	$954,000	$530,000	$530,000	$530,000	$2,544,000	$2,544,000		
PROGRAM Total				$91,084,720	$87,094,822	$93,913,975	$94,060,361	$366,153,878	$319,912,214	$26,221,000	$20,020,664
SALEM											
12334	NH 28	Reconstruct Depot Intersection NH28 (Broadway) & NH97 (Main St) Add Turn Lanes on NH28 (MUPCA)	STP-Areas Over 200K, Towns	$877,200	$2,343,053	$2,747,762	$283,569	$6,251,584	$5,001,267		$1,250,317

Figure 5.6: Current Transportation Improvement Program (Summary)

Agency/Community				Fiscal Year					Funding Source		
Project #	**Route**	**Scope Summary**	**Funding Programs**	**2017**	**2018**	**2019**	**2020**	**Grand Total**	**Federal**	**State**	**Other**
SALEM TO MANCHESTER											
10418	I-93	PROGRAMMATIC MITIGATION (CTAP, NHDES Land Protection Program) (PE & ROW Only)	Interstate Maintenance, NH Highway Fund, National Highway System, Toll Credit	$2,916,894	$1,401,455			$4,318,349	$3,937,834	$380,516	
10418T	I-93	CORRIDOR SERVICE PATROL (Salem to Manchester)	National Highway System, Toll Credit	$100,000	$96,492	$99,580	$12,090	$308,162	$308,162		
10418V	I-93	Final design services for PE & ROW	National Highway System, Non Participating, Toll Credit	$967,128				$967,128	$548,297	$418,831	
10418W	I-93	Chloride Reduction Efforts	FHWA Earmarks, National Highway System, Toll Credit	$1,065,024				$1,065,024	$1,065,024		
10418X	I-93	Final Design (PE) and ROW for I-93 Salem to Manchester corridor post September 4, 2014	Non Participating, STP-Areas Over 200K, Toll Credit, Turnpike Program	$54,829	$55,188	$32,936		$142,952	$79,516	$58,791	$4,646
13933A	I-93	Mainline, State Line to Exit 1 NB & SB	STP-State Flexible, Toll Credit			$4,352,455	$11,977,956	$16,330,411	$16,330,411		
14633J	I-93	Exit 1 to Exit 5 - Construct 4th lane northbound and southbound	STP-State Flexible, TIFIA, Toll Credit			$11,216,239	$11,575,159	$22,791,398	$748,509	$22,042,889	
14633P	I-93	CTAP Phase 3; to fund eligible TOD and TDM planning projects within the CTAP RPC Regions.	National Highway System, Toll Credit	$1,509,816				$1,509,816	$1,509,816		
14633R	I-93	DES Land Grant Program	National Highway System, Other	$1,582,584	$849,601	$1,591,728		$4,023,913	$3,219,131		$804,783
14633Z	I-93	Corridor Smart Work Zone	National Highway System, Toll Credit	$349,166				$349,166	$349,166		
14800A	I-93	MAINLINE, EXIT 1-Sta 1130 & NH38 (Salem), BRIDGES 073/063 & 077/063 Both Red List-DEBT SERV 13933D	National Highway System, RZED Subsidy, Toll Credit	$1,415,100	$1,413,207	$1,413,207	$3,047,006	$7,288,520	$5,044,163		$2,244,357
14800E	I-93	I-93 Exit 2 Interchange reconstruction & Pelham Rd - debt service project for 13933E (Salem)	National Highway System, Toll Credit	$11,809,128	$11,459,606	$11,458,869	$8,363,923	$43,091,526	$43,091,526		
14800H	I-93	Final Design Services for PE & ROW - Debt service for 10418V	National Highway System, Non Participating, Toll Credit	$1,990,062	$1,633,094	$1,685,245	$1,269,436	$6,577,837	$6,159,006	$418,831	
SALEM TO MANCHESTER Total				$23,759,730	$16,908,643	$31,850,259	$36,245,570	$108,764,202	$82,390,559	$23,319,858	$3,053,785
SEABROOK - HAMPTON											
15904	NH 1A	Reconstruction of the Red List bridge carrying NH 1A over Hampton River (Br No 235/025)	STP-5 to 200K, Toll Credit	$275,000	$340,560	$234,305		$849,865	$849,865		
STATEWIDE											
15609H	VARIOUS	Statewide Bridge Maintenance, Preservation & Improvements performed by Bridge Maint.	STP-State Flexible, Toll Credit	$4,400,000				$4,400,000	$4,400,000		
15609I	VARIOUS	Statewide Bridge Maintenance, Preservation, & Improvements performed by Bridge Maintenance.	STP-5 to 200K, Toll Credit		$4,400,000			$4,400,000	$4,400,000		
40792	Statewide	2015 STIC Incentive for 1) Mobile Devices and 2) Design-Build documentation	NHDOT Operating Budget, STP-State Flexible, Toll Credit, Other	$137,500				$137,500	$110,000	$27,500	
25198	VARIOUS	To install Road and Weather systems around the State. Date of release for RFP March 31, 2017	STP-State Flexible, Toll Credit	$431,200				$431,200	$431,200		
Statewide Total				$4,968,700	$4,400,000	$0	$0	$9,368,700 #	$9,341,200	$27,500	$0
TRAPEZE SOFTWARE GROUP, INC.											
68069B	VARIOUS	Statewide rideshare database utilizing Trapeze Ridepro software	Congestion Mitigation and Air Quality Program, Turnpike Capital	$43,883	$47,552			$91,436	$73,149	$18,287	
			TIP Total	$179,687,080	$194,421,543	$183,873,708	$189,954,527	$747,856,738	$531,335,585	$157,989,675	$58,611,599

Figure 5.7: Long Range Projects List (Includes projects in the State 10 Year Plan)

Community / Project #	Project Name	Rank	Years Programme	First Year of CON	Cost by Project Phase (Inflated to Year of Programming) OTHER	PE	ROW	CON	Total
Atkinson									
6021001	Hilldale Ave Improvements	77	2038-2040	2040		$122,977	$0	$646,646	$771,663
Atkinson-Hampstead									
6001001	NH 111 Reconstruction	NR	2038-2040	2039		$2,635,230	$0	$11,403,683	$14,040,951
Brentwood									
6055001	North Rd/Prescott Rd. Intersection realignment	66	2037-2038	2038		$28,552	$0	$146,402	$176,992
6055002	NH 111A/ Pickpocket Rd. Intersection realignment	60	2034-2035	2035		$26,475	$0	$135,750	$164,260
Danville									
6113001	Danville NH111A Sidewalks	23	2033-2034	2034		$387,248	$0	$2,647,484	$3,036,765
East Kingston									
6135001	NH 107/Willow Road Sight Distance Improvements	58	2037-2038	2038		$22,842	$0	$117,121	$142,001

Figure 5.7: Long Range Projects List (Includes projects in the State 10 Year Plan)

Community / Project #	Project Name	Rank	Years Programme	First Year of CON	Cost by Project Phase (Inflated to Year of Programming) OTHER	PE	ROW	CON	Total
Epping									
6147001	NH 125 Expansion from NH 27 to NH 87.	TYP	2017-2022	2022		$951,825	$1,086,469	$16,681,607	$18,721,922
6147002	Signalize Lagoon Road Intersection with NH 125	NR	2034-2036	2036		$82,734	$0	$435,035	$519,805
6147003	Rockingham Rail Trail NH 125 Crossing	NR	2037-2039	2039		$107,071	$0	$563,006	$672,116
6147004	Signalize intersection of NH 125 & NH 87	TYP	2017-2020	0		$1,338,813	$613,955		$1,952,768
6147005	NH 125/North River Road Intersection Improvements	NR	2036-2038	2038		$174,014	$0	$915,010	$1,091,062
6147006	Signalize intersection of NH 125 with Lee Hill Road	14	2031-2033	2033		$76,714	$0	$403,383	$482,130
6147007	NH 125 Expansion - NH 87 to Lee Hill Road	64	2034-2036	2036		$826,511	$0	$5,794,672	$6,623,219
6147008	Bridge Replacement, Blake Road over Lamprey River [059/054]	47	2034-2035	2035		$182,014	$0	$933,279	$1,117,329
6147009	Lamprey River Bridge Repair/Replacement	53	2035-2036	2036		$210,412	$0	$1,078,888	$1,291,336
6147010	NH 125 Signal Coordination - Epping	TYP	2022-2025	2025		$94,351	$52,838	$950,628	$1,099,842
Exeter									
6153001	Epping Road Access Management	27	2027-2029	2029		$343,351	$0	$2,407,237	$2,752,618
6153002	Park St. Bridge Replacement	TYP	2022-2022	2022		$665,096	$0	$4,433,976	$5,101,094
6153004	Exeter NH 111 Bike Shoulders	NR	2038-2040	2040		$267,183	$0	$1,404,915	$1,674,138
6153005	NH 88 Shoulders	NR	2037-2039	2039		$529,733	$0	$3,713,962	$4,245,734
6153008	High St./Portsmouth Ave Intersection Improvements	NR	2036-2038	2038		$1,074,886	$0	$7,536,024	$8,612,948
Exeter to Portsmouth									
6001026	NH 108/33 Corridor Study	NR	2029-2029	0	$338,196				$338,196
Exeter-Newfields									
6001002	NH 87 shoulder widening -Exeter-Newfields	NR	2035-2037	2037		$339,374	$0	$1,784,515	$2,125,927

Figure 5.7: Long Range Projects List (Includes projects in the State 10 Year Plan)

Community / Project #	Project Name	Rank	Years Programme	First Year of CON	Cost by Project Phase (Inflated to Year of Programming) OTHER	PE	ROW	CON	Total
Fremont									
6167001	Martin Rd Bridge Replacement	#N/A	2021-2021	2021	$122,214	$12,865		$533,882	$670,982
Hampstead									
6195001	NH 121 Depot Road Intersection Capacity Expansion	11	2033-2034	2034	$80,677	$0		$413,669	$496,380
Hampton									
6197001	Ocean Blvd Reconstruction	TYP	2023-2026	2026	$1,078,134	$416,709		$8,820,176	$10,317,044
6197002	US 1/NH 27 Intersection Improvements	25	2028-2031	2030	$878,489	$900,890		$7,390,904	$9,172,314
6197004	NH 27 Bike Shoulders	NR	2030-2032	2032	$258,083	$264,664		$2,171,306	$2,696,086
6197005	NH 101/US 1 Interchange Reconstruction	2	2027-2029	2029	$659,572	$1,352,782		$5,410,386	$7,424,770
6197006	Reconstuct of Exeter Road	NR	2031-2035	2035	$1,905,583	$1,954,175		$1,686,012	$5,547,805
6197009	Reconstruction of High Street	NR	2031-2034	2033	$2,015,248	$2,132,769		$13,505,085	$17,655,134
6197010	Reconstruction of Winnacunnet Road	NR	2031-2035	2034	$2,102,866	$2,282,248		$11,100,329	$15,487,477
6197011	Reconstruction of Church Street	NR	2031-2036	2036	$264,664	$278,334		$2,401,396	$2,946,430
6197012	Winnacunnet Road Complete Streets	6	2027-2029	2029	$192,951	$13,191		$1,001,059	$1,209,231
Hampton Falls									
6199001	US 1 Intersection & Capacity Improvements	TYP	2018-2034	2034	$579,015	$593,780		$4,871,370	$6,046,199
6199002	US 1 Shoulders	NR	2037-2039	2039	$214,142	$219,602		$1,801,619	$2,237,402
6199003	US 1 Shoulders & Access Management	37	2033-2035	2035	$193,624	$198,561		$1,628,997	$2,023,217
Kensington									
6239001	NH 150/NH107 Intersection Improvements	18	2027-2028	2028	$124,855	$124,855		$1,024,311	$1,276,049

Figure 5.7: Long Range Projects List (Includes projects in the State 10 Year Plan)

Community / Project #	Project Name	Rank	Years Programme	First Year of CON	Cost by Project Phase (Inflated to Year of Programming) OTHER	PE	ROW	CON	Total
Kingston to Salem									
6001029	NH 111 Corridor Study	NR	2027-2027	0	$321,586				$321,586
New Castle-Rye									
6001025	Route 1A/1B Shoulders & Sidewalks	1	2027-2029	2029		$254,503	$260,993	$2,141,184	$2,658,709
Newfields									
6327002	Newfields NH 87 Shoulders & Sidewalks	20	2027-2029	2029		$38,590	$5,277	$338,196	$384,091
6327003	NH 85 Sidewalks	41	2034-2037	2037		$236,012	$124,101	$2,545,307	$2,907,457
6327004	NH 108 Shoulders in Newfields	29	2035-2037	2037		$31,468	$0	$496,403	$529,908
Newington									
6331001	Pease Arboretum Drive Expansion	39	2037-2039	2039		$196,297	$201,302	$1,651,484	$2,051,122
6331002	NH Avenue/Arboretum Drive Improvements	16	2029-2031	2031		$277,456	$0	$1,313,039	$1,592,525
Newton									
6341001	Replace Pond Road Bridge	63	2035-2037	2037		$458,155	$360,209	$2,955,157	$3,775,559
6341002	Newton Rowe's Corner Improvements	TYP	2017-2022	2022		$257,748	$25,000	$1,095,294	$1,380,064

Figure 5.7: Long Range Projects List (Includes projects in the State 10 Year Plan)

Community Project #	Project Name	Rank	Years Programme	First Year of CON	Cost by Project Phase (Inflated to Year of Programming) OTHER	PE	ROW	CON	Total
North Hampton									
6345001	US 1 Capacity Expansion Hampton Town Line to Atlantic Avenue	NR	2035-2038	2037		$1,619,664	$1,660,965	$13,763,075	$17,045,741
6345002	Cedar Road Bridge Replacement	NR	2028-2030	2030		$245,408	$251,666	$2,064,666	$2,563,769
6345003	US 1 Shoulders Glendale Rd to Hobbs Rd	NR	2038-2040	2040		$109,801	$112,601	$739,024	$963,466
6345004	US 1 Intersection improvements (Hobbs Rd, Elm Road in N. Hampton)	28	2031-2033	2033		$529,329	$542,827	$4,453,349	$5,527,537
6345005	US 1 Shoulders Elm Rd to North Road	NR	2038-2040	2040		$87,841	$90,081	$739,024	$918,986
6345006	US 1/North Road (west approach) improvments	10	2032-2032	2032		$416,167	$416,167	$3,329,336	$4,163,702
6345007	US 1 North Rd intersection relocation	21	2031-2033	2033		$517,821	$531,026	$4,356,537	$5,407,417
6345008	US 1 Shoulders North Rd to Lafayette Terrace	NR	2038-2040	2040		$109,801	$112,601	$923,780	$1,148,222
6345009	US 1 Shoulders from North RD to Rye t/l	NR	2038-2040	2040		$484,040	$496,383	$4,072,330	$5,054,794
6345011	US 1 & Atlantic Ave (NH 111) Intersection Capacity Improvements	3	2027-2029	2029		$83,612	$81,787	$838,725	$1,006,153
North Hampton - Greenland									
6001008	NH 151 Shoulders	NR	2031-2033	2033		$278,780	$285,889	$2,345,430	$2,912,132
Plaistow									
6375001	Main Street traffic calming	TYP	2022-2025	2025		$134,787	$75,483	$1,358,040	$1,570,335
6375003	NH 125 Signal Coordination - Plaistow	TYP	2023-2026	2026		$127,907	$71,364	$1,287,876	$1,489,173
6375004	NH 121A/North Ave. Intersection improvements	17	2027-2027	2027		$250,633	$250,633	$2,005,061	$2,508,354

Figure 5.7: Long Range Projects List (Includes projects in the State 10 Year Plan)

Community Project #	Project Name	Rank	Years Programme	First Year of CON	Cost by Project Phase (Inflated to Year of Programming) OTHER	PE	ROW	CON	Total
Portsmouth									
6379001	NH Ave/Corporate Drive intersection signalization	67	2037-2039	2039		$196,297	$201,302	$1,651,484	$2,051,122
6379002	Grafton Drive Capacity Expansion	32	2037-2038	2038		$267,677	$267,677	$2,196,025	$2,733,417
6379003	Corporate Dr/Grafton Drive intersection signalization	56	2037-2039	2039		$249,832	$256,203	$2,101,888	$2,609,962
6379005	Replace Maplewood Ave Culvert over North Mill Pond	71	2035-2037	2037		$195,140	$200,116	$1,641,754	$2,039,048
6379006	Reconstruct US 1 Bypass from Lafayette Rd to Traffic Circle	NR	2027-2030	2030		$1,368,828	$1,403,733	$11,809,887	$14,584,478
6379007	Maplewood Ave RR Crossing upgraded	TYP	2016-2016	2016		$72,564	$72,564	$580,511	$727,655
6379010	Pannaway Manner Noise Barrier	57	2035-2037	2037		$205,321	$210,557	$1,727,411	$2,145,326
6379011	US 1 Capacity Expansion from Constitution Ave to Wilson Rd. and from Ocean Rd to White Cedar Blvd.	TYP	2017-2022	2022		$1,581,800	$3,354,425	$4,746,994	$9,685,241
6379012	Coakley Road Bridge Replacement	33	2028-2029	2029		$28,169	$28,169	$231,095	$289,461
6379013	Bartlett St. Bridge Replacement	51	2033-2035	2035		$55,183	$56,590	$464,264	$578,072
6379015	Cate Street Bridge Replacement	48	2032-2034	2034		$75,524	$77,450	$635,396	$790,403
6379016	Market St. RR Crossing upgrade	TYP	2023-2026	2026		$109,363	$61,245	$1,101,881	$1,274,516
6379018	Pierce Island bridge Replacement	69	2036-2038	2038		$500,291	$513,048	$4,209,047	$5,224,424
6379019	Hampton Branch Rail-trail improvements	TYP	2021-2023	2023		$253,460	$259,923	$2,132,406	$2,647,811
6379020	Reconstruct US 1 Bypass from Traffic Circle to Sarah Long Bridge	NR	2037-2039	2039		$1,354,447	$1,388,986	$11,395,237	$14,140,709
6379021	US 1 Bypass Traffic Circle Improvements	NR	2038-2040	2040		$920,729	$944,208	$7,746,280	$9,613,256
6379023	Maplewood Ave Complete Streets	TYP	2022-2025	2025		$87,611	$49,064	$882,726	$1,021,425
6379024	Spinney Road Sidewalk & Intersection Construction	19	2033-2034	2034		$16,135	$0	$562,590	$580,760
6379025	US Route 1 Sidepath	TYP	2027-2028	2028		$55,491	$0	$5,975,147	$6,032,666

Figure 5.7: Long Range Projects List (Includes projects in the State 10 Year Plan)

Community / Project #	Project Name	Rank	Years Programme	First Year of CON	Cost by Project Phase (Inflated to Year of Programming) OTHER	PE	ROW	CON	Total
Portsmouth Cont.									
6379026	Lower Islington Street Sidewalk	15	2027-2029	2029		$13,873	$0	$350,144	$366,045
6379027	Market St./ Russell St. Intersection	12	2027-2029	2029		$27,746	$0	$1,247,387	$1,277,161
6379028	Upper Islington St. Improvements	26	2031-2032	2032		$383,571	$0	$2,753,468	$3,139,071
6379029	South Street Reconstruction	74	2038-2039	2039		$45,751	$0	$422,254	$470,044
6379030	Banfield Road Improvements	62	2037-2038	2038		$89,226	$0	$1,189,513	$1,280,777
6379031	Junkins Avenue Reconstruction	38	2035-2036	2036		$84,844	$0	$1,305,106	$1,391,986
6379032	Grafton Drive/Aviation Avenue Sidewalk and Shoulder	70	2031-2033	2033		$43,768	$0	$276,171	$321,972
6379033	NH Ave/Exeter St/Manchester Sq. Roundabout	46	2033-2035	2035		$306,857	$0	$1,290,826	$1,599,718
6379034	International Dr/ Manchester Square/ Corporate Dr Sidewalk and Shoulder	68	2031-2033	2033		$43,768	$0	$460,286	$506,087
6379035	Grafton Drive Sidewalk and Shoulder	NR	2034-2035	2035		$660,832	$0	$2,710,734	$3,373,601
Raymond									
6383001	NH102/Blueberry Hill Road Intersection	54	2035-2037	2037		$32,271	$33,094	$339,374	$406,775
6383002	NH 27/Dudley Road Intersection	65	2027-2029	2029		$26,383	$27,056	$277,456	$332,923
6383003	NH 156/Ham Rd/Harriman Hill Road Intersection	59	2034-2036	2036		$31,468	$32,271	$330,935	$396,710
6383004	NH 27/NH 156 Intersection	30	2031-2033	2033		$87,536	$89,768	$920,572	$1,099,909
Region									
6001012	Improvements to ITS/IMS Communications backbone	NR	2034-2036	2036		$570,864	$585,421	$4,802,791	$5,961,112
6001013	Portable VMS for Region	NR	2027-2027	2027		$11,653	$0	$93,225	$106,905
6001014	Coss-border ITS Improvements	42	2032-2033	2033		$94,405	$94,405	$774,495	$965,338
6001015	Bridge Security Video ITS Improvements	72	2037-2039	2039		$328,351	$336,724	$2,762,482	$3,429,595
6001016	ITS Improvements at Park and Rides	45	2037-2038	2038		$144,546	$144,546	$1,185,853	$1,476,983
6001031	I-95/NH 101 Intermodal Facility	NR	2033-2035	2035		$645,413	$0	$6,787,486	$7,434,934

Figure 5.7: Long Range Projects List (Includes projects in the State 10 Year Plan)

Community Project #	Project Name	Rank	Years Programme	First Year of CON	Cost by Project Phase (Inflated to Year of Programming) OTHER	PE	ROW	CON	Total
Rye									
6397001	US 1 Shoulders Breakfast Hill to Portsmouth City Line	34	2030-2032	2032		$361,316	$370,530	$3,039,829	$3,773,707
6397002	US 1 Washington Rd. Intersection capacity imrprovements	22	2037-2039	2039		$128,485	$131,761	$1,080,971	$1,343,257
6397003	US 1 Shoulders from N. Hampton T/L to Breakfast Hill Rd.	35	2032-2034	2034		$188,809	$193,624	$1,588,490	$1,972,957
Sandown									
6405001	Phillips Rd bridge replacement	49	2033-2035	2035		$77,450	$79,425	$570,149	$729,058
6405002	Bridge rehabilitation/replacement on Fremont Rd.	50	2033-2035	2035		$67,768	$69,496	$651,599	$790,898
Seabrook									
6409001	US 1 Capacity iprovements at the Seabrook Rotary	43	2028-2030	2030		$409,013	$419,443	$3,441,109	$4,271,595
6409002	US 1 Capacity Improvements between Walton Rd and Gretchen Rd	44	2028-2030	2030		$392,653	$402,665	$3,303,465	$4,100,813
6409004	US 1 capacity improvements between NH 107 and North Access Road	5	2027-2029	2029		$494,565	$507,176	$4,160,873	$5,164,643
6409005	US 1 Capacity Improvements between the North Acess Rd and the Hampton Falls Town Line	NR	2027-2028	2028		$66,589	$66,589	$546,299	$681,506
6409006	NH 1A Sidewalk in Seabrook	7	2027-2029	2029		$44,948	$46,094	$378,155	$471,226
6409007	Multiple-use pathway on former B&M line from Mass s/l to Seabrook Station	4	2027-2029	2029		$127,352	$130,600	$1,071,439	$1,331,420

Figure 5.7: Long Range Projects List (Includes projects in the State 10 Year Plan)

Community / Project #	Project Name	Rank	Years Programme	First Year of CON	Cost by Project Phase (Inflated to Year of Programming) OTHER	PE	ROW	CON	Total
Seabrook-Hampton									
6001018	Route 1A Evacuation ITS Improvements	8	2027-2027	2027		$296,739	$296,739	$2,373,911	$2,969,416
6001022	Rehabilitate NH 1A Bridge between Hampton & Seabrook	TYP	2017-2026	2024		$2,807,583	$1,105,968	$68,634,455	$72,550,031
Seabrook-Hampton Falls-Hampton									
6001019	East Coast Greenway - Seabrook	24	2027-2028	2028		$761,616	$0	$5,206,914	$5,970,558
South Hampton									
6417001	Whitehall Rd Bridge Replacement	55	2037-2038	2038		$54,606	$54,606	$447,989	$559,239
6417002	Hilldale Ave bridge replacement	40	2032-2034	2034		$113,286	$116,174	$953,094	$1,184,588
Stratham									
6431001	Stratham Town Center/Stratham Circle Improvements	13	2024-2026	2026		$380,667	$390,374	$3,202,631	$3,975,699
6431002	Bike lanes on Squamscott Rd	31	2027-2027	2027		$166,473	$166,473	$1,331,787	$1,666,761
6431003	Signalize NH 108/Bunker Hill Avenue intersection	9	2035-2037	2037		$95,907	$98,353	$806,886	$1,003,183
6431004	Signalize NH 108/Frying Pan Lane intersection	52	2032-2034	2034		$137,453	$140,958	$1,156,421	$1,436,866
6431005	Winnicutt Road Signalization	36	2032-2034	2034		$31,468	$24,203	$248,202	$305,907
	Total Programmed				**$659,781**	**$46,375,078**	**$33,954,838**	**$378,973,291**	**$460,202,868**

6. Implementation Strategies

INTRODUCTION

The implementation of the Long Range Transportation Plan is more than simply the construction of the projects contained within it. Many of the goals identified in Chapter 2 are necessary additions to the local and regional planning process to ensure that all aspects of the transportation system are developed and maintained. Implementation strategies and recommendations are set out on the following pages organized by the eleven Long Range Plan Goals. These include a mix of actions that the MPO, member municipalities and other partners can take to help the region move toward attaining its goals.

MOBILITY

Goal 1 - Mobility

The region's transportation system offers safe, secure, efficient, and reliable access to employment, housing, commerce, services, entertainment, and recreation

Addressing the ability and ease with which individuals and goods can move from place to place has long been a centerpiece of making improvements to the transportation system. The widespread economic expansion after World War II in the United States was facilitated by the addition of interstate highways and the overall increase in the capacity of our roadways to move vehicles. Over the last twenty years, the high economic and social cost of further expansion has necessitated the use of a wider range of strategies to ensure that existing capacity is utilized as effectively and efficiently as possible. There are a variety of ways in which this can be implemented, notably through access management strategies and Intelligent Transportation Systems (ITS) improvements. Access management typically involves small scale policy, regulation, and design changes that minimize traffic conflicts and maximize traffic flow on existing facilities. Strong Access Management standards are recommended for communities to implement on state highways and other important roadways within their jurisdiction. This should be supplemented with an Access Management Memorandum of Understanding (MOU) between the New Hampshire Department of Transportation and the community to ensure that each entity understands the access control desired on a particular state highway.

ITS uses technological advances to improve traffic flow and safety and reduce congestion through strategies like traffic signal synchronization, electronic tolling, and traveler information services. The region has an approved and up-to-date ITS Architecture in place that guides investment strategies through agreed on policies and technology standards.

ACTIONS

- Continue scheduled updates to Regional ITS Architecture and Strategy Plan and participate in updates to Statewide ITS Architecture. (Timeframe: 1-5 years)

- Promote integration of ITS and other efficiency strategies into the design of transportation projects as appropriate. (Timeframe: Ongoing)
- Continue implementation of improvements from corridor studies to address congestion on US 1 and NH 125 (Timeframe: Ongoing)
- Conduct corridor studies of other key congested highways (Timeframe: 1-10 Years):
  - NH 108/33 between Exeter and Portsmouth
  - NH 111 between Kingston & Salem
  - NH 101 Interchanges between Raymond & Hampton
  - NH 125 from NH 111 in Kingston to NH 101 in Epping
- Revisit Congestion Management Process (CMP) as a tool for identifying and tracking congested locations in the region. (Timeframe: 1-5 Years)
- Implement improvement to the Regional Travel Demand Model. (Timeframe: 1-5 Years)

Accessibility & Transportation Choice

Goal 2 – Transportation Choices

The region's transportation system offers equitable and reliable multi-modal transportation choices to better connect people to jobs and services.

Ensuring that all travelers have options beyond the single occupant vehicle is key to meeting the accessibility goals of the region. Beyond simply planning for and providing bicycle and pedestrian facilities and transit services, though, there is a role for the MPO in actively encouraging use of these options. The New Hampshire Climate Action Plan identified the transportation sector as the source of 33 percent of greenhouse gas emissions in New Hampshire, and identified actions for reducing those emissions including promoting alternatives to driving alone. Experience nationally in promoting safe walking and bicycling to school has shown that building new sidewalks or bikeways alone is often not enough to induce more kids walk or bicycle. There is a need for the other four elements of the 5Es model (Education, Encouragement, Enforcement and Evaluation) to build awareness, incentive behavior change and ensure safety.

Actions

- Work to expand transit access in key underserved communities lacking basic Monday-Friday demand response or volunteer driver transportation services. (Timeframe: 1-5 Years)
- Provide technical assistance to COAST, CART and TASC in developing regional community transportation options. (Timeframe: Ongoing)
- Facilitate regional efforts to coordinate public transit and human service transportation as a key strategy to expand access to community transportation. (Timeframe: Ongoing)
- Work with State and regional partners to sustain and expand inter-city rail and bus transportation options. (Timeframe: Ongoing)
- Ensure adequate capacity at Park and Ride facilities in the region (Timeframe: Ongoing)
- Support continued funding for the commuteSMARTseacoast TMA following completion of Spaulding Turnpike widening
- Work with transit agencies, TMAs, and others to expand employment transportation options in the region. (Timeframe: 1-5 Years)

- Evaluate potential for TMA along southern I-93 corridor. (Timeframe: 1-10 Years)
- Work to expand Federal and State funding available for transit services. (Timeframe: Ongoing)
- Collaborate with TMAs and other regional and statewide partners on initiatives to encourage alternative commutes such as Seacoast Bike/Walk to Work Day and Commute Green New Hampshire (Timeframe: Ongoing)
- Develop a stand-alone bicycle and pedestrian plan for the RPC region. (Timeframe: 1-5 years)
- Implement a complete streets policy for the region and corresponding approach for all federally funded transportation projects. (Timeframe: 1-5 Years)
- Expand data collection on bicycle and pedestrian volumes and routes. to provide a better basis for evaluating bicycle and pedestrian project needs. (Timeframe: 1-5 Years)
- Assist communities in implementing bicycle improvements on key regional bicycle and pedestrian routes. (Timeframe: Ongoing)
- Collaborate with regional and statewide partners on public education and enforcement initiatives to promote safe travel on the region's transportation system for all users. (Timeframe: 1-3 years and ongoing)
- Facilitate local Safe Routes to School programs and safety improvements connecting neighborhoods to schools. (Timeframe: 1-10 Years)
- Implement signage and lane marking improvements and standards that aid in wayfinding and improve safety for travelers. (Timeframe: 1-10 Years)
- Develop an assessment of likely implications of autonomous vehicle integration for the region, and local and regional actions needed to prepare for this.

System Preservation & Modernization

Goal 3 – System Preservation & Modernization

The region's transportation system is maintained in good condition and the preservation and modernization needs of existing components are prioritized ahead of adding new highway capacity.

As the condition of roadways and bridge structures declines, the cost of repair rises substantially in both time and funds required. At appropriate funding levels, these structures are addressed prior to declining to the point where extensive and expensive fixes are needed to bring the facility back to good condition. NHDOT has undertaken a two-prong approach to addressing system preservation and modernization needs that differentiates between how roads and bridges are treated.

Bridges & Culverts

As discussed in the existing conditions chapter, NHDOT's Bridge Strategy consists of three components; establishing bridge priorities, making sustainable investments, and assessing the utility of redundant bridges, and this methodology sets the order in which deficient bridges in the region are addressed. In the RPC region, much of the system preservation and modernization discussion has centered around the aging bridges in the region and, in recent years, a number of the most critical and complicated facilities have been replaced or rehabilitated. This has resulted in substantial progress in repairing or replacing the state owned

"Red List" bridges in the region, and some progress reducing the number of municipal bridges that are in poor condition as well. The RPC has also been assessing stream crossings (culverts and bridges) within the region to provide state agencies and municipalities with information to identify critical and hazardous crossings. While not fully completed, the objective is to identify those stream crossings that may fail, particularly during major storm events and to identify if a crossing is a barrier to aquatic organisms, fish and other wildlife movement. Knowing the condition of stream crossings can help guide municipalities prioritize those crossing most in need of retrofit or replacement. Results from this assessment can be incorporated into municipal and regional hazard mitigation plans, vulnerability assessments and site specific restoration and mitigation projects.

Pavement Condition

Similar to the NHDOT Bridge Strategy, the NHDOT Pavement Strategy is based on three concepts: establishing tiers, focuses on sustainable investments, and keeping roads in working order. The pavement strategy differs in that the facilities in the worst condition will be maintained as best as possible, while those in good to fair condition will be maintained in that condition. This is based around the tier system which prioritizes preservation and rehabilitation work on the Interstate Highways, Turnpikes, and major roadway corridors, while the lower tiered state roadways are kept in good working order through maintenance paving. ***Map 3-3*** (Existing Conditions Chapter) shows how the tiered system is applied in the RPC region. NHDOT's short-term paving plan covering calendar years 2017-2019 establishes the initial strategy

ACTIONS

- Complete regional stream crossing condition analysis and provide information to communities and state agencies (Timeframe: 1-5 Years)
- Continue to dedicate resources to reduce the number of Red List bridges in the region. (Timeframe: Ongoing)
- Continue to work with NHDOT to ensure that bridge designs use materials promoting long lifespans and incorporate consideration for bicycle and pedestrian needs, minimize the impacts of natural hazards on the structures, as well as the potential impacts of climate change. (Timeframe: Ongoing)
- Continue to encourage the state and communities to provide adequate resources for bridge and culvert maintenance. (Timeframe: Ongoing)
- Encourage communities to adopt and maintain pavement management systems to track roadway conditions and plan for future maintenance and preservation needs. (Timeframe: Ongoing)
- Continue to encourage the expansion of resources available to maintain all modal elements of the transportation system to keep up with identified needs. (Timeframe: Ongoing)

SAFETY AND SECURITY

Goal 4 – Safety & Security

The region's transportation system is safe and secure for all users.

A primary focus of roadway improvements in the region is improving safety for all users. Based on the information in Existing Conditions (Chapter 3) and the Needs Assessment (Chapter 4), a number of project specific actions have been

identified to address safety and security concerns in the region. In addition, the New Hampshire Strategic Highway Safety Plan and the State Five Percent Report detailing high crash frequency intersections and segments in the region provide areas of focus for crash reduction efforts. While the region is seeing recent growth in the number and rate of crashes per 100 Million VMT, it is unclear if this is a long-term pattern. In either case, a broad focus on transportation safety will begin to address the problem.

There are currently few projects in the region that are designed specifically to address transportation system security concerns. However, ensuring that the network is resilient and adaptive to the impacts of natural and man-made hazards and climate change is a critical aspect of planning for the future of the region. Translating findings from recent vulnerability analyses into specific resiliency projects will be an emphasis for the MPO in the upcoming decade.

ACTIONS

- Work to improve accuracy of crash data. (Timeframe: Ongoing)
- Continue to work with NHDOT on Road Safety Audits and follow-up improvements for crash locations with fatalities and serious injuries. (Timeframe: Ongoing)
- Support the implementation by NHDOT and NHDOS of strategies identified in the Strategic Highway Safety Plan. (Timeframe: 1-5 Years)
- Ensure that safety for all users is included in the design of transportation improvement projects. (Timeframe: Ongoing)
- Ensure that transit stop locations have adequate and safe pedestrian access to adjacent land uses. (Timeframe: Ongoing)
- Work with state and regional partners to reduce distracted driving through a combination of education and enforcement
- Incorporate mandated Federal Performance Targets and metrics into the MPO Long Range Transportation Plan (Timeframe: 1-5 Years)
- Better define the role of safety in the Ten Year Plan project selection process (Timeframe: 1-5 Years)
- Incorporate more substantive safety analysis, including corridor-based crash rates, into any corridor studies conducted in the region to better identify deficiencies and address concerns. (Timeframe: ongoing)
- Work to ensure that the movement of hazardous materials through communities on rail and roadway is conducted in as safe a manner as possible. (Timeframe: Ongoing)
- Undertake a coastal evacuation route capacity and safety analysis. (Timeframe: 1-5 Years)
- Incorporate outcomes of the Regional Stream Crossing Assessment into the MPO Long Range Transportation Plan (Timeframe: 1-5 Years).
- Fully integrate regional vulnerability analyses to sea level rise and storm surge into the Long Range Plan and into the project selection process for the region.
- Work with state and regional partners to define the MPO role in security planning for the transportation system. This role should provide tangible benefits without adding a level of bureaucracy to the security planning process. (Timeframe: 1-5 Years)

- Incorporate transportation network planning into the current work with FEMA and local communities to develop hazard mitigation plans. (Timeframe: Ongoing)
- Analyze the transportation system for capacity and safety deficiencies that impact security and disaster planning concerns, and incorporate security and disaster planning into the project design and prioritization process. (Timeframe: 1-5 Years, Ongoing)
- Implement the recommendations from the 2016 Coastal Risks and Hazards Commission report for incrementally improving coastal infrastructure to increasingly severe storm activity and best available projections for future sea level rise. (Timeframe: 1-10 Years)

LAND USE INTEGRATION

Goal 5 – Land Use Integration

New commercial and residential development supports multiple modes of transportation and minimizes the need for expanding capacity of adjacent roads.

The pattern of land use and the needs of the transportation system are closely linked, and changes to each can have a significant effect on the other. Over time it has become clear that development patterns can strongly influence the growth in travel demand in a region. Regions with compact city centers that have a mix of uses and serve as employment hubs can generate 20-30 percent less automobile travel per capita than regions that are highly sprawled in their pattern. While the RPC region historically was compact in its settlement pattern, with many traditional downtown and village centers that remain active and viable, most of the development that has occurred over the past four decades has been far more dispersed and sprawling in character. This led to growth in the number of vehicle miles travelled at a rate two to three times that of the population growth and was unsustainable in the long term. There was a brief decline in VMT that accompanied the high energy costs and unemployment of the economic downturn. However, starting in 2008, as gas costs have declined and the economy has returned to full employment, VMT is on the rise again at a rate that is much higher than the growth in population.

Despite these rising numbers, market demand for housing in mixed-use downtown areas, together with extensive public input data, point to growing interest in "walkable" communities. As a transportation planning policy this Plan advocates efficient land use strategies which, among other benefits, continue to lower demand for automobile travel and reduce congestion. These strategies are critical mechanisms to maintain healthy air quality, as well preserve and maintain other natural resources, mitigate natural hazards and adapt to a changing climate, as well as minimize land consumption.

ACTIONS

- Promote compact, mixed use development, including Transit Oriented Design (TOD) where appropriate. (Timeframe: Ongoing)
- Prioritize transportation investment in the region's already developed areas through weighting of project selection criteria. (Timeframe: Ongoing)
- Promote development of Access Management standards for state highways in communities, and assist communities and NHDOT with the development of Access Management

agreements to guide project permitting. (Timeframe: 1-10 Years)

- Promote strong Access Management in designs for improvements (publicly and privately financed) along state highways and other corridors. (Timeframe: Immediate and ongoing)
- Encourage communities to conduct rigorous traffic impact analysis as part of development site review. (Timeframe: 1-5 Years, Ongoing)
- Encourage expanded use of the Developments of Regional Impact process to address concerns regarding the impacts of development beyond community boundaries. (Timeframe: 1-5 Years, Ongoing)
- Require the consideration of hazard mitigation and climate adaptation needs in the development of transportation projects. (Timeframe: 1-5 Years, Ongoing)

ENERGY & ENVIRONMENT

Goal 6 – Energy & Environment

The region's transportation system is proactive in protecting natural and historic resources; and is forward looking regarding energy use, energy efficiency and conversion to renewable energy sources.

The interaction of the transportation system with natural and cultural resources and energy use covers a multitude of topic areas and issues of concern to the region. Prominent among these for the MPO for many years has been reducing the impacts of the transportation system on air quality through projects and policies that reduce Vehicle Miles of Travel and promote less polluting modes of travel. While the MPO region is no longer in Non-Attainment for the National Ambient Air Quality Standards, strategies to reduce emissions of air pollutants and greenhouse gases remain a priority. Other work of the MPO under this goal includes improving resource inventories to better understand natural and cultural resources in the region and minimize impacts from new transportation; and conveying that information to project designers and the public to shape project development.

ACTIONS

- Expand natural and cultural resource inventory data to guide project planning and mitigation efforts. (Timeframe: Ongoing)
- Participate in project development to provide information to minimize resource impacts as well as shape mitigation efforts. (Timeframe: Ongoing)
- Continue to track NAAQS criteria pollutant levels in the region and prioritize projects that improve air quality. (Timeframe: Ongoing)
- Complete the stream crossing inventory on the state highway system to identify adverse ecological impacts from undersized culverts. (Timeframe: 1-5 Years)
- Incorporate greenhouse gas emissions into regional performance based planning efforts. (Timeframe: 1-5 Years)
- Promote transportation projects in the region that reduce total Vehicle Miles Traveled. (Timeframe: Ongoing)

RESILIENCY

Goal 7 – Resiliency

The region's transportation system is adaptive and resilient to climate change and natural and other hazards.

Changing weather patterns and the prevalence of extreme storm events in the northeast over the last ten years have focused attention on the vulnerability of the transportation network. Although many local and regional studies have confirmed that our climate may change more rapidly in the future, there is still uncertainty about when and how much it will occur. Tackling the impacts and in some instances positive opportunities that long term climate change pose requires integrating environmental and land use considerations with transportation planning. In order to accomplish this, integration must be a primary driver in the decision-making process supported by translation of sound science, research and analyses into policy and practice. The goal of resilience is to make decisions that ensure systems can respond with less impact and recover from extreme events faster.

The MPO can play a role in conducting the analysis necessary to understand where impacts from natural or other hazards may occur; and working to mitigate that potential where possible. ***Map 4-2*** indicates that over 80 miles of roadways in the seacoast could be impacted by sea level rise and coastal inundation from storms and the region needs to begin addressing and mitigating that issue.

NH Climate Action Plan

The NH Climate Action Plan (2009) recommends statewide actions to address existing and future challenges relating to economics, human health, natural systems, and infrastructure. The report offers guidance that "The state will need to plan for these impacts with the best understanding of the resources that are available to address the issue at the state, regional and national level. This would require more comprehensive and integrated planning with a variety of stakeholders and should begin immediately and continue into the future." Mitigation and adaptation are two of the primary strategies recommended to slow the rate of environmental change and reduce the potentially harmful effects of climate change.

The NH Climate Action Plan is available at https://www.des.nh.gov/organization/divisions/air/tsb/tps/climate/action_plan/nh_climate_action_plan.htm.

NH Coastal Risks and Hazards Commission

The NH Coastal Risks and Hazards Commission (CRHC) was charged with investigating future impacts of climate change and coastal hazards including flooding from increased precipitation, coastal storms and sea-level rise. Completing its work in December 2016, the CRHC issued a final report which is available at http://www.nhcrhc.org/. With respect to state and municipal planning, infrastructure management, land use and development, and environmental protection, the Commission's report offers 35 recommendations relating to the built landscape, natural resources, heritage and economy, and recommends the following general guidelines and principals to guide informed decisions today and in the future.

- Act Early. Responding now to the future threat of coastal flooding will maximize long-term cost savings that result from building a more resilient community.

- Respond Incrementally. Incremental and iterative approaches allow the community to refine and correction actions as information becomes available and conditions change.
- Revisit and Revise. As climate science is refined, periodically revisit climate change projections and assumptions, and adjust actions accordingly.
- Collaborate and Coordinate. To decrease costs and increase effectiveness of planning and preparation, state and local governments need to align policies, plans and responses about future coastal hazards to the greatest extent possible.
- Incorporate Risk Tolerance in Design. Buildings and facilities that are critical to public functions or safety, that are intended to last a very long time or that are expensive to replace, should be considered to have low risk tolerance and should consider future flood and coastal hazard in their design.
- Make No Regrets Decisions. A no regrets policy or approach refers to actions that yield multiples benefits even under the lowest flood or coastal hazard scenario, and should incur low costs or save money over the medium to long term.

The CRHC guidelines could serve as a standard framework for transportation related activities such as long range planning and decision making, maintenance of existing assets and resources, infrastructure siting and design, and investment in existing and future transportation assets and resources to ensure implementation of beneficial climate adaptation and resilience actions.

ACTIONS

- Incorporate impacts from sea-level rise and coastal storm surge flooding identified in the Tides to Storms Vulnerability Assessment (2015, RPC) and Climate Risk in the Seacoast Vulnerability Assessment (2016, RPC, SRPC, NH Coastal Program) into infrastructure management and improvement plans and other local and state policies and regulations. (Timeframe: 1-5 Years)
- Plan for necessary improvements to roadways and their supporting infrastructure to manage additional stormwater runoff from more frequent and extreme storm events, and adapt to long term sea-level rise. (Timeframe: 1-5 Years)
- Assess the impact of freshwater and tidal crossings on adjacent tidal wetlands, aquatic organism passage, and public safety under existing and future climate conditions.
- Implement regulatory standards and/or enact enabling legislation to ensure that the best available climate science and flood risk information are used for the siting and design of new, reconstructed, and rehabilitated state-funded structures and facilities. (Timeframe: 1-5 Years)
- Develop natural resource restoration plans/strategies that explicitly consider future coastal risk and hazards, and the ecological services that they impact.
- Work with state and regional partners to define the MPO role in security planning for the transportation system. This role should provide tangible benefits without adding a level of bureaucracy to the security planning process. (Timeframe: Ongoing)
- Incorporate transportation network planning into the current work with FEMA and local communities to develop hazard mitigation plans. (Timeframe: 5-10 Years)
- Analyze the transportation system for capacity and safety deficiencies that impact security and disaster planning concerns. (Timeframe: 5-10 Years)
- Incorporate security and disaster planning aspects into the project design and prioritization process. (Timeframe: 1-5 Years)

- Prioritize projects designed to increase the resiliency of the transportation system to anticipated impacts of climate change. (Timeframe: Ongoing)
- Coordinate with coastal municipalities on timely implementation of recommendations identified in municipal Natural Hazards Mitigation Plans, and consider impacts identified in the Tides to Storms Vulnerability Assessment and Climate Risk in the Seacoast Vulnerability Assessment. (Timeframe: Immediate and Ongoing)

ECONOMIC VITALITY

Goal 8 – Economic Vitality

Through strategic investment, the region's transportation system supports an innovative and competitive 21st century economy that connects people, goods, and communities to desired activity and economic centers.

Continued economic success in the region will rely upon the efficiency, effectiveness, safety and appeal of the transportation network that connects people and goods for commerce and recreation. Many of the projects included in the Long Range Plan support economic vitality locally or regionally through improved personal or freight mobility; access to employment and basic life needs; enhancing the safety and attractiveness of downtowns, and improvements on key tourism routes.

ACTIONS

- Prioritize projects for funding that are identified as regional infrastructure priorities in the Comprehensive Economic Development Strategy (CEDS). (Timeframe: Ongoing)
- Participate in the development of the New Hampshire State Freight Plan and integrate its recommendations into the Long Range Transportation Plan (Timeframe: 1-5 Years)
- Prioritize investment in rail, the Port of New Hampshire, and connecting transportation infrastructure. (Timeframe: 1-5 Years, Ongoing)
- Increase the capacity for both freight and inter-city passenger travel by constructing double-track on the B&M railway through entire region. (Timeframe: 10-20 Years)
- Implement recommendations from recently completed Scenic Byway Corridor Management Plans to improve wayfinding and visitor information. (Timeframe: 1-10 Years)
- Implement safety improvements along the NH Coastal Byway to accommodate sharing of the road by people driving, bicycling, and walking. (Timeframe: 1-10 Years)
- Undertake a study of tourism-based travel in the region and the transportation improvements necessary to maintain this economic base of the region. (Timeframe: 1-10 Years)
- Implement the recommendations from the 2016 Coastal Risks and Hazards Commission report to incrementally improve the resiliency of NH1A, NH1B and other coastal infrastructure to increasingly severe storm activity and best available projections for future sea level rise. (Timeframe: 1-10 Years)

Public Health

Goal 9 – Public Health

The region's transportation system is designed and built to support safe and healthy communities, facilitate active living opportunities, and aging in place.

Public health is influenced by the transportation system in multiple ways. Examples include something as simple as people's ability to travel to medical appointments, the impacts of vehicle emissions on air quality which affects heart and lung function, and the safety of the transportation system for people traveling by all modes – whether driving, walking, bicycling or riding transit.

A fourth facet of public health impacted by the transportation system is physical activity, and the extent to which our transportation system and communities are built to support active transportation – i.e. walking or bicycling for short trips.

Each of these aspects, and the strategies below, are addressed under other plan goals. However public health is pulled out explicitly as a goal, and the following strategies aggregated here, to underscore the impact transportation investments have on public health and healthcare. While often excluded from measures of economic vitality, these sectors account for over 17% of our economy, and are central to any measure of quality of life.

Actions

- Facilitate development of volunteer driver program capacity or other transit service to provide access to medical care and other basic life needs in underserved communities. (Timeframe: 1-5 Years)
- Facilitate development of local Safe Routes to School programs to enable children to walk/bike to school safely and encourage active transportation. (Timeframe: 1-10 Years, ongoing)
- Support safe accommodation of all travelers in roadway design through an MPO Complete Streets Policy, and assist municipalities in development of local policies. (Timeframe: 1-5 years)
- Encourage communities to implement compact, mixed-use development patterns that facilitate active transportation. (Timeframe: 1-10 Years, Ongoing)
- Assist in planning and implementation of a regional network of multi-use trails as traffic-separated transportation and recreation facilities supporting physical activity. (Timeframe: 1-5 Years, Ongoing)
- Continue to prioritize projects that improve air quality. (Timeframe: Ongoing)

Planning Process

Goal 10 – Efficient & Effective Planning Process

The MPO provides an efficient and effective implementation of the cooperative, coordinated, and continuous (3C) federal transportation planning process that aids in the efficient and effective implementation of projects.

A critical role of the MPO is to establish project priorities for implementation given limited funding for investment in the maintenance, preservation, modernization, and improvement of

transportation infrastructure. Project selection criteria and processes have been used by the MPO for many years to quantify and justify priorities but until recent years criteria were not consistently applied at the state level. In 2012-2013 NHDOT and the MPO developed and utilized a comprehensive process and a common set of criteria based around project benefits and impacts as well as project readiness and support concerns. These criteria were used in the development of the 2017-2026 Ten Year Plan and resulted in five of the region's top ten project priorities being programmed in the statewide Plan.

There is a strong interest in applying this process to project prioritization at the regional and state level for many types of projects across all modes of travel. To facilitate that, this process and the selection criteria need to be further defined and refined to better reflect the need for a strong transportation system across all modes and that reflects local, regional, and state priorities in the implementation of projects in the Ten Year Plan and the Transportation Improvement Program (TIP). Chapter 5 lists the current prioritized list of transportation projects for the region.

Actions

- Work with NHDOT to ensure that project selection criteria are regularly updated to reflect evolving local and regional priorities. (Timeframe: 1-2 Years)
- Refine the project development process through early data collection and scoping to better enable the project selection process with more complete information regarding project proposals. (Timeframe: 1-2 Years)
- Update the list of prioritized projects in the Long Range Transportation Plan to reflect the latest planning assumptions. (Timeframe: 1-2 Years - cyclical)
- Solicit communities, transit providers, and NHDOT for transportation needs over the short and long-term within the region. (Timeframe: 1-2 Years - cyclical)
- Assist communities in developing projects to be constructed through the biennial State Ten Year Plan process. (Timeframe: 1-2 Years - cyclical)
- Assist communities in developing projects to be constructed as part of the Transportation Alternatives and Congestion Mitigation and Air Quality Programs. (Timeframe: 1-2 Years - cyclical)
- Expand the MPO's initial list of federally mandated and SHRP2 performance measures to address regional needs and ensure measures addressing each MPO Goal (Timeframe: 1-5 Years)
- Maintain and expand participation by communities, particularly those lacking planning staff, and other stakeholders in MPO process (Timeframe: Ongoing)

Funding Availability

Goal 11 – Funding Availability

Adequate and predictable funding is available to meet current and future needs for transportation system maintenance, operation and modernization across all modes

One of the biggest challenges facing the state, the region, and communities is maintaining, operating and updating the transportation system in an era of reduced resources and weak political will to invest in infrastructure. Traditionally projects have been advanced to the State Ten Year Plan to be queued for eventual construction. However, given the current financial limitations with respect to state and federal funding, waiting for any individual project to be constructed via that route is likely to

take a minimum of 10 to 15 years, and might be a viable option only for large, long range projects. Even then, funding for maintaining the transportation system has not kept up with the repair and replacement needs of the infrastructure. The municipal and business sectors have a shared interest in working to restore state and federal investment in transportation infrastructure. In addition, communities will benefit from finding alternate means of financing many improvements. This will mean working with citizens, other communities, NH DOT, and private interests to find appropriate mechanisms. In addition, many communities have had success in recent years leveraging private development interests to achieve public transportation improvement goals through the use of development exactions and public/private partnerships.

ACTIONS

- Work with federal, state and regional partners to increase the amount of Federal and State funding available in the region to address project needs. In particular, work to establish a dedicated state funding stream for public transportation. (Timeframe: Immediate and ongoing)
- Work directly with communities to expand the options available for local financing of transportation system maintenance, preservation, and improvement. (Timeframe: Immediate and ongoing)
- Promote the use of public/private partnerships to spur investment in the transportation system where private development goals facilitate achievement of public priorities. (Timeframe: Immediate and Ongoing)
- Assist communities with the development of policies and regulations that aid in securing private development funding appropriate to the level of impact expected on adjacent transportation facilities. (Timeframe: 1-10 Years)
- Work with NH DOT to identify projects that may benefit from non-traditional contracting mechanisms such as design-build to expedite implementation. (Timeframe: 1-5 Years, Ongoing)

PLAN IMPACTS & MITIGATION

Beginning with the enactment of SAFETEA-LU and continuing with the FAST Act, MPO Long Range Transportation Plans are required to address the issue of environmental mitigation with the objective of introducing some forethought into how environmental impacts from major transportation projects in the region will be mitigated. While not intended to identify project specific mitigation requirements or opportunities, the plan must include a generalized discussion of potential mitigation activities and compare transportation plans with available State conservation plans, maps, and inventories.
As we interpret it, the objective is to identify both the types of mitigation that are appropriate to the region and the potential opportunities for mitigation that are present in the region.

APPROPRIATE TYPES OF MITIGATION

Environmental impacts associated with transportation projects include both direct and indirect impacts. Mitigation activities considered will differ depending upon the type of impact, the specific resource affected, as well as the severity and duration of the impact. The following sequential mitigation strategy applies generally to all resources:

1. Avoidance – Alter the project so an impact does not occur
2. Minimization – Modify the project to reduce the severity of the impact
3. Mitigation – Undertake an action to alleviate or offset an impact, or to replace an appropriated resource.

Figure 6.1: Common Resource Impacts and Associated Mitigation Activities for Transportation Projects

RESOURCE	IMPACT	TYPE	DURATION	POTENTIAL MITIGATION
Air Quality	• Emissions from construction activity • Impacts from higher vehicle emissions	Direct and Indirect	Short term (construction); Long term (VMT)	• Dust abatement programs during construction • VMT reduction/demand management activities
Noise	• Noise from construction activity • Noise from facility operation	Direct and indirect	Short term (construction); Long term (VMT)	• Restrict night construction, sound suppression • Retain vegetative buffers • Build sound barriers
Water Quality	• Contamination from stormwater • increase in chloride levels • steam sedimentation	Direct and indirect	Short term (construction); Long term (facility operation)	• Restriction on impervious services/reduced pavement, lane or shoulder width • Stormwater management • Salt application BMPs; Construction BMPs
Wetlands	• Direct filling/destruction from roadway construction • wetland impairment from increase pollution loading • Indirect impact from secondary development	Direct and indirect	Short term (construction); Long term (facility location and operation)	• Avoidance through project design • Increase wetland buffers from constructed areas • Replacement or restoration of impaired wetlands • Permanent protection of threatened wetland and adjacent habitat through acquisition • Improved local planning and zoning
Floodplains	• Loss of flood storage and increased potential for destruction of property through flooding; • Loss of associated riparian habitat	Direct	Long term	• Avoidance through project design • Minimize constructed "footprint" in floodplain • Use elevated structures • Restore lost floodplain in same sub-watershed • Improved local planning and zoning
Archaeol. & Cultural Resources	• Loss of historically or culturally significant structures or features	Direct	Long term	• Avoidance/minimization through project design • Relocation of structures • Preservation by documentation (HABS/HAER)
Prime Farmland	• Direct loss through road construction • Indirect loss from ensuing development	Direct and Indirect	Long term	• Avoidance through project design • Improved local planning and zoning
Species of Concern	• Loss, fragmentation or degradation of habitat and dependent species; • Indirect loss of habitat from secondary development	Direct and Indirect	Long term	• Avoidance through project design/location; • Implement wildlife crossing facilities in design • Protect riparian and wetland buffers; • Replacement habitat acquisition and protection • Improved local planning and zoning

Figure 6.1 shows the most common types of impacts associated with constructed transportation projects in the RPC region in the past, as well as potential actions that have been or could be used to mitigate the impacts.

IDENTIFYING OPPORTUNITIES FOR MITIGATION

Mitigation strategies for most environmental impacts begin with an assessment of existing natural and cultural resources. Several data sources for natural resources exist which can provide detailed information on the location, quality, and extent of discreet natural resource types as map "layers", such as wetlands, aquifers, forest areas by type, and soils. However, there are fewer sources which look at these resource layers in combination and assess the value of different geographical areas based on the presence, quality, and interaction of two or more of these resource layers based on their value as a functioning ecosystem. Data on cultural resources tend to be less comprehensive, as few municipalities have comprehensive historical and cultural resource inventories. Much of the cultural resource inventory data from the past 20 years has been compiled for limited geographic areas as part of regulatory requirements for permitting public infrastructure projects such as highways or utility lines.

The Rockingham Planning Commission has been involved with the development of two sources of natural resource data for the region that provide resource information within a framework of analysis of the co-occurrence of two or more resource layers: the *New Hampshire Natural Services Network*, and the *Land Conservation Plan for New Hampshire's Coastal Watersheds*. The *New Hampshire Wildlife Action Plan* provides another important data set useful in identifying high-value resource areas, and was used in part in the Coastal Land Conservation Plan's co-occurrence data. Both the Wildlife Action Plan and the Natural Services Network contain data at state, regional, and municipal scales and are therefore available for the entire RPC/MPO area.

The Land Conservation Plan contains data for the coastal watershed region of New Hampshire, which includes about three-fifths of the land area of the RPC/MPO.

The two coastal vulnerability assessments completed in the past three years (Tides to Storms, 2015 and Climate Risk in the Seacoast, 2017) identified natural resource impacts from projected sea level rise and storm surge in addition to infrastructure impacts.

We have utilized all of these data sources here to identify opportunities for mitigation projects that involve habitat protection and resource conservation as prescribed in ***Figure 6.1*** for transportation projects that impact water quality, wetlands, floodplains, farmland soils or critical habitat.

Transportation project planners should consult these resources in developing mitigation recommendations for transportation projects in the RPC/MPO area:

- The Natural Services Network includes the following information: Water supply, flood storage, economically important soils, significant wildlife habitat, NH Wildlife Action Plan supporting landscapes, local natural resource inventory data, local land protection priorities, land trust protection priorities, class VI roads, recreation trails, active farms, and tree farms.

- The Land Conservation Plan for Coastal Watersheds contains information on the following resources and systems: forest ecosystems, freshwater ecosystems, irreplaceable coastal and estuarine resources, critical plant and wildlife habitat, and conservation focus areas.

- The NH Wildlife Action Plan: includes the following resource information: NH Wildlife habitat land cover, highest-ranking wildlife habitat by ecological condition, conservation focus areas, and species distribution.

- Cultural and Historic Resource Inventories on file with the NH Division of Historic Resources (NHDHR). Given the requirements of the National Historic Preservation Act of 1966, inventories have been prepared as part of Section 106 reviews for any federally funded or permitted public infrastructure project in the past 30 years. Some municipalities have also taken on comprehensive cultural resource inventories, known in NH as Town Wide Area Forms.

- Coastal Vulnerability Assessments including Tides to Storms (2015) focused on the seven Atlantic coast communities, and Climate Risk in the Seacoasts (C-RiSe, 2017) focused on ten additional communities with frontage on Great Bay or tidal rivers.

In addition to the conventional mitigation strategies identified in ***Figure 6.1***, land use strategies have become increasingly important to mitigate the environmental impacts of transportation projects – especially impact related to induced and secondary growth. These include but are not limited to tools such as districts or ordinances based on identified natural resources areas. Examples include the Conservation Overlay District model ordinance found in the Land Conservation Plan, as well as ordinances as found in *Innovative Land Use Controls: A Handbook*, prepared jointly by the NH Office of Energy and Planning (now the Office of Strategic Initiatives), the NH Department of Environmental Services, and the nine regional planning commissions. Tools in the Handbook include model ordinances on Transfer of Density Rights, The Village Plan Alternative Subdivision, Conservation Subdivisions, Erosion and Sediment Control, and Protection of Wildlife Habitat, among others.

Other mitigation strategies include land-trading programs in which impacts to natural resource areas may be mitigated by the purchase or protection of other high value natural resources areas within a defined geographical region. Examples of such programs include wetland trading programs, transfer of density credit programs, and trading programs for high value, contiguous habitat areas that connects to existing protected areas. It is important to stress that any mitigation activities may involve not only the development community and planning professionals, but also must involve natural resource consultants and local and regional conservation organizations who can assist in the process of formulating successful mitigation strategies.

ENVIRONMENTAL JUSTICE

An important consideration for the 2040 Long Range Transportation Plan is the impact of its elements on minority and low-income populations in the MPO region. Title VI of the 1964 Civil Rights Act prohibits discrimination on the basis of race, color, or ethnic origin in the provision of transportation benefits and in the imposition of adverse impacts.
Building on Title VI, Executive Order 12898 (1994) , requires each federal agency to achieve environmental justice by identifying and addressing any disproportionately high and adverse human health or environmental effects, including interrelated social and economic effects, of its programs, policies, and activities on minority or low income population. Executive Order 12898 defines "minority" as a person who is African American, Hispanic, Asian American, American Indian, or an Alaskan Native. A low-income person means a person whose household income is at or below the federal poverty level. For 2017 the poverty threshold was $24,600 for a family of four.

The USDOT's Final Order to Address Environmental Justice in Minority Populations and Low Income Populations requires transportation programming and planning activities to:

- Include explicit consideration of the effects of transportation decisions on minority and low-income populations.

- Provide meaningful opportunities for public involvement by members of minority and low-income populations.
- Gather, where relevant, appropriate and practical, demographic information (race, color, national origin, and income level) on populations served or affected by transportation decisions.
- Minimize or mitigate any adverse impact on minority or low-income populations.

The Executive Order and Civil Rights Act require this Long Range Transportation Plan to address the needs and concerns of protected communities, both in terms of benefits received and impacts imposed. Procedurally, the MPO is working to address these needs through expanding its public outreach efforts. Substantively, the MPO is working to expand access to transportation for low-income and minority populations.